

Macro-Economic Determinants of Travel and Leisure Sector: A Co-integration Analysis From Turkey

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Abstract

Macro-economic factors have influence on companies in the economy. It is seen that travel and leisure sector firms take less emphasis when they are compared with the other sectors. The study aims to investigate travel and leisure sector firms with macro-economic factors. The data of the study covers the period 2005-2013. Co-integration framework is employed to analyze the data. Inflation, term structure and domestic consumption are detected as significant macro-economic determinants of Travel and Leisure Sector according to Vector Error Correction (VEC) Model and VEC Granger Causality Tests. The results are consisted with the literature. Negative relationship with inflation can indicate counter-cyclical monetary policy. The term structure finding supports the view that maturity premium tends to low around business cycle peaks. Domestic consumption has different coefficient signs which prove the explanation that sometimes consumers turn risk averse and average stock-owning consumer will require high expected returns. The study presents examples of macro-economic relationships and can help individuals who are related to stock market index variations.¹

Keywords: Travel and Leisure sector, Macro-economic determinants, Borsa Istanbul, Co-integration

1. Introduction

Travel and leisure sector consists hospitality firms and the companies that operate wide various business segments. Sevil and polat (2014) examined this sector returns with growth of macro-economic determinants. However the relationships can be different at level. The objective of the study is to determine the effects of macroeconomic determinants of the travel and leisure sector prices in Turkish Stock Market, considering long-run relationship among significant variables and stock market prices.

The literature has a great emphasis on the relationship between macroeconomic variables and stock prices. Performance of hospitality firms' in stock market and their macroeconomic determinants have generated a great deal of interest among studies. However, travel and leisure sector is researched little. Finance theory suggests that stock prices reflect future earnings and dividend expectations. Common stock price changes indicate efficient discounting of new information. Business conditions are observed with the changes in economic activity (Grossman and Shiller, 1981). Returns revert their fundamental values in the long run and example mean reversion in hospitality and several different sectors (Chen et al.: 2007) According to the Chen et al (2013), unemployment rate, oil price growth rate, discount rate and monetary policy explain returns of hotel stocks in Taiwan, China, Hong Kong and Japan. Chen et. al. (2007) showed that expansive monetary periods affect hospitality sector returns in a positive direction. Chen (2012), studying FED policy announcements' surprise component, introduced that only unexpected component affects stocks returns. It is consistent with the efficient market hypothesis. Chen (2007) indicated that higher business performances increase the financial performance of tourism sector.

Turkish stock market has experienced various studies that focus on general market index. Açıklın et al. (2008) evidenced that GDP, foreign exchange rate and current account balance have an influence on Turkish stock market index consistent with relevant literature. Rjoub et al. (2009) tested sector indexes returns of Turkish stock market with money supply, unemployment, real exchange rate, unanticipated inflation and term structure of

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interest rate. The factors formulated into a linear model in the period between 2001 and 2005 in align with Arbitrage Pricing Methodology. It is concluded that the factors other than unemployment showed significant relationships with low explanatory power of overall model. Erbaykal and Okuyan (2007) examined Toda Yamamoto procedure and discovered interest rate and inflation causality to stock prices. Kara et. al. (2012) examined tourism revenues of Turkey with macroeconomic variables. Economic growth, exchange rate and current account balance are found significant determinants.

Yılmaz et. al. (2006) investigated Turkish stock market prices with marco-economic variables and VEC model. Their results demonstrated that interest rate, money supply and balance of trade are significant in explaining stock prices. Co-integration relationships were also presented in the study. Aktaş and Akdağ (2013) examined 2008-2012 period Turkish stock market prices and macro-economic factors. They preferred regression analysis to detect existence and magnitude of the effects. Granger causality tests were also used in order to inquire two-way relationships. Interest rate, consumer price index, exchange rate of USD, consumer confidence index and capacity ratios are considered as significant factors. Erdem et. al. (2005) suggested evidence of volatility spillover from macro-economic variables to Turkish stock market.

Stocks are affected by psychological, political, economic and seasonal factors because of the economic conditions (Albeni and Demir, 2011). Garcia et. al. (2003) documented the economic activities of Spanish culture and leisure sector and stated magnitude and regional differences of the sector. Investigations suggest that stock market determinants are country-specific. Size, integration degree with the world markets and financial liberalization levels of stock markets defines the relationship between stock and macro-economic variables (Muradoğlu et. al.,2000). These different factors increased volatility of Turkish stock market. Understanding influences of macro-economy helps to evaluate policy makers' decisions about Turkish stock market (Demirelli, 2008).

2. Literature Review

There are abundant literatures on the role played by macro-economic determinants in stock market. These researches mostly stress general market indexes and vary with the models used and the country analyzed. Aisyah et. al., (2009) investigated Malaysian stock market from macroeconomic perspective using monetary policies variables via co-integration technique. Exchange rates, reserves and interest rate, industrial production and money supply presented monetary policies variables. They found significant long run impacts in VECM framework.

Mukwembi et. al. (2014) researched stock market turnover and macro-economic factors via Granger Causality, Co-integration and Error Correction Methods (ECM). They analyzed long run equilibrium relationship and found that stock market and macro-economic factors are co-integrated. The study showed that stock prices are determined by macro-economic variables in the long run but not in the short run.

Rahman et. al. (2013) examined consumer industrial production, consumer price index, interest rate and money supply with stock market prices. The study concludes that interest rate is only insignificant variable when dependent variable is stock market index. They stated that consumer price index shows negative relationship while other factors positively correlated.

Flannery and Protopapdakis (2002) articulated that previous researchers mostly detect significant effects of money supply and inflation on equity returns. Their study employed GARCH model with most extensive data set including 17 macro series in order to simultaneously determine impact of macro-economic announcements and showed that money supply and inflation affects stock returns while other series are remain insignificant or relate only to stock market volatility.

Maysami and Koh (2000) studied several economic factors with the help of multivariate co-integration analysis and monthly time series data of Singapore. Their findings suggest that inflation and money supply are not

significant in the co-integration relation. Interest and exchange rates are positively co-integrated Singapore stock market. In spite of absence of established theoretical explanation, these results can be expressed by the fact that Singapore is small and open economy.

Bilson et. al. (2001) identified macro-economic determinants of equity market returns in the emerging market setting due to the fact that emerging economies depend more on domestic factors than developed markets. Money supply, goods prices, real activity and exchange rates are found to be significantly associated with emerging market returns when they are analyzed together with world market returns.

Stock markets of Indonesia, Malaysia, Philippines, Singapore and Thailand were analyzed by Wongbangpo and Sharma (2002). Using VECM and Granger Causality methods, they evidenced short term and long term relationship between GNP, consumer price index, money supply, interest rate and stock prices.

Ayaydın and Dağlı (2012) analyzed macro-economic factors and stock market of developing economies. The panel data consists of money supply, interest rate, inflation, exchange rate, industrial production Standard&Poors 500 index. Their findings depicted that while stock market of low income economies are mostly affected by inflation, money supply is more significant for high income economies. The direction and significance of the factors varies according to the market.

Sayılgan and Süslü (2011) tested inflation, money supply, exchange rate, interest rate, gross domestic product, oil price and Standard&Poors 500 index on stock prices of developing economies. They found positive effects of inflation and exchange rate on stock prices and presents positive impact of oil price for overall economies.

Humpe and Macmillan (2009) compared US and Japanese stock market with aid of co-integration procedure. They discovered one co-integration vector for U.S. and two vectors for Japan economy. Stock prices are negatively related to money supply and positively related to industrial production in Japan. U.S. stock prices are affected positively by industrial production. Inflation and interest rate impacts negatively U.S. stock prices.

Naka et. al. (1998) tested Indian stock market and industrial production index, consumer price index, money supply and money market rate. They discovered three long-term equilibrium relationships. Inflation is the largest negative determinant and industrial production index is largest positive determinant according to the results.

3. Theoretical Background

The fact that stock prices manifest the value of anticipated future profits of firms is accepted notion in the literature. Future profitability of firms can be affected by business cycle conditions. Then, the current value reflects expectations about business cycle (Sadorsky, 2003). Measuring the total return variation explained by a combination of shocks to expected returns helps to determine efficiency or rationality of stock market (Fama, 1990).

The efficient market hypothesis contradicts the view that macro-economic factors have an effect upon stock market. Since it assumes that all the relevant information about the stock prices are fully reflected in the current stock prices and abnormal returns cannot be gained by investors. Theoretical relationship between macro-economic variables and stock market movement can be conceived from present value model (dividend discount model) and arbitrage pricing theory. Long run relationships are submitted by present value model. Arbitrage pricing theory demonstrates short run relationships (Kumar and Puja, 2012).

Fama (1981) attempted to explain anomalous negative relationship between inflation and stock market prices. It is emphasized that real variables are more fundamental determinant of equity value than inflation. However, inflation is proxying the positive relationship of real variables and stock returns according to proxy effect hypothesis. Money demand theory and quantity theory of money explain these relationships. The theories suggest that higher future real activity growth is associated with lower current inflation rates. In the theory of

finance, the fundamental determination of equity values arises from the expected rate of returns of available investments in excess of the cost of capital. Negative stock return-inflation correlations are caused by negative relationships between inflation and real activity. Expected inflation can be represented by current inflation in empirical studies (Athanasoglu et. al., 2005).

The positive relationship between stock return and real activity relations is tend to be stable over time especially for well-developed capital markets. However, the relationship between inflation and real activity changes in order to monetary sector equilibrium. If a country is implementing counter-cyclical monetary policy, the relationship is likely to be negative. Otherwise, when the monetary policy is pro-cyclical the relationship could be insignificant or even positive (Kaul: 1987). Cooper (1974) argued that the quantity theory of money has run an important role in determining the relationship between the money supply and various other macro-economic factors. If the supply of money steps up more than normal, individual portfolio decisions can shift from money to other assets because of inflation. Thus, the assets other than fixed income assets and money become preferable. The efficient market hypothesis and the quantity theory of money seem to be contradictory but they can be complementary. The anticipations of the effect of future money supply could be reflected in stock prices.

The link between monetary conditions and stock market, indicates the importance of money supply as factor of stock prices. Money supply is also general indicator of economic expectations. Dividends, riskless rate of interest and risk premium are the factors that determine stock prices, and they are related to money supply. According to the demand of money, a drop of money supply will increase interest rates and decrease interest sensitive expenditures like capital investment of firms. Thus, sales and earnings diminish and price of common stocks will fall with the reduction of dividends. A monetary tightness can raise market interest rates and discount rates. Risk premium also can be affected by increasing uncertainty of monetary tightness. Money supply affects positively the dividends and negatively impact risk premium and riskless rate of interest. However, average level of stock prices will be positively affected by money supply (Homa and Jaffe: 1971).

Breed (1979) is developed intertemporal capital asset pricing model that uses aggregate consumption. Asset betas are calculated relative the changes in the aggregate real consumption rate. Consumption is accepted to be very useful indicator of asset pricing and employed in consumption based Capital Asset Pricing Model. It is stated that changes in the expected real return of investors correlates with real consumption expenditure of the investor (Stulz, 1981). Following this concept, consumption beta model can even value foreign assets (Karolyi and Stulz, 2003).

Household consumption is a function of income and asset values. In some developed countries like USA and UK, domestic consumption becomes major contributor of economic growth. Stock indexes comprise the largest firms in the country. They likely to account for aggregate value created in a country (Duca, 2007). Trend deviations in wealth are found to be strong determinant of raw and excess stock returns (Lettau ve Ludvigson: 2001). It is suggested that consumption-wealth ratio is the key for understanding equity premium and stock price predictability. When consumption is reduced due to recessions, consumers turn risk averse and average stock-owning consumer will require high expected returns. Thus, the prices stay temporarily low (Hamburg et. al., 2008).

GNP can represent the state of overall economy. Considering dividend discount model, Mahdavi and Sohrabian (1991) pointed that GNP directly affects price of corporate equities or stocks with changing expected rate of growth of real after-tax corporate earnings and expected level of real after-tax earnings in the current period. Hypothesized that market premium negatively correlates with recent GNP growth and positively relates with future expected GNP growth. They also stated that term structure of interest rates is related to future growth rates of GNP and consumption because of the fact that if the expectations of future output are high, individuals try to smooth their consumption by rising interest rates (Chen, 1991).

Chen et. al. (1986) demonstrated a variable that indicates difference between long term and short term debt securities. This variable is called the term structure. The term structure captures the impact of changes in risk

aversion. It particularly explains the prices of long term asset with positive slope and can compensate discount-rate risk. The factor defines the maturity premium and tends to low around business cycle peaks. The relationship can be explained by the story that when income is low, returns of stock must be high to induce substitution from consumption to investment. When the income is rising, market starts to prefer lower returns (Fama and French, 1989).

4. Data and Methodology

Time series of relevant variables are produced and Travel and leisure sector in Turkey is examined with macro-economic variables. In the study quarterly data of 2005-2013 periods is used. Datastream classification of travel and leisure sector is employed to identify the industry. The industry includes sport movie theaters, airline companies, resort & thermal hotels and sport clubs. A price weighted index (IND) is created. This variable presents the average stock prices. This computed index and chosen macro-economic factors are analyzed. The macro-economic factors of our study are chosen according to a previous work of Barrows and Naka (Barrows and Naka: 1994). These macro-economic factors are obtained from electronic data delivery system of Central Bank of Turkey's.

Expected inflation (INF) is proxied by current inflation which is calculated from consumer price index. GNP indicates seasonally adjusted final consumption expenditure. Domestic consumption (CONS) shows household consumption, Money supply (M1) is the measure of money stock which includes the liquid and other components. Terms structure of interest rates (TERM) is the difference between long term average interest rate of deposits and short term average interest rate of deposits. We intended to implement a co-integration framework. Since, co-integration consists with three fundamental stock market assumptions. Firstly, stock market activity explains future economic activity. Co-integration indicates predictable relationships between stock prices, cash flows and macro-economic factors. Secondly, stock market is more volatile than underlying macro-economic variables. Owing to the fact that volatility is a function shocks in the economy, the effect will be greater if co-integration exists. Lastly, economic activity explains more variation of stock market in the long run. Relationships are stronger over longer horizons (Nasseh and Straus, 2000).

Table 1: Descriptive Statistics

Descriptive Statistics	Mean	Standard Deviation	Skewness	Kurtosis	Jarque-Bera	Unit Root Test (Level) P-value	Unit Root Test (1 st difference) P-value
IND	10.54041	5.100490	1.059706	3.138460	6.766619	0.8515	0.0045***
M1	1.11E+08	52815177	0.516124	2.322331	2.287160	0.9848	0.0000***
INF	0.083042	0.017254	-0.248099	2.522655	0.711106	0.4319	0.0002***
GNP	25575706	2638479.	0.314120	1.968285	2.188681	0.6163	0.0003***
CONS	1.88E+08	52991919	0.358463	1.926265	2.500335	0.8135	0.0000***
Term	0.841019	0.929753	-0.242859	2.077329	1.630864	0.3176	0.0001***

*Significant at % 10.

**Significant at % 5.

***Significant at % 1.

Descriptive statistics are presented in Table 1. Unit root tests are carried out. Only first difference stationary variables ($I=1$) are suitable for co-integration framework. Test results demonstrate that all variables are non-stationary at level. However, they become stationary after first differentiation. They can be evaluated at co-integration analysis. The methodology of the study is testing co-integration and, if it exists, estimating VEC Model. Later, VEC Granger Causality will be determined.

5. Results

The results of Co-integrations tests are presented in Table 2. Trace test are considered in order to determine co-integrating equations. It can be implied that macro-economic factors and travel leisure index returns have relationship in long term. This result is in line with existing theory and literature. Since the hypothesis of at most four co-integrating equations cannot be rejected, the existences of four co-integrating equations are discovered by analysis. This information helps to construct VEC model.

Table 2: Co-integration Tests

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	p-value
None *	0.916346	192.5651	95.75366	0.0000
At most 1 *	0.772328	110.6899	69.81889	0.0000
At most 2 *	0.588471	61.85479	47.85613	0.0014
At most 3 *	0.444585	32.55488	29.79707	0.0235
At most 4	0.324268	13.14954	15.49471	0.1094
At most 5	0.006491	0.214904	3.841466	0.6429

Trace test indicates 4 cointegrating equation(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

The VEC model is applied after trace test analysis is conducted. Coefficients, t-statistics and p-values are reported. The results of the VEC model are demonstrated in Table 3. Table 3 explains significance of macro-economic factors when travel and leisure index become dependent variable.

The lagged values of macro-economic factors and lagged travel and leisure index are analyzed. The model also exhibits co-integrated equation coefficients and their significance. Values marked with an asterisk display that there is a significant relationship. The first lag of inflation shows significance at % 10, while the second lag coefficient becomes insignificant. The term structure is % 5 significant at first lag and insignificant at second lag.

First and second lags of the GNP do not have significant coefficient. Insignificant coefficients are also exist for the money supply (M1). Both first lag and second lag of the consumption factor is significant. The first lag represents significance at %5 level and the second lag represents significance at %10 level. Thus the results of the VEC Model demonstrates that there are significant relationships, it can be realized that macro-economic factors can affect travel and leisure sector index.

The model also identified the signs of significant coefficients. Inflation, term structure and consumption factors have negative sign at first lag. However, coefficients of inflation and consumption turn positive at second lag. Since the academic researches put forward negative and positive relationships, the results do not contradict with the literature.

Table 3: Vector Error Correction Model Results

Error Correction: Dependent: D(IND)

	Coefficient 1 st lag	Coefficient 2 st lag	t-statistics 1 st lag	t-statistics 2 st lag	p-value 1 st lag	p-value 2 st lag
D(IND)	0.224095	0.459280	[1.10095]	[1.65745]	0.2737	0.1007
D(INF)	-53.97080	50.31987	[-1.72370]	[1.52497]	0.0880*	0.1306
D(Term)	-2.747685	-0.534166	[-2.41094]	[-0.56640]	0.0178**	0.5724
D(GNP)	-1.11E-07	-2.52E-07	[-0.11597]	[-0.32976]	0.9079	0.7423
D(M1)	-1.33E-07	-4.74E-09	[-1.62314]	[-0.06168]	0.1078	0.9509
D(Cons)	-1.91E-07	1.18E-07	[-2.28295]	[1.66305]	0.0246**	0.0996*
Cointegrated equation 1	Coefficient t-statistics p-value -0.284419 [-2.67674] 0.0087***			R-squared	0.689771	
Cointegrated equation 2	Coefficient t-statistics p-value -43.07396 [-0.72962] 0.4674			Adj. R-squared	0.379542	
Cointegrated equation 3	Coefficient t-statistics p-value 1.789439 [2.45429] 0.0159**			Sum sq. resids		
Cointegrated equation 4	Coefficient t-statistics p-value 1.81E-07 [0.32083] 0.7490			S.E. equation	44.77967	
C	Coefficient t-statistics p-value 1.215238 [1.27197] 0.2065			F-statistic	1.672940	
				Log likelihood	2.223425	
				Akaike AIC	-51.86154	
				Schwarz SC		
				Mean dependent	4.173427	
				S.D. dependent	4.944355	
					0.066200	
					2.123852	

*Significant at % 10.
 **Significant at % 5.
 ***Significant at % 1.

Short term predictability can be important for understanding the effects of macro-economic factors. Granger causality explains these effects. The results of granger causality explains only short term variations. Tests are implemented at VEC framework and the results displayed at table 4. Significant p-values are detected at %5 level. Inflation, term structure and consumption are significant causality factors.

Table 4: VEC Granger Causality Tests

VEC Granger Causality/Block Exogeneity Wald Tests

Dependent variable: D(IND)

Excluded	Chi-sq	df	p-value
D(INF)	8.613337	2	0.0135**
D(TERM)	7.312869	2	0.0258**
D(GNP)	0.134009	2	0.9352
D(M1)	4.513967	2	0.1047
D(CONS)	8.942525	2	0.0114**
All	22.72924	10	0.0118**

***Significant at % 10.**

****Significant at % 5.**

*****Significant at % 1.**

Travel and leisure sector index can be predicted by macro-economic variables. When all factors are combined there is also significant granger causality. Granger causality results prove the usefulness of macro-economic factors on the predicting values of travel and leisure sector index. This result is similar with the previous VEC coefficient interpretations.

6. Conclusion

Numbers of the researches which examine leisure sector in Turkey are not sufficient. Our analysis demonstrates an important aspect for leisure sector index. Economic factors are determined and beneficial factors are detected for the industry. Co-integration framework presents important information about our research. It explains the relationship between the sector and macro-economic factors both for short and long term conditions.

The study manifests co-integration relationships according to the trace test. This finding explains the long term aspect. When someone prefers analyzing macro-economic determinants of travel and leisure sector, long term relationships should be considered. Since, 4 co-integrating equations are found different structures should be inquired by who analyze these factors.

The VEC model is estimated by using co-integrated equations and significance of lagged factors are presented by noting p-values. The inflations has first lag negative and significant coefficient. This supports the idea of proxy effect which is explained by Fama (1981). It can be also indication of monetary policy. Kaul (1987) state that a country is implementing counter-cyclical monetary policy, the relationship is likely to be negative.

The term structure have negative and significant coefficient at first lag according to the VEC model. Fama and French (1989) put forward that the term structure factor defines the maturity premium and tends to low around business cycle peaks. The analysis results are in line with this finding.

The coefficients of household consumption are significant. However, first lag coefficient is negative and second lag coefficient is positive. This result can be explained by the opinion of Hamburg et. al. (2008). Sometimes consumers become risk averse and average stock-owning consumer will require high expected returns. Thus, the prices stay temporarily low.

In the study, short term effects are also identified by granger causality tests. Inflation, term structure and household consumption become important predictors of travel and leisure index. Granger causality tests support our VEC model explanations. We can conclude that macro-economic factors are practicable in short term as well as in long term. The study can help who benefits from travel and leisure index variations. Investors can predict the index so that positive returns are maintained. Managers can conduct firm decisions that are influenced by the index.

The study investigates travel and leisure sector. Therefore results demonstrate sector-specific effects. The relationships can change when other sectors are analyzed. The results are important because of the fact that the demand in the travel and leisure sector might be dependent to economic conditions. The findings of the study support this opinion. Stock market traders should take into account macro-economic factors in their travel and leisure sector investments. Travel and leisure sector of Turkey is greater in magnitude. However, a small portion of this sector goes into stock exchange. The information about the prices of travel and leisure stocks helps to understand these investments and can increase stock market listings and transactions.

Detailed examination of the macro-economic determinants of travel and leisure sector index may be the concern of future research investigations. There are also plenty of macro-economic factors. Some of these factors may be in correlation with travel and leisure sector. Therefore, macro-economic variables can be extended in future empirical investigations. For instance, exchange rates might be potential economic determinant that affect travel and leisure sector.

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