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CASH CONVERSION CYCLE, CASH MANAGEMENT AND PROFITABILITY: AN EMPIRICAL STUDY ON THE ISE TRADED COMPANIES

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Abstract

This paper investigates the relationship of cash conversion cycle, a tool in working capital management, with profitability, liquidity and debt structure. The data covering the period of 1995-2000, of 167 firms whose stocks are listed on the Istanbul Stock Exchange (ISE). The cash conversion cycle, profitability, liquidity and debt structure were examined comparatively in this study on the basis of period, industry and firm size. It was examined that the relationships of these variables and the impact of the cash conversion cycle, liquidity and debt structure on the profitability of the company. The findings of our study suggest that cash conversion cycle is positively related to liquidity ratios and negatively related to return on asset and return on equity. High leverage ratio affects adversely the liquidity and profitability of the company. There is no statistically significant relationship between the cash conversion cycle and the leverage ratio. There is no significant difference in the cash conversion cycle on the basis of period, but it differs on the basis of sector and firm size.

I. Introduction

Today, companies are operating in a competitive world of business. The factors, which enhance competitive advantage, are limited under these competitive conditions. Use of efficient working capital management as a tool by the financial manager who make financing and investment decisions on behalf of

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stockholders can create a significant impact on the competitive advantage and the firm value.

Working capital management affects both the profitability of firm and liquidity. Smith (1980) emphasized the effect of working capital management on the liquidity and profitability. He stated that the financial decisions, which have tried to maximize the profitability, could cause inadequate liquidity. On the other hand, just focusing entirely on the liquidity might cause a decrease in the profitability of the company (Shin, Soenen, 1998).

One of the main principles of finance is to collect money as soon as possible and to make payment as late as possible. Cash management is generally based on the cash conversion cycle. The cash conversion cycle is the length of time from the payment for the purchase of raw materials to manufacture a product until the collection of accounts receivable associated with the sale of the product (Besley, Brigham, 2000). Cash conversion cycle is calculated by subtracting the payment deferral period made to suppliers from the sum of inventory conversion period and receivables collection period. The company can raise its sales implementing a generous credit policy. This extends the cash conversion cycle and may increase the profitability. But in the conventional theory, long cash conversion cycle causes a reduction in the profitability of the company (Shin, 1998). The components of the cash conversion cycle formula the inventory conversion period, receivables collection period and payment deferral period have an impact on the liquidity position of the company.

In addition to the competitive conditions that the companies face in domestic and foreign markets, especially under recent economic crisis environment, the importance of the cash management and the liquidity control is increased. The companies can survive in economic recessions by minimizing or postponing the long-term investments, but they may have to stop all their operations if they do not pay attention to working capital management.

The primary purpose of the study is to investigate the working capital management efficiency of Turkish companies. To achieve our aim, the relationship of the cash conversion cycle with the liquidity, profitability and debt structure of the company was observed and the effect of the cash conversion cycle on the profitability of the company was measured. Additionally, it was examined whether the cash conversion cycle, liquidity, profitability and debt structure vary on the basis of sector, period and firm size. A substantial amount of research has been done on the cash conversion cycle especially in the U.S.A.; but the literature on the value relevance of cash conversion cycle in Turkish firms is limited and it is found that studies were conducted generally on the liquidity and debt structure in the working capital management. Especially in

the recent periods, there is a need to investigate the working capital management of the companies in the environment where the companies are operating with high financing expenses.

Liquidity position of the companies is generally measured with the current ratio and quick ratio; however, it is discussed in finance literature that these ratios are static and it is more appropriate to use the cash conversion cycle as a dynamic measurement tool. Gitman (1974) stated that the cash conversion cycle had an important role in working capital management. Richards and Laughlin (1980) recommended the use of cash conversion cycle as a liquidity measurement tool instead of the liquidity ratios.

Belt (1985) examined U.S. companies' cash conversion cycle during the period of 1950-1983. He found that both wholesaling and retailing companies had shorter cash conversion cycle than manufacturing companies. Besley and Meyer (1987) examined the interrelationships among the working capital accounts and the cash conversion cycle, the industry of the company and the rate of inflation. The results demonstrate that the correlation between the cash conversion cycle and the average age of inventory, the most important input to the cash conversion cycle. The cash conversion cycle differed due to industry classification but did not vary from year to year. Additionally, there was no correlation between the cash conversion cycle and the rate of inflation. Kamath (1989) tested the relation between the cash conversion cycle and other liquidity ratios (current and quick ratios). The relationship between current and quick ratios and cash conversion cycle is negative and there is no negative relationship between current and quick ratios and profitability. Also, it is suggested to use all three tools together in measurement of the working capital management efficiency.

Gentry, Vaidyanathan and Lee (1990) developed the weighted cash conversion cycle. Weighted cash conversion cycle is calculated adding the weighted number of days that funds are tied up in receivables, inventory and payables and subtracting the weighted number of days cash payments deferred to suppliers.

Lyrouidi and Mc Carty (1993) examined the relationship among the cash conversion cycle and current and quick ratios for the small U.S. companies. The results of the study indicate that cash conversion cycle is negatively related to current ratio, the inventory conversion period and the payables deferral period, but positively related to the receivables collection period. Additionally, the results show that cash conversion cycle differs within industry (wholesaling, manufacturing, retailing and service). Moss and Stine (1993) investigated the cash conversion cycle of the U.S. retailing companies on the basis of firm size.

The results indicate that large companies have shorter cash conversion cycle, therefore small companies must give more importance to the cash conversion cycle.

Shin and Soenen (2000) introduced the net trade cycle concept as an alternative to cash conversion cycle. In their study they examined the efficient working capital and the profitability of the company. They found a negative relationship between net trade cycle and the profitability. In addition to this, they showed that shorter net trade cycle provides higher stock return.

Lyroudi and Lazaridu (2000) used the cash conversion cycle in their study on Greek companies in the food industry as a liquidity indicator and they investigated the relationship among cash conversion cycle, current ratio and quick ratio. They examined the implications of cash conversion cycle on the profitability, debt structure and firm size. They pointed out cash conversion cycle is positively related to the current ratio, quick ratio and profitability. There is no relationship between cash conversion cycle and the leverage ratio. Current ratio, quick ratio and debt/equity ratios have negative relationship and times interest earned ratio have a positive relationship. Finally, there is no significant difference between liquidity ratios of large and small firms.

II. Research Methodology

2.1. Variables

Cash Conversion Cycle

The main variable of the study is cash conversion cycle. The cash conversion cycle was calculated for each company in the six-year period.

Cash conversion cycle is calculated in finance literature using the following formula;

$$\text{Cash Conversion Cycle} = \text{Inventory Conversion Period} + \text{Receivables Collection Period} - \text{Payment Deferral Period}$$

The components used in the cash conversion cycle;

$$\text{Inventory Conversion Period} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

$$\text{Receivables Collection Period} = \frac{\text{Accounts Receivable}}{(\text{Total Sales}/360)}$$

$$\text{Payables Deferral Period} = \frac{(\text{Short-term Liabilities} + \text{Long-term Liabilities})}{(\text{Cost of Goods Sold} / 360)}$$

Inventory Conversion Period and Receivables Collection Period, the components used in the calculation of Cash Conversion Cycle were taken from ISE sources. Payables Deferral Period was calculated by using the Balance Sheets and Income Statements of analyzed companies.

Shorter cash conversion cycle indicates that the sales are converted into cash in a shorter period.

The other components whose relations with Cash Conversion Cycle was examined in the study are;

Liquidity Ratios

$$\text{Current Ratio} = \frac{\text{Total Current Assets}}{\text{Total Current Liabilities}}$$

$$\text{Quick Ratio} = \frac{\text{Total Current Assets} - \text{Inventory} - \text{Other Current Assets}}{\text{Total Short-term Liabilities}}$$

Profitability Ratios

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Net Sales}}$$

$$\text{Return on Assets} = \frac{\text{Net Profit}}{\text{Total Assets}}$$

$$\text{Return on Equity} = \frac{\text{Net Profit}}{\text{Equity}}$$

Debt Ratio

$$\text{Leverage Ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

In the study, regression analysis, correlation analysis and comparative analysis are applied on the basis of two sub-periods, industry and firm size, by using the variables explained above. The t-test of the sample means was used in comparative analysis, the relationships were investigated with Pearson Correlation Analysis and the effect of cash conversion cycle, liquidity and debt structure on the profitability of the company was measured by regression analysis. A model was formed for the regression analysis.

Model:

$$NPM = \alpha + \beta_1 CCC + \beta_2 CR + \beta_3 QR + \beta_4 LR \quad (1)$$

$$ROA = \alpha + \beta_1 CC + \beta_2 CR + \beta_3 QR + \beta_4 LR \quad (2)$$

$$ROE = \alpha + \beta_1 CCC + \beta_2 CR + \beta_3 QR + \beta_4 LR \quad (3)$$

Profitability ratios are dependent variables in all models. These profitability ratios are NPM = Net profit margin, ROA = Return on assets and ROE = Return on equity. Independent variables in all models are CCC = Cash conversion cycle, CR = Current ratio, QR = Quick ratio and LR = Leverage ratio.

The data of this study was analyzed by using the SPSS Program.

2.2. Sample and Data Collection Method

The study sample consists of companies whose stocks are listed on the ISE, excluding holding companies and companies in the finance sector. The 167 sample companies' balance sheets and income statements for the period of 1995-2000 were used and the data was gathered from ISE's sources. Following this, a database was formed.

III. Findings

3.1. Descriptive Statistics

In the study, there are statistics that describe the companies on the basis of investigated variables. As it is presented in Table 1, the mean value of cash conversion cycle is 78,83 days. Current ratio is 1,71 and quick ratio is 1,08. The profitability of sample companies was measured by three different ratios. The mean value of net profit margin is 4,71, but the standard deviation was found high because the companies are not homogenous, more than one period was examined and the economic conditions faced by the firms in the study period. The mean value of return on equity of the sample is 14,11 and the mean value of return on assets is 7,56. The mean value of the leverage ratio was found as 55,45 %.

3.2. The Results of Analysis

3.2.1. Comparative Analysis

The research method consists of several comparisons. Firstly, it was investigated whether the cash conversion cycle, liquidity, profitability and leverage ratios of the companies differed on the basis of economic period, industry and the firm size. Due to economic conditions the differences between the periods were examined. The research period was divided into two sub-periods. The companies in Turkey operated with high profit margins and showed good performance during 1995, 1996 and 1997 years. Then they faced economic recession during the following three-year period (Yücel, 2001). To determine whether there is any difference between two sub-periods, an analysis was conducted. The liquidity, profitability and debt structure were investigated for these two sub-periods. It was found that the mean value of cash conversion cycle did not indicate a significant difference between two sub-periods. But current ratio (1,81, 1,61, p= .000), liquidity ratio (1,13; 1,03, p=.012), net profit margin (10,16; -0,73, p=.000), return on assets (12,45; 2,67, p=.000) and return on equity (24,57; 3,62; p=.000) decreased and the leverage ratio (52,75; 58,05; p=.000) increased. In summary, the cash conversion cycle did not vary; liquidity and profitability ratios decreased and debt ratios of the companies increased in the recession period.

On the basis of industry, sample companies were categorized into two main industries: manufacturing and service-other sectors. The findings of our study suggested that (Annex Table 3) the cash conversion cycle of the manufacturing industry is longer than the service-other industries (92,06; -2,45, p=.000). Negative cash conversion cycle is not generally common in the manufacturing companies. A negative cash conversion cycle can be realized when these companies have longer payable deferral period than the sum of inventory conversion period and receivables collection period. Mostly the service sector companies have negative cash conversion cycles because these companies have higher inventory turnover and they can collect cash for their services (Gitman 2000). The result for the sample companies of this study is consistent with the theory. While manufacturing companies have positive cash conversion cycle, service companies have negative cash conversion cycle. Current ratio is higher in the manufacturing sector (1,75; 1,41, p=.000). There is an indication that liquidity of the manufacturing companies is higher on the basis of current ratio. There is no statistically significant difference between the industries on the basis of liquidity ratios, net profit margin, return on assets and return on equity. In addition, the mean value of leverage ratio of the service industry is

higher than the manufacturing industry (63,05; 54,09, p=.000). As a result, it can be said that the service companies operate with lower amount of capital but higher leverage ratios than the manufacturing companies. Sample companies were segmented into two on the basis of the number of employees, to measure the effect of the firm size on liquidity, profitability and debt structure. The companies with 250 or less number of employees are classified as small and medium-sized companies and the companies, which have more than 250 employees are classified as large-sized companies. The cash conversion cycle of the large companies is longer than the small and medium companies' (82,28; 63,57, p=.007). Additionally other liquidity, profitability and debt ratios did not vary in the investigated period on the basis of firm size (Table 4).

3.2.2. The Relationship among Cash Conversion Cycle, Liquidity, Profitability and Debt Structure

Besides the comparative analysis conducted according to the characteristics of the companies, correlation analysis was applied to detect the relationship of the cash conversion cycle with liquidity, profitability and debt structure. The results of Pearson Correlation Analysis are presented in Table 5. The results of the analysis show that the cash conversion cycle is positively related to the current ratio (.166; .000) and negatively related to return on assets and return on equity. If the cash conversion cycle increases, the return on assets and return on equity decrease. There is no relationship between the cash conversion cycle and net profit margin. There is positive relationship between other liquidity measures (current ratio and quick ratio) and net profit margin, return on assets and return on equity. There is no significant relationship between the cash conversion cycle and leverage ratio, but the leverage ratio is negatively related to current ratio, quick ratio and all profitability measures. An increase in leverage ratio negatively affects the liquidity and profitability.

3.2.3. The Effect of the Cash Conversion Cycle, Liquidity and Debt Structure on the Profitability of the Company

In this study, the effect of the cash conversion cycle, current ratio, quick ratio and leverage ratio on the profitability of the firm was tried to be defined by using regression analysis. The findings indicate that the cash conversion cycle has no effect on net profit margin. The variables that have most explanatory power are the leverage ratio (-0,273; .000) and current ratio (0,174; p=.000), the change in net profit (with R^2= % 15,9). The sign of the slope coefficient (β) in the leverage ratio shows the negative effect of debt ratio on net profit. This indicates that an increase in financial expenditure due to leverage ratio

shows the negative effect of debt ratio on net profit. This indicates that an increase in financial expenditure due to leverage ratio will result in a decrease in net profit. The return on assets is used as a dependent variable and the effect of cash conversion cycle, liquidity and debt ratio is investigated. It is found that the leverage ratio and current ratio explain the R^2=25 % of the change in return on assets. The cash conversion cycle (-0,086; 0.002) and leverage ratio (-0,354; 0.000) affect the return on assets negatively and the current ratio (0.206; .000) affects the return on assets positively. It should be noted that longer cash conversion cycle and higher debt ratio causes a decrease in return on assets. For testing the effect of the same independent variables on return on equity, a regression analysis was used. Although the leverage ratio (-0,185; 0,000) and cash conversion cycle (-0.099; 0,002) have negative effect on return on equity, quick ratio (0,072; 0,045) has a positive effect.

IV. Conclusion

The data on the cash conversion cycle, liquidity, debt structure and profitability, for the period 1995-2000, of 167 companies whose stocks are traded in the ISE were used in the study to measure the working capital efficiency. The cash conversion cycle, liquidity, debt structure and profitability of these companies were investigated and compared on the basis of two sub-periods, industry and firm size. The relationship of cash conversion cycle with liquidity, profitability and debt structure was examined by correlation analysis. Additionally, the impact of cash conversion cycle, liquidity and debt structure on the profitability of the companies was analyzed by regression analysis.

The findings of our study reveal that the cash conversion cycle did not vary in the economic recession period, but liquidity and profitability ratios decreased and debt ratio increased. In the recession period, companies operated with less working capital but their financial risks increased due to high debt ratio.

Manufacturing companies' cash conversion cycle is longer than service-other companies. This industrial difference in cash conversion cycle is consistent with the result of Belt (1985) and Meyer (1987). Manufacturing companies had higher amount of liquidity due to higher current ratios and their debt ratios were lower than the service-other companies' ratios. No statistically significant difference in profitability ratios between industries was found for the research period.

While large companies had shorter cash conversion cycle in the study conducted by Moss and Stine (1993) on the U.S. companies, our empirical results indicate that large companies had longer cash conversion cycle and there was no significant difference between liquidity, leverage and profitability

ratios.

The relationship of the cash conversion cycle with liquidity, profitability and leverage ratios was examined by Pearson correlation analysis. A positive relationship was found between the cash conversion cycle and current ratio; it is consistent with Lyroudi and Lazaridu's study's findings (2000). There was a negative relationship between cash conversion cycle and return on assets and return on equity. Longer cash conversion cycle may cause a decrease in return on assets and return on equity. Though there was no relationship between net profit margin and cash conversion cycle, there is a positive relationship between the current and quick ratios are positively related to net profit margin, return on assets and return on equity. Also, there is no significant relationship between the cash conversion cycle and the leverage ratios, but the leverage ratio affects the liquidity ratios and the profitability ratios in a negative way.

Finally, the effect of the cash conversion cycle, liquidity ratios and debt structure on the profitability was examined. It was found that net profit margin had a positive association with current ratio and negative association with the leverage ratio and the cash conversion cycle had no effect on the net profit margin. The leverage ratio was negatively related to return on assets and return on equity, but the cash conversion cycle was negatively related to return on assets and return on equity. Longer cash conversion cycle had a negative effect on the profitability.

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ANNEX

Table 1: Sample/Selected Firms' Characteristics (1995-2000)

Variables	Mean	Median	Standard Deviation	N
Cash Conversion Cycle	78,83	74,76	87,04	976
Current Ratio	1,71	1,50	0,98	982
Quick Ratio	1,08	0,92	0,78	982
Net Profit Margin	4,71	5,89	21,61	982
Operating Profit Margin	12,78	13,53	14,18	982
Return On Assets	7,56	7,18	14,16	992
Return On Equity	14,11	17,84	57,73	982
Financial Leverage Ratio	55,45	55,52	20,43	993

Tablo 2: Comparison Between the Periods

	Mean	N	Standard Deviation	T-Test	P Value
CCC					
1995-1997	80,05	484	84,52	0,526	0,599
1998-2000	77,96		89,31		
Current Ratio					
1995-1997	1,81	493	1,01	3,72	0,000**
1998-2000	1,61		0,94		
Quick Ratio					
1995-1997	1,13	490	0,80	2,507	0,012*
1998-2000	1,03		0,77		
Net Profit Margin					
1995-1997	10,16	490	10,44	8,800	0,000**
1998-2000	-0,73		27,72		
Operating Profit Margin					
1995-1997	16,64	490	14,06	10,79	0,000**
1998-2000	8,93		13,26		
Return On Assets					
1995-1997	12,45	490	10,40	13,919	0,000**
1998-2000	2,67		15,68		
Return On Equity					
1995-1997	24,57	490	34,18	6,023	0,000**
1998-2000	3,62		72,78		
Financial Leverage Ratio					
1995-1997	52,75	490	19,63	-7,019	0,000**
1998-2000	58,05		20,85		

*Significant at 0.05.
**Significant at 0.01.

Tablo 3: Comparison in Terms of Industry

	Mean	N	Standard Deviation	T-Test	P Value
CCC					
Manufacturing	92,06	828	81,57	12,958	0,000**
Service & Others	-2,45	142	72,33		
Current Ratio					
Manufacturing	1,75	842	0,95	3,899	0,000**
Service & Others	1,41	144	1,05		
Quick Ratio					
Manufacturing	1,07	833	0,73	-0,180	0,857
Service & Others	1,09	143	1,02		
Net Profit Margin					
Manufacturing	4,76	833	22,62	0,245	0,806
Service & Others	4,28	143	15,06		
Operating Profit Margin					
Manufacturing	13,52	833	14,10	4,441	0,000**
Service & Others	7,98	143	13,82		
Return On Assets					
Manufacturing	7,72	833	14,16	0,932	0,352
Service & Others	6,53	143	14,39		
Return On Equity					
Manufacturing	13,86	833	54,05	-0,172	0,864
Service & Others	15,00	143	76,75		
Financial Leverage Ratio					
Manufacturing	54,09	833	19,73	-4,413	0,000**
Service & Others	63,05	143	22,95		

**Significant at 0.01.

Tablo 4: Comparison in Terms of Firm-size

	Mean	N	Standard Deviation	T-Test	P Value
CCC					
Small & Medium-Sized	63,57	213	91,27	-2,704	0,007*
Large-Sized	82,28	733	79,98		
Current Ratio					
Small & Medium-Sized	1,64	219	0,95	-0,535	0,593
Large-Sized	1,68	743	0,82		
Quick Ratio					
Small & Medium-Sized	1,01	214	1,05	-0,837	0,403
Large-Sized	0,78	738	0,65		
Net Profit Margin					
Small & Medium-Sized	4,40	214	20,66	-0,203	0,839
Large-Sized	4,73	738	21,94		
Operating Profit Margin					
Small & Medium-Sized	12,03	214	15,78	-1,298	0,195
Large-Sized	13,54	738	11,59		
Return On Assets					
Small & Medium-Sized	6,29	214	15,38	-1,431	0,153
Large-Sized	7,96	738	13,85		
Return On Equity					
Small & Medium-Sized	9,59	214	82,53	-0,859	0,391
Large-Sized	14,67	738	48,33		
Financial Leverage Ratio					
Small & Medium-Sized	55,86	219	22,28	0,305	0,761
Large-Sized	55,35	744	19,51		

Table 5: Correlation Analysis

	Cash Conversion Cycle	Current Ratio	Quick Ratio	Net Profit Margin	Operating Profit Margin	Return On Assets	Return On Equity	Financial Leverage Ratio
Cash Conversion Cycle	1,000	0,166** 0,000	0,040 0,210	0,031 0,329	0,017 0,585	-0,059 0,064	-0,100** 0,002	0,024 0,463
Current Ratio	0,166** 0,000	1,000	0,913** 0,000	0,331** 0,000	0,032 0,317	0,396** 0,000	0,153** 0,000	0,570** 0,000
Quick Ratio	0,040 0,210	0,913** 0,000	1,000	0,310** 0,000	-0,057 0,074	0,375** 0,000	0,162** 0,000	0,500 0,000
Net Profit Margin	0,031 0,329	0,331** 0,000	0,310** 0,000	1,000	0,523** 0,000	0,817 0,000	0,132** 0,000	-0,370** 0,000
Operating Profit Margin	0,017 0,585	-0,032 0,317	-0,057 0,074	0,523** 0.000	1,000	0,577** 0,000	0,322** 0,000	-0,176** 0,000
Return On Assets	-0,059 0,064	0,396** 0,000	0,375** 0,000	0,817** 0,000	0,577** 0,000	1,000	0,326** 0,000	-0,470** 0,000
Return On Equity	-0,100** 0,002	0,153** 0,000	0,162** 0,000	0,132 0,000	0,322** 0,000	0,326** 0,000	1,000	-0,222** 0,000
Financial Leverage Ratio	0,024 0,463	0,570** 0,000	0,500** 0,000	-0,370** 0,000	-0,176** 0,000	-0,470** 0,000	-0,222** 0,000	1,000

**Significant at 0.01.

Regression Results

$NPM = \alpha + \beta_1 LR + \beta_2 CR$

Dependent Variable: Net Profit Margin

	β	T	P
LR	-0,273	-7,606	0,000
CR	0,174	4,841	0,000
Constant: 14,282			
F: 91,843			
P: 0,000			
Adj. R^2: 0,159			

$ROA = \alpha + \beta_1 LR + \beta_2 CCC + \beta_3 CR$

Dependent Variable: Return On Assets

	β	T	P
LR	-0,354	-10,355	0,000
CCC	-0,086	-3,033	0,002
CR	0,206	5,948	0,000
Constant: 17,278			
F: 110,289			
P: 0,000			
Adj. R^2: 0,252			

$ROE = \alpha + \beta_1 LR + \beta_2 QR$

Dependent Variable: Return On Equity

	β	T	P
LR	-0,185	-5,145	0,000
CCC	-0,099	-3,183	0,002
QR	0,072	2,007	0,045
Constant: 42,772			
F: 21,728			
P: 0,000			
Adj. R^2: 0,060			

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MEASUREMENT OF FOREIGN EXCHANGE EXPOSURE ON THE TURKISH PRIVATE BANKS' STOCK PRICES

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Abstract

All performance criteria of the banks are affected by the exchange rate fluctuations through foreign currency transactions and operations. However, exchange rate fluctuations -even without such activities can influence the banks through their affect on foreign competition, foreign loan demand and other banking conditions. Exchange rate exposure is classified as operation, transaction, and accounting exposures. Most of the studies, which measure these exposures, focused on the affect of the exchange rate exposure on the value and stock price of the firm. High inflation rates, a highly volatile foreign exchange market, increasing tendency of the banking system to work with exchange rate exposure and the absence of sufficient instruments to cover the exchange rate risk can explain the importance of the foreign exchange exposure in Turkey. Turkish banking system that is the biggest actor in the financial system operates with exchange rate exposure and therefore it is important to analyze the effect of the exchange rate risk on the Turkish banking system. For this purpose, a cointegration model has been estimated to analyze the effect of unanticipated changes in the exchange rate on the stock prices of the 11 commercial banks, which were quoted in the Istanbul Stock Exchange Market.

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I. Introduction

After the collapse of the Bretton Woods, most countries adopted the flexible exchange rate systems and abandoned the adjustable peg, which caused many firms (mostly multinational) to face the problem of foreign exchange exposure. Foreign exchange risk, in general, effects the cash flows and therefore the value of the firms. In other words, foreign exchange risk that occurs as a result of unanticipated changes in the exchange rate affects all firms and the sectors in the economy. However, mostly multinational companies, and banks that deal with foreign currency transactions and foreign operations are affected by the uncertainty in the exchange rates. Exchange rate exposure is classified as operation, transaction, and accounting affects. Most of the studies, which measure these affects, focused on the impact of the exchange rate exposure on the firm value and the stock price of the company.

All performance criteria of the banks are affected by the exchange rate fluctuations through foreign currency transactions and operations. However, exchange rate fluctuations -even without such activities can influence the banks through their affect on foreign competition, foreign loan demand and other banking conditions.

High inflation rates, highly volatile foreign exchange market, increased tendency of the banking system to work with exchange rate exposure and absence of sufficient instruments to cover the exchange rate risk can explain the importance of the foreign exchange exposure phenomenon in Turkey. Turkish banking system that is the biggest actor in the financial system operates with exchange rate exposure and therefore it is important to analyze the effect of the exchange rate risk on the Turkish banking system. For this purpose, a cointegration model has been estimated to analyze the effect of foreign exchange risk on the stock prices of the 11 private deposit banks, which were quoted on the Istanbul Stock Exchange Stock Market (ISE).

The first step in the empirical section of the study is to analyze if the variables contain a unit root. The next is to estimate a cointegration model to examine the effect of unanticipated changes on the stock prices of these banks in the long-run.

The next section is devoted to explain the concept of foreign exchange exposure. Section three reviews the empirical literature. Section four analyses the effect of unanticipated changes in the exchange rate on these banks and the final section presents the conclusion.

II. Foreign Exchange Exposure

Foreign exchange exposure occurs as a consequence of the unanticipated

changes in the exchange rate. Anticipated changes in the exchange rate do not contain any risk for individuals, companies, or governments.

In general, foreign exchange exposure is described as the statistical variance of the domestic-currency value of an asset, liability or operating income, which is attributable to unanticipated changes in exchange rates (Levi, 1996; Adler and Dumas, 1984). Foreign exchange exposure affects all sectors and firms in the economy. In addition to this it is more effective on the firms, which operate internationally and/or which demand foreign loans. Foreign exchange exposure can result from different sources. i) The most common type of foreign exchange exposure results from trade flows. This happens when the firms realize at least some of their sales and/or costs such as raw materials in terms of a foreign currency. ii) Another source of the exposure is owning a foreign subsidiary. This type of exposure occurs in two different ways. The first one is called as the profit translation, which is the value in the currency of the parent company of a constant stream of profits from the foreign subsidiary that will change along with a change in the foreign exchange rate. The second way of exposure is called the balance sheet exposure. This occurs when the balance sheet value of the foreign subsidiary in the parent company's currency will change due to changes in exchange rates. iii) Exposure may appear as a result of borrowings in foreign currency. Because, firms may not always find foreign funds in their national currencies. iv) Finally, the least type of the exposure is the strategic exposure. This occurs as a result of the large currency movements. The Asian crisis is an example for this type of exposure. Large currency devaluations were experienced in the Asian crises, which harmed many firms. The firms in these countries reduced their scales, or were closed or the owner of the firms changed after the crises (Asiamoney, 1997/1998).

Foreign exchange risk and foreign exchange exposure are related concepts but they should be evaluated differently. Mostly, these two concepts are used interchangeably. However, foreign exchange exposure is defined as the sensitivity of changes in the real domestic-currency value of assets, liabilities or operating incomes to unanticipated changes in the exchange rate (Altay, 1999; Levi, 1996).

Foreign exchange exposure for the firms can be measured in three different ways. These are transaction exposure, operating exposure (these two types of exposure comprise the economic exposure), and translation/accounting exposure (Eiteman et al, 1998). Operating exposure measures the change in value of the firm, which occurs as a result of changes in the future operating cash flows caused by an unexpected change in exchange rates. Transaction exposure measures changes in the value of outstanding financial obligations contracted

before a change in exchange rates but not due to be settled until after the exchange rate change. Transaction exposure concerns changes in the cash flows that result from existing business liabilities. Translation/accounting exposure occurs as a result of the need to translate foreign currency financial statements into a single reporting currency.

The foreign exchange exposure, which is caused by the unexpected changes in foreign exchange rates force the companies to manage the foreign exchange exposure. But for an effective strategy, the management should determine what is under risk. This task can be accomplished by a group of staff that tries to maintain the cash flow according to economic and financial realities, while the other group of staff should try to protect their companies from the translation/accounting exposure.

Since accounting techniques –no matter how perfect these techniques are- depend on historical records, they cannot measure properly the effect of the unanticipated changes in the exchange rate on the future cash flows of the firms. Therefore, the companies should be protected from the effect of unanticipated changes of the exchange rates on their market values and also the cash flows should be protected from the economic exposure, which occurs as a result of operating and transaction exposures. This is accepted as the most appropriate strategy, which aims at maximizing the net present value of the future cash flows.

Balanced foreign exchange positions of the banks show that they are not under risk. On other hand, they can face foreign exchange exposure, which depends on their short or long position caused by foreign exchange operations. The risks of the banks that they can face according to foreign exchange operations can be grouped in three different ways. The first of these is the credit risk. The credit risk can occur when the credits are in foreign currency. These types of operations cause foreign exposure for the banks in the repayment of their debts. Second type is the exchange rate risk. In order to meet the demands of their customers, banks can buy or sell foreign currency. If the banks cannot balance their foreign currency accounts, they can be affected from the fluctuations in the exchange rates. The last type of the risk is liquidity risk. Banks can use their accounts at the Central Bank or at domestic or foreign correspondents in order to realize their credit, deposit, debt and interest payments in foreign currency, on time. The imbalances occurring due to these types of foreign currency transactions can cause foreign exchange exposure for the banks (Altay, 1999). Existence of the foreign exchange exposure may influence the stock prices as well as the values of the firms. Therefore, firm managers should take into consideration the effects of these types of risks on the stock

prices and values of their firms.

III. Review of the Empirical Literature

There are several studies in the literature, which identify the foreign exchange exposure and explain its affect from different perspectives. This section presents a summary of the selected studies.

Adler and Dumas (1984) explain the differences between foreign exchange rate risk and foreign exchange exposure. Here, foreign exchange risk is defined as the unexpected changes in the exchange rate and the foreign exchange exposure indicates the coefficient of the simple regression between exchange rate changes and prices or returns. They measured the foreign exchange exposure on the foreign currency basis. They emphasized that this is the amount, which should be protected from foreign exchange rate changes. They measured the foreign exchange exposure by dividing the covariance between exchange rates and stock prices by the variance of the exchange rate cov(P,S)/var(S).

Jorion (1990) measured the flexibility of the multinational US companies to the foreign exchange exposure. It was claimed that the value of a firm is related to the flexibility of the fluctuations in the foreign exchange rates and the foreign exchange exposure is measured as the regression coefficient, which determines the change in the value of the firm. The model was constructed as follows: $R_{it} = \beta_{0i} + \beta_{1i} R_{st} + \varepsilon_{it}$ where R_i shows the rate of return of the firm and R_s shows the trade weighted exchange rate. It is known that multinational companies protect themselves from operational and accounting effects by using various instruments. If the activities of protection from the risk are known and added to the stock prices, then this would weaken the correlation between the stock prices and the foreign exchange rate. Another important issue is that the ratio of foreign revenue to the total revenue, which is important for the foreign exchange exposure, was replaced with the ratio of foreign sales to the total sales. It was shown that foreign exchange exposure is also related to this ratio. Jorion also found that there were cross section foreign exchange exposure differences in the multinational US companies. However, it was found that foreign exchange exposure of the US multinationals was related to the share of their foreign sales in the total sales. It was also found that companies, which do not have foreign transactions, were also affected by the foreign exchange exposure.

Jorion (1991) analyzed the pricing of foreign exchange exposure in US stock market by using two factors and multi-factor pricing models in his study. The results showed that the relation between the value of the US dollar and returns of stocks is systematically changing on industrial basis. In addition to

this, the empirical results of this study showed that the foreign exchange exposure was not priced in the stock market. In other words, unconditional risk premium related to the foreign exchange exposure was found to be small and statistically insignificant. 20 different industrial portfolios from the New York Stock Exchange were constituted. Both the two factor and the six factor models were applied to these 20 industry portfolios. The important findings are: i) a positive foreign exchange exposure was found in the chemical and machinery industries (these are exporting industries) for both models. ii) a negative foreign exchange exposure was found in the textile and the hypermarket industries (these are importing industries) and iii) Foreign exchange exposure for the rest of the industries was found to be insignificant. There is no systematic relationship between foreign exchange exposure and stock returns in general. The results suggest that US investors do not price foreign exchange exposure.

Bartov and Bodnar (1994) investigated the relationship between foreign exchange rate changes and abnormal returns in the multinational companies. It is widely known that the changes in the foreign exchange rates affect the values of the firms. However, the past empirical studies could not find any relation that the foreign exchange rate changes result in a change in the current value of the firms. They claim that there are two possible causes for that. First of these is selecting a wrong sample, that is, the selected firms had either weak international relations or the foreign exchange exposure is in a different direction. The second cause is systematic mispricing which means that a change in the current value of the firm might result from the lagged changes in the foreign exchange rate. Although, this study could not find any relationship between abnormal returns of the firms and current exchange rate changes, it was found that abnormal return and lagged exchange rate changes were related. It is possible to conclude that investors cannot use all available information on time. Current data for investment decision is used with a delay, however past information determines the present investment decisions.

Chamberlain et al (1997) examined the foreign exchange exposure for a sample of US and Japanese banking institutions. Daily data was used to estimate the exchange rate sensitivity of the equity returns of the US banks and to compare them with those of the Japanese banks. It was found that the stock returns of a significant fraction of the US companies move in line with the exchange rate, while a few of the Japanese returns were observed to do so. This study i) was able to discern exchange rate exposure among individual US banks. This study also used daily observations instead of monthly observations, which increased the power of the tests. ii) A link between foreign exchange exposure and stock returns was found. The results also provided some insights

into the usefulness of accounting indicators. iii) estimated the exchange rate exposure for Japanese banks and compared it with US banks. It was also found that using daily data, the stock returns of approximately one third of the large US bank holding companies were sensitive to exchange rate changes. In contrast, a few Japanese bank returns were found to be sensitive to exchange rate changes.

Merikas (1999) investigated the structural relationship between the exchange rate exposure and the stock value of the Greek banking institutions. Although, exchange rate is a significant determinant of the bank returns, an augmented market model was used since exchange rate is not the only parameter to determine the returns. The estimated equation included the general index of the Athens Stock Exchange as one of the independent variables to represent the market return (R_m). In order to provide control over the sources of the sectoral variations in returns such as changes in the interest rates, sectoral bank index (R_b) was also incorporated into the analysis as a second independent variable. Third independent variable is nominal exchange rates (S_1=USD, S_2=DEM, S_3=JPY). The estimated model is as follows ($R_t = \alpha_0 + \alpha_1 R_m + \alpha_2 R_b + \alpha_3 S_1 + \alpha_4 S_2 + \alpha_5 S_3 + U_t$), and the variables used in the analysis were checked for stationarity. The long-run relationship was checked among the variables. The analysis was conducted on a daily basis and covers the period between August 1995- November 1998. The empirical results indicated that the stock returns of the Greek banks were directly influenced by the three major currencies.

Altay (1999) analyzed the effects of the real exchange rate exposure on the real returns of the stocks in the ISE. The relationship between real stock returns of 50 different companies and the changes in the real exchange rate were analyzed by using 10 different models. The period under analysis is 1991-1996. The results are as follows: i) the explanatory power of the exchange rate changes on the stock returns was between 0.58 % and 14.58 %. This result indicated that the exchange rate changes could not explain the stock returns. ii) changes in the exchange rate effects only 4 firms out of 50, which indicated that stock returns or pricing of the stock returns were not affected by the exchange rate exposure. iii) the foreign exchange exposure was found to be unrelated to the degree of openness. iv) protection from the foreign exchange exposure in the ISE depends on other factors and therefore this effect was taken into consideration in pricing. It was also concluded that absence of a forward market limited the analysis to measure the effect of the foreign exchange exposure on the stock returns.

Gao (2000) studied the manufacturing multinational companies. Unlike the

other studies, this study considered the time variability of exchange rate exposure by including foreign sales and foreign production information in the analysis. The ratios used in the analysis were i) export/total output, ii) import/import + total output, iii) foreign sales/total sales, iv) foreign assets/total assets and, v) number of companies in the sample. The effect of the exchange rate movements on the profitability of the firms had important implications for macroeconomic theory and policy, and also for the decisions of the firms on production, sales, pricing policy, and financial operation. Empirical results indicate that effect of the exchange rate changes on the profitability is less than its effect on the production. This study proposed a model relating exchange rate exposure to foreign sales and production of a multinational firm. Theory predicts that unexpected changes in the exchange rate increase the foreign sales of the firm, but decrease the foreign assets. The overall impact of the exchange rate is the sum of these two opposite effects. The model was applied for a sample of 80 multinational firms. The results suggested that profitability of the firms were effected by the unexpected changes in the exchange rates as predicted by theory and the results were found to be statistically significant.

Martin (2000) studied the exchange rate exposure for each important financial institution by assessing country-specific portfolios and global portfolios. It was found that more than 40 percent of the important financial institutions were exposed to changes in the value of their domestic currencies. Almost 60 percent of the key institutions and 75 percent of the key non-US institutions were affected by the changes in the value of the US dollar. The results also revealed that US portfolios are less exposed than the other countries' portfolios and it was claimed that this might be attributed to more restrictive regulatory and supervisory requirement implied on US institutions.

Allayannis and Ihrig (2000) examined proper specification and testing for the factors that affect the exchange rate exposure of the stock returns. They developed a theoretical model, which defined three channels of exposure. It was claimed that exposure in an industry increases where the final output is sold i) by greater competitiveness in the market, ii) the interaction of greater competitiveness in its exports and a higher share of exports in production, iii) the interaction of lower competitiveness in the imported input market and the smaller the share of imports in production. The sample covered 82 US manufacturing industries classified at the 4-digit SIC level and 18 industry groups in 2-digit SIC level between 1979 and 1995. It was found that exchange rate movements for a firm are an important source of risk. Stock returns instantaneously adjust to an unanticipated change in the exchange rate in efficient markets. However, it takes a considerable time for investments to

adjust. It was found that 4 industry groups out of 18 were significantly exposed to exchange rate changes through one of the channels of exposure. The results indicated that a one-percent appreciation of the dollar decreases the return of the average industry by 0.13 percent.

IV. Testing the Foreign Exchange Exposure on the Turkish Commercial Banks' Stock Prices

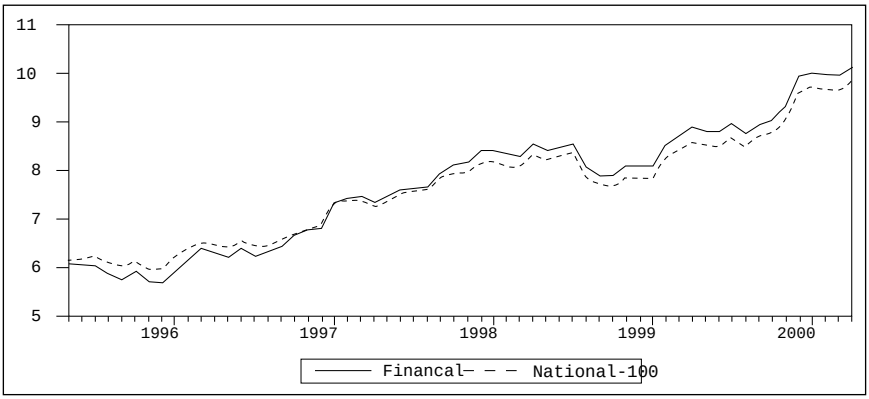
Although the Turkish banking system works under tight regulations, the banking institutions operate with foreign exchange exposure, which constitutes about 30 percent of their equities. Therefore, as the international financial institutions have also mentioned, the Turkish banks are exposed to the foreign exchange risk (IMF, International Capital Markets, 1999).

This section of the study will analyze the foreign exchange exposure of the Turkish commercial banks, which have a significant weight in Turkish financial system.

4.1. Scope of the Study and Data

The purpose of this study is to analyze the effect of the unanticipated changes in the exchange rate on the stock prices of the Turkish Banks. Therefore, 11 commercial banks have been included in the analysis that has been quoted in the (ISE) for the period under analysis. The analysis has been conducted on a monthly basis, which covers the period between May 1994- May 2000. The reason for choosing this period is to exclude the effects of 1994 and 2001 crises from the estimation period. Initially, both the US Dollar and the German Mark were included into the analysis. However, high degree of correlation between the German Mark and the US dollar (over 80 percent correlation) indicated to include only one of these variables. Therefore, the US Dollar was used to represent the impact of exchange rate changes. A similar correlation was found between the ISE Financials Index and the ISE National-100 Index. Therefore, it was decided to use the National-100 Index instead of using both indices. The high degree of correlation between the National-100 Index and the Financials Index can easily be seen below in Graphic 1. The data used in the estimation are stock market prices of the banks under investigation, the ISE National-100 Index, and Lira-Dollar nominal exchange rate. The data were obtained from the web pages of the Istanbul Stock Exchange Market and Analiz Yat›r›m Araflt›rmalar› A.fi.

Graphic 1: ISE National-100 and ISE Financial Index



4.2. Model

The model used by Merikas (1999) has been used in the empirical analysis in order to determine the effect of the unanticipated changes in the exchange rate on the stock prices of the 11 banks under analysis. The stock price of each bank (R) is determined by the unanticipated changes in the exchange rate (S) and the ISE National-100 Index (U), which is accepted to represent the general market index.

$$R_t = \beta_0 + \beta_1(S_t) + \beta_2(U_t) + e_t$$

Moving sample standard deviation of the nominal exchange rate has been used as the proxy variable to represent the volatility term. (ner) denotes the nominal exchange rate and m is determined by using Akaike information criterion (Karasoy, 1995) and the value of m was determined to be 12 in our analysis.

$$S_t = [(1/m) \sum_{i=1}^{m} (\text{In ner}_t - \text{In ner}_{t-1})^2]^{1/2}$$

Johansen cointegrating technique is used to analyze the long-run relationship among the stock prices, general index, and exchange rate risk. Time series methods have been widely discussed in the literature, therefore, the results will be presented without explaining the details of this method.

Stationarity of the variables used in the analysis was determined by using Augmented Dickey-Fuller (ADF) tests and it was found that all series have unit root processes. This indicates that the series are stationary in their first

differences and therefore it was concluded that cointegrating techniques have to be used. The results of the ADF tests have been presented in Table 1. Perron (1989) was used to determine the appropriate order of lag in ADF. The maximum lag length was determined to be 24. The process of lag elimination continued until the t-test of the last lagged term is significant at the 10% critical level. The number in parentheses in Table 1 denotes the number of lagged differenced terms in ADF.

Table 1: Unit Root Tests

Akbank	-2.70 (14)
Alternatif Bank	-3.16 (18)
Demirbank	-2.80 (23)
D›flbank	-2.37 (11)
Esbank	-3.12 (10)
Finansbank	-3.10 (11)
Garanti Bankas›	-3.15 (12)
‹fl Bankas›	-2.77 (12)
Tekstilbank	-2.34 (7)
Yaflarbank	-2.75 (10)
Yap› Kredi Bankas›	-2.69 (12)
ISE National 100	-2.83 (17)
TL/USD nominal exchange rate	-2.35 (19)

Not: MacKinnon critical values are used.

Johansen cointegration technique requires determination of the appropriate order of lag in VAR. Schwarz' Bayesian Information Criterion (SBCI) was used to specify the lag structure in the VAR and in all 11 cases a lag of 2 was found to be sufficient. It was also analyzed that the residuals in the VAR are white-noise and normally distributed. The results have been presented in Table 2. The residuals were tested for serial correlation and normality by using Lagrange multiplier and Jarque-Bera test, respectively. The results in Table 2 show that the residuals are white-noise and normally distributed. However,

the normality assumption for the residuals was not satisfied in case of Yaflarbank[1] Addition of higher lags in the VAR did not change the results. The results for other cases are satisfactory and the lag specifications are adequate.

Table 2: Diagnostic Statistics for the Residuals

	J - B	AR (1)	AR (2)
Akbank	1.13	1.08	2.01
Demirbank	3.31	0.47	0.53
D›flbank	3.71	0.87	0.98
Finansbank	4.78	0.02	0.45
Garanti Bankas›	1.97	0.01	1.66
‹fl Bankas›	5.48	0.21	3.13
Yaflarbank	10.6	0.38	0.51
Yap› Kredi Bankas›	2.17	0.44	0.65
Alternatif Bank	2.05	1.50	2.54
Esbank	0.13	0.01	0.06
Tekstilbank	1.04	0.01	0.02

Results of the Johansen cointegrating technique have been presented in Table 3. Both maximum eigenvalue and trace test results failed to find a long-run equilibrium relationship between stock prices of 9 banks and exchange rate risk. However, a long-run equilibrium relationship between stock prices of Esbank and Yaflarbank and the exchange rate risk term was found. The analysis was conducted under the assumption that the data have linear deterministic trends.

[1] Results of the Jarque and Bera test should be interpreted carefully. Because, the test is nonconstructive. If the test result does not show that the series are not normally distributed, it does not indicate the next step . Another point which should be noted is that, even if the test result suggests nonnormality, it does not confirm it (Green, 1993, p.310).

Table 3: Johansen Cointegration Analysis

	Trace Test	Max. Eigenvalue
Akbank	37.41	24.67
Demirbank	35.56	21.83
D›flbank	35.07	22.21
Finansbank	32.94	17.75
Garanti Bankas›	32.41	19.15
‹fl Bankas›	32.12	17.22
Yaflarbank	47.94*	26.79*
Yap› Kredi Bankas›	34.41	24.37
Alternatif Bank	26.10	15.15
Esbank	46.01	24.45
Tekstilbank	34.18	18.06

Notes: Critical values for trace test and maximal eigenvalue tests at %5 level of significance are 42.44 and 25.54, respectively.
*indicates significant at 5% level.

The long-run coefficients normalized with respect to the Yaflarbank stock prices are presented below.

$$R_{yaflarbank} = -9.52 - 0.92\,(S) + 0.24\,(U)$$

The long-run coefficients normalized with respect to the Esbank's stock prices are presented below.

$$R_{esbank} = -3.44 - 0.98\,(S) - 0.75\,(U)$$

The long-run coefficients of the risk term are 0.92 and 0.98, which indicate that there is almost a one to one effect of the unanticipated changes in exchange rate on the stock prices of the two banks in the long-run. The error correction models can be estimated as follows. The coefficient of the error correction term (ec_{t-1}) is (-0.54) which shows a slow speed of adjustment. The sign of this term is correct and it is significant. The values in parentheses are t-statistics.

$$\Delta R_{yaflarbank} = -0.54\ (ec_{t-1}) + 0.12(\Delta R_{t-1}) + 0.43(\Delta R_{t-2}) + 0.67(\Delta U_{t-1}) - 0.35(\Delta U_{t-2})$$
$$(-4.12) \qquad (0.65) \qquad (2.56) \qquad (2.92) \qquad (-1.46)$$

$$- 4.53(\Delta S_{t-1}) - 1.48(\Delta S_{t-2})$$
$$(-0.59) \qquad (-0.20)$$

Application of the error correction model for Esbank shows a coefficient of (-0.72) for the error correction term and this term has also the right sign and is statistically significant. The speed of adjustment is also slow in the case of Esbank although it is faster than Yaflarbank.

$$\Delta R_{esbank} = -0.72\ (ec_{t-1}) + 0.20(\Delta R_{t-1}) + 0.34(\Delta R_{t-2}) + 0.04(\Delta U_{t-1}) - 0.40(\Delta U_{t-2})$$
$$(-3.33) \qquad (0.90) \qquad (1.75) \qquad (0.19) \qquad (-1.91)$$

$$- 1.06(\Delta S_{t-1}) - 5.26(\Delta S_{t-2})$$
$$(-0.16) \qquad (-0.82)$$

A long-run equilibrium relationship was not found between exchange rate risk term and the stock prices for the other 9 banks namely, Akbank, Demirbank, D›flbank, Finansbank, Garanti Bankas›, ‹fl Bankas›, Yap› Kredi Bankas›, Alternatifbank and Tekstilbank. These findings indicate that these banks' stock prices have not been affected by the unanticipated changes in the exchange rate in the long-run. In other words, these banks' stock prices may not be subject to foreign exchange exposure in the long-run.

III. Conclusion

Turkish economy has experienced a prolonged economic crisis. Financial markets and especially the banking sector, which is the main actor of the financial markets, were severely hit by the crises. As it is widely accepted, any crises in the financial sectors intensify the crises in the real sectors of the economy. This study aimed at analyzing the foreign exchange exposure of the Turkish banking sector.

A long-run relationship between unanticipated exchange rates and stock prices of the banking institutions was examined. Empirical results showed that a long-run relationship between unanticipated exchange rates and stock prices was found only for Yaflarbank and Esbank out of 11 cases. It was found that Akbank, Demirbank, D›flbank, Finansbank, Garanti Bankas›, ‹fl Bankas›, Yap› Kredi Bankas›, Alternatifbank, and Tekstilbank were not affected by the unanticipated changes in the exchange rate in the long-run.

The analysis covered the period between two recent currency crises in

Turkey. Therefore, the findings of this study are supported by the current status of the banking sector. In other words, Yaflarbank and Esbank were transferred to Saving Deposit Insurance Fund (SDIF) and we found in our analysis that these two banks are affected by the unanticipated changes in the exchange rates in the long-run. Currently, the other 9 banks namely Akbank, D›flbank, Finansbank, Garanti Bankas›, ‹fl Bankas›, Yap› Kredi Bankas›, Alternatifbank, and Tekstilbank (except Demirbank)[2], still operate in the sector under unfavorable economic and financial conditions and this also supports our findings.

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INCOME VELOCITY OF MONEY (M2): THE CASE OF TURKEY, 1986-2000

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Abstract
The aim of this study is to test the long-run relation among income velocity of money (M2) as dependent variable and real income, interest rate and real exchange rate as independent variables, for Turkey between 1986.1-2000.4. Johansen Co-Integration and Error-Correction Methods are employed and a long-run relation among these variables is determined through the Johansen Co-integration method where the parameters obtained are consistent with theoretical expectations. Error Correction Method, however, reveals a fairly low adjustment speed (0.05) of short-run shock to long-run equilibrium.

I. Introduction

Income velocity of money (hereafter velocity) is defined as the ratio of total income to money supply; as Carlson and Byrne (1992) states, that is subject to complex structural relations and that determination of velocity is being debated in the monetary theory for a long time. Siklos (1993) stresses that explanation of the fluctuation in velocity is particularly important while monetary policy is being designed. Afl›r›m (1996) emphases the relationship between velocity and the success of monetary policy as follows: “It is claimed that stability and predictability of velocity with respect to monetary indicators are necessary for a successful monetary policy. In addition to the monetary

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targets, stable and predictable growth rates are necessary for a successful monetary policy. In another words, it is highly possible that monetary policy becomes unsuccessful if the velocity is unstable. Therefore, the change in velocity over the time and, causes of these changes become particularly important for an economy."

Needless to say, velocity and its determinants play a central role in monetary policy. Literature on velocity begins with Friedman (1956), Brunner and Meltzer (1963) and Tobin (1961). Humprey (1993) claims that Fisher's pioneering study of 1911 includes more information than Friedman's velocity function. Studies on velocity go back 250 years. The very first study on velocity function was performed by William Petty (1623-1687) and based on gold coin. The theory of velocity was developed by John Locke (1632-1704) and Richard Cantillon (1680-1734). It was only in the nineteenth century that inflationary expectations were added to the velocity functions. Henry Thorton (1760-1815), J. B. Say (1776-1832) and Nassau Senior (1790-1864) are the first generation of economists to make contributions on the effect of inflationary expectations to velocity function. The last contributions before Fisher were made by Henry Thornton and Knut Wicksell.[1]

Traditionally, velocity is solved as analogous to real monetary balances. It means velocity is taken as a function of income and opportunity (alternative) costs. Additional variables are added to this function, representing opportunity cost of holding money. As a result, Bordo, Joung and Siklos, (1997) claims that, variables added to function, other than income and interest, are representing opportunity costs of holding money. In the Traditional Approach, Siklos, (1993) and Raj (1995) stressed that income velocity is acknowledged as a "stable" function of the opportunity cost of holding money (and/or other assets), and

income (or permanent income) in the Traditional Approach.

If one acknowledges the Intitutionalist Approach[2] in determination of empirical velocity function, institutional changes that have occurred in the financial markets must be included. Siklos (1993) relates this concept to the "monetization" process that has been observed in many economies, and, secondly; the conversion of financial system into a more sophisticated and innovative structure. In contrast to the Institutional Approach, there exist studies, e.g. Carlson, Craig and Schwarz (2000) demonstrates that financial innovations do not affect M2 velocity. The instability that had been observed

[1] See for detailed literature survey Humphrey (1993) and Ergin (1983).

[2] See Bordo and Jonung (1981, 1990), Siklos (1993), Ireland (1991), Hallman, and Small (1991), Raj (1995) and Bordo, M. D., L. Jonung, P. L. Siklos (1997).

in velocity during the nineteen seventies led to the debates that question the Traditional Approach. Researches are concentrated in three areas; Barnett and Xu, (1988) defines the theme respectively: "first area is on the "true" definitions of money supply parameters. The second is the effect of institutional changes on the velocity. The third one is Friedman's hypothesis of 1983".

Regarding the first area; a number of empirical studies have been performed on a proposition that suggest relationship between monetary uncertainty and velocity of money. The relationship between real sector and monetary sector are depending particularly on the predictability and stability of velocity. Economists are concentrated on instability and unpredictability of M1 velocity.[3] As for the second area; Gordon, Leeper and Zha (1998) points out that substitutions of different monetary assets effect the long term behavior of velocity which is supported by some institutional factors. Friedman (1983) has stressed a relationship between velocity and monetary uncertainty. According to Friedman's basic hypothesis, uncertainty on monetary growth will cause uncertainty on standard economic variables such as interest rate, income and prices. Economic agents will demand more money and velocity will decline.[4]

It is assumed that financial liberalization in the Turkish economy after the 1980s and corresponding currency substitution have made the predictability and stability of income velocity of M2 an important element of monetary policy. The goal of this study is to test M2 income velocity of money by Johansen (1988,1991) co-integration analysis for Turkey for the period between 1986:1 and 2000:4.

The paper has four sections. The first section initiates a linear income velocity function and; the relationship between the variables are being defined in the second section. The third section is devoted to testing for income velocity of M2 in Turkey to determine whether it is stable or not, by using unit root and Hodrik-Prescott (HP) filter. Long-term relationship is being tested by co-integration analysis and their conclusions are discussed. Section 4 is allocated to the general conclusion.

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[3] McDougall (1994) and Barnet and Xu (1988) have findings on unstability of velocity, Karemera and others (1998) stability of velocity. Aarle and Budina (1995) points out that currency substitution accelerates unstability of velocity.

[4] Employing cointegration and Granger causality test, Mccornac (1994), Ewing (1996), Payne and Ewing (1998) for developed countries; Owoye (1997) for underdeveloped countries have reached supporting conclusions for the Friedman Hypothesis. Basu and Dua (1996) and Thornton (1995) have concluded, slightly supporting the Hypothesis, while Mehra (1989) rejects it. Katsmbris and Miller (1993) have findings that the effect of nominal interest rate on velocity is greater than that of uncertainty of growth of money supply. Chowdhury (1994) had concluded that inflationary expectations have caused an increase on income velocity of money in 23 developing countries.

II. Model

Lee and Hwang (2001) approach has been adopted by which basic income velocity equality is written as real income (y); as an indicator of opportunity cost, nominal short-term interest rate (r), and real exchange rate (x)

$$\frac{y}{m} = f(y, r, x) = e^{\alpha}\ y^{\beta}\ r^{\gamma}\ x^{\delta} \qquad (1)$$

Taking the natural logarithm of equation (1) to obtain a testable model is given by the following equation

$$\ln\left(\frac{y_t}{m_t}\right) = v = \alpha + \beta \ln y_t + \gamma \ln r_t + \delta \ln x_t \qquad (2)$$

Here y represents real income, m real supply of money, r interest rate and x real exchange rate.

If income elasticity of demand for money β is less than 1, velocity of money will increase as income increase in equation (2). In another words, as income increases demand for money rises less than that increase; therefore income velocity will increase. If we assume the supply of money as a luxury good, the long-term income elasticity of demand for money will be greater than 1 and $\beta < 0$, the coefficient of $\ln y_t$.

It must be $\gamma > 0$, since the interest rate increases income elasticity of money. High interest rates increases the opportunity cost of holding money and therefore the tendency for holding money balances will decline. This implies a positive relationship between the interest rate and the velocity of money. Short and long-term interest rates in the process of determination of the demand for money have been controversial in the literature. Some authors claim that long-term interest rate is more appropriate than short-term interest rate in the determination of the demand for money while the others' claim is that money could be demanded for precautionary reasons against future uncertainties in income and spending. There are studies that employ both short-and-long term interest rates together, but large instabilities have been observed in parameters. Anderson and Rasche (2001) argue on this subject and conclude that either short or-long term interest rates should be taken. Siklos (1993) argues that the interest rate should be taken as an indicator of the own return of money, but, in general, short-term interest rate is taken to represent this variable.

Arize, Malindretos and Shwiff (1999) point out that there is no general agreement in literature on the effect of the exchange rate on the velocity of money. They explain that the depreciation of national money will cause an increase in the value of foreign assets held by residents. If this is considered

as an income (wealth) increase, the demand for money will increase. Hence, $\gamma < 0$, since the velocity will decline as the demand for domestic money increases. Lee and Hwang (2001) discuss that the coefficient of real exchange rate will be less than zero, the appreciation of the real exchange rate will make a positive contribution to foreign trade balance and real income; hence the demand for money will increase. In short, the velocity of money will decline since an increase in the demand for money will be greater than real income. On the other hand; as Arize, Malindretos and Shwiff (1999) discuss, the expected future return of weak domestic currency will be low; residents who hold assets will convert some of their portfolio from domestic currency to foreign currency and this will cause a decline in the demand for domestic currency as well as an increase in velocity of money. Therefore, it must be $\delta > 0$. According to Holmes (2000) and Aarle and Budina (1995), financial integration will increase the degree of currency substitution, instability in the demand for domestic currency and an increase in the velocity of money. Hence, an increase or expected increase in real exchange rate will effect currency substitution, and accordingly the velocity of money will increase; $\delta > 0$ in the equation.

III. Econometric Method and Empirical Findings

The theoretical discussions in the literature are based on instability of the velocity of money and its determinants. Should the time series notation is utilized, the test must be done on whether the time-serial data has unit root, in another words, whether permanent and/or temporary shocks on the time-serial data have an effect on the stability of velocity of money. Since the data is quarterly, it is necessary to conduct seasonal unit root test and HP method for the measurement of stability. Long-term relations in equation (2) will be tested by the Johansen cointegration method and short-term relation by error correction method.

3.1. Time Series Characteristics of M2 Income Velocity

Both narrow and broad money fluctuations have always confused the monetarist economists. The upward trend in the US economy has been reversed in the 1980s. Arize (1993) argues that the change in income velocity of money is associated with a change in the process of velocity. Restructing of financial markets and financial innovations are assumed to be responsible for change. Karemera and others (1998) test the velocity by the random walk hypothesis (RWH) for seven developed economies and that the hypothesis is not supported, i.e., the velocity is stable.

In this section, the characteristics of income velocity of broad money (M2) have been determined for Turkey for the period of (1986:1-2000:4). If a time-series data include unit root, shocks do have permanent effect. Balc›lar and Dülger (1997) point out that, whereas unit root tests determine the existence of permanent components, they do not reject the existence of temporary ones. Income velocity of M2 contains seasonal unit root as shown in Table 1. Therefore, time-series data are not stable and that the effect of shocks are permanent. On the other hand, the variable has been filtered by the Hodrik-Prescott filter (Prescott, 1986); permanent and temporary components have been obtained (Appendix Figures 1-2). It has been observed that the variance of temporary components between 1986-1994 is 0.063 and that is greater than the variance of 1994-2000, which is 0.033 for income velocity of M2 (v2). It means the variation in the first period is greater than that of the second and that the change in variation also becomes greater. Figure 2 in the Appendix shows permanent components (PV2). It can be observed that it reaches the maximum in 1994.1, the slope turns reverse and takes a reverse- U shape after this point.

Generally, the researches are provided with high frequency series with seasonal variations. Therefore, the series include both unit root and seasonal unit root. The test of seasonal integration in high-frequency series has become an important subject in recent years. Metin (1995) explains that a number of tests are available. The seasonal unit root tests that are recommended by Hyllerberg, Engle, Granger and Yoo (HEGY-1990) are employed. Seasonal unit root is tested with three different models. Model A contains only the constant term; Model B contains both constant term and seasonal dummy. Model C on the other hand, contains constant term, seasonal dummy and trend variable.

$$y_{4(t)} = \sum_{i=1}^{k} \alpha_i S_{i(t)} + \pi_1 y_{1(t-1)} + \pi_2 y_{2(t-1)} + \pi_3 y_{3(t-1)} + \pi_4 y_{3(t-1)} + \sum_{i=1}^{k} \varphi_i y_{4(t-i)} + e_t \qquad (3)$$

S represents seasonal dummy and equation 3 is estimated by the ordinary least square method. As long as t:π_1 is less than 5 percent critical value, $\pi_1=0$ is accepted; i.e., “seasonal unit root exists” is accepted. As it has been observed in Table 1, all series, except r, contain unit root in Model A. t: π_2 tests half-year seasonality. “Half-year seasonality exists” has been rejected for all series in all models. If F:$\pi_3=\pi_4=0$ is less than the critical value, “yearly seasonality exists” is accepted. Accordingly, all series except y do not contain yearly seasonality unit root in Model B. As a conclusion, it has been accepted that all series contain seasonal unit root, but half-year seasonality and yearly

seasonality have been rejected.

Table 1: HEGY Unit Root Tests

	Model A			Model B			Model C		
Variables	$t(\pi_1)$	$t(\pi_2)$	$F(\pi_3 \cap \pi_4)$	$t(\pi_1)$	$t(\pi_2)$	$F(\pi_3 \cap \pi_4)$	$t(\pi_1)$	$t(\pi_2)$	$F(\pi_3 \cap \pi_4)$
y	-0.95	-3.90	13.14	-2.01	-2.24	1.41	-2.61	-4.17	13.95
M2	0.33	-5.93	14.91	-0.66	-4.74	5.61	-1.25	-5.87	14.07
r	-3.12	-5.87	11.03	-3.28	-6.13	10.96	-3.29	-5.94	11.57
x	-1.67	-3.82	24.63	-1.48	-2.83	32.85	-1.75	-3.65	23.62
v2	-1.36	-3.99	21.35	-0.48	-2.60	4.15	-1.11	-3.74	19.06
*	-2.95	-2.94	6.57	-3.47	-1.94	2.98	-3.53	-2.94	6.60

* 5 percent significant level critical values. Taken from Hyllerberg, Engle, Granger and Yoo (1990) Table 1a and 1b.

3.2. Cointegration Analysis

The cointegration analysis that has been developed by Johansen (1988, 1991) and Johansen and Juselius (1990, 1992) is utilized, which makes possible the estimation by maximum likelihood multivariate cointegration technique. According to Hansen and Juselius (1995), this method makes testing various hypotheses possible and more appropriate as compared to the other methods even if some variables are I(0). Cointegration analysis have been extensively employed in recent years in testing models since it shows that linear combination of time series may be stationary even though at least two series are nonstationary. Therefore, it is a useful method to test whether stationary long-term relation(s) exists or not in the model.

In order to explain the Johansen method, let us define a vector autoregressive process for z_t series with p-dimension, in k th degree;

$$z_t = A_1 z_{t-1} + ... + A_k z_{t-k} + \mu + \Psi D_t + \varepsilon_t \qquad t = 1,.....T, \quad (4)$$

μ is a constant, D_t is dummy and ε_t is a "white noise" process with covariance matrix Ω and is nonsingular. Error correction model can be obtained by the first differences of equation 4 and that provides information about the size of correction from disequilibrium to long-term equilibrium. Equation 5 shows this relation.

$$\Delta z_t = \Gamma_1 \Delta z_{t-1} + ... + \Gamma_{k-1} \Delta z_{t-k+1} + \Pi z_{t-1} + \mu + \phi D_t + \varepsilon_t, \quad (5)$$

Cointegration hypothesis can be constructed as a reduced rank of II matrix.

$$H_1(r) = \Pi = \alpha\beta',$$

i) if Π has full-rank, then z_t is stationary, ii) if Π's rank is zero, then z_t is the first differences vector autoregressive process, iii) if rank (Π)=r p, then $\Pi = \alpha\beta'$, α and β' are two matrices with rank r and dimension (pxr). Rows of matrix β' form r different cointegration vector. This makes testing the estimation of models and their economic interpretations possible.

$H_1(r)$ hypothesis, even though Δz_t is stationary and z_t is nonstationary, $\beta' z_t$ is stationary. Although cointegration matrix β is nonsingular, β's column space is singular. The element of matrix β shows the long-term effects of variables at equilibrium. On the other hand, the element of matrix α shows the speed of adjustment of variables at long-term. In order to determine Π's rank, trace statistics (λ_{trace}) and max statistics (λ_{max}) for maximum eigenvalues are used for Johansen's maximum likelihood ratio.

The first practical bottlenecks in the Johansen method is the determination of maximum lag length, k. A residual-based Ljung-Box (LB) test in the determination of lag length in the VAR model is employed. [5] Starting with k=1 and increasing k, lag length has been determined until reaching an unimportant Ljung-Box Q autocorrelation statistics belong to ε_t. LB test results are given in Table 2. Optimum lag length is determined as 3.

Table 2 also shows the existence of cointegration and the necessary max and trace values for determination of the number of the cointegration vectors. 10 percent level of significance is chosen since dummy variables may affect the power of tests in the negative direction. Moreover, the power of cointegration test is generally low. According to the two test results, the hypothesis on nonexistence of cointegration is rejected at 10 percent level of significance. According to trace and max tests, null hypothesis that the rank of Π matrix $r \geq 1$ is not rejected. Therefore, at least one cointegration vector exists among the variables.

[5] This method has been employed by Tsukuda and Miyakoshi (2000).

Table 2: v2 Cointegration Analysis

Cointegration Vectors (β′)				Speeds of Adjustment (α)			
v2	Y	r	x	v2	y	r	x
-1.388	-2.791	0.076	3.966	-0.037	0.020	-0.010	0.001
0.310	-6.474	-0.006	-1.274	0.004	0.001	0.002	0.001
7.208	1.032	-0.060	13.361	-17.373	-1.245	0.082	-0.022
2.436	-0.667	0.007	-6.202	-0.011	-0.014	-0.006	0.000

Eigenvalue	λ_{max}	λ_{trace}	H_0	$\lambda_{max}(.90)$*	$\lambda_{trace}(.90)$*
0.7561	80.43	91.87	r=0	17.14	43.84
0.1380	8.46	11.45	r≤1	13.39	26.70
0.0507	2.97	2.99	r≤2	10.60	13.31
0.0003	0.02	0.02	r≤3	2.71	2.71

Autocorrelation Tests:

LM(1)	p-val.	LM(4)	p-val.	L-B(14)	p-val.
21.375	0.16	16.781	0.40	200.468	0.10

Normality Test:	$x^2(8)$	p-val.
	5.807	0.67

	v2	y	r	x
Normalized β′	1.000	2.011	-0.055	-2.858
Speed of Adjustment	0.051	-0.005	24.109	0.015

* Critical values are taken from Johansen and Juselius (1990) Table A2.

The normalized cointegration vector with respect to the first element, velocity of money (v2), the long-term relation is written as

$$v2 = -2.01y + 0.06r + 2.86x$$

Income velocity is negatively related with income and positively related with opportunity costs. The sign of parameters are theoretically expected. An increase in income reduces the velocity. This negative relation depends on the condition in which income elasticity of M2 demand for money should be greater than 1. Kesriyeli and Yalç›n (1998) have found this relationship for Turkey. On the other hand, the concept of “money illusion” supports the findings in countries with high and persistent inflation. Keyder (1998), using

annual data, has found that income elasticity of demand for money was 1.41 for 1965-1996 (1.34 for 1965-1979, 0.10 for 1980-1996). Keyder also calculates the effect of income on v2 velocity as –0.41 for 1965-1996 (-0.34 before 1980, and 0.9 after 1980). Different parameters obtained in Keyder's work and this study in terms of v2 velocity for 1980-1996 might have resulted from employing different data and methods.

The effect of interest rate on velocity is measured as 0.06. Because, an increase in interest rate will cause a decline in M2 demand for money and therefore an increase in velocity of money. However, the effect of interest rate on velocity is considerably low. On the other hand, an increase in real exchange rate will also induce a decline in M2 demand for money and an increase in velocity of money. Keyder (1998) points out that, as a result of change in regulations in 1984, Turkish citizens have deposited foreign exchange in the banks and therefore currency substitution has gradually increased since 1984. Depending on the rate of return on foreign exchange, a currency substitution from Turkish lira to foreign exchange has been observed. If the relative rate of return on foreign exchange increases, the demand for M2 with respect to GNP will decline and therefore M2 velocity will increase. As it has been explained in Section 3, an increase in exchange rate will make a positive impact on foreign trade balance and eventually income is expected to increase. Since income elasticity of M2 is greater than one, the data have not supported the expectation on negative relationship between real exchange rate and the velocity in the period of analysis in Turkey. Ülengin (1997) has reached similar conclusions with this finding. Ülengin, analyzing the period from 1983 to 1994, reaches the conclusion that an increase in real exchange rate has a positive contribution on trade balance in the short-run, but has no effect in the long run. Currency substitution has become an important characteristic of the Turkish economy since the ratio of foreign exchange deposits to total deposits in the banks raised from 13 percent in 1986 to 50 percent in 2000. This development may support the positive relationship between real exchange rate and the velocity.

When short-term parameters are included, error correction model can be written as,

$$\Delta v2_t = 1.97 + \phi D_t + \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2}$$

$$+0.05(v2_{t-3} - 2.01y_{t-3} + 0.06r_{t-3} + 2.86x_{t-3}) + \hat{e}_t$$

Here, Γ_1 = (0.41, -0.63, -0.00, 0.60), Γ_2 = (-0.02, -0.40, -0.00, -0.38), φ = (-0.48, -0.44, -0.39) and $\Delta X_t = (\Delta v2_t, \Delta y_t, \Delta r_t, \Delta x_t)'$.

The speed of adjustment is measured as 0.05, corroborating that the sign of this parameter is correct; and represents a slow level of adjustment; i.e., a short-run shock has a low speed of adjustment on the reversion back to long-run equilibrium level. According to Rose (1985), a low level of speed of adjustment corresponds to a high level of cost of adjustment. In brief, it can be argued that economic agents may only compensate for 5 percent of disequilibrium in each period.

IV. Conclusion

This study analyzes the stability of M2 income velocity in the Turkish economy by unit root test, HP filter test, and Johansen cointegration method. We have concluded that M2 income velocity was instable between 1986:1 and 2000:4 and that the size of instability was larger between 1986:1 and 1993:3. HP permanent components reveal that the data has a reverse-U shape and reach a maximum level in 1994:1.

Cointegration method has provided significant information on long-term relation between income velocity and its basic variables that have been strongly supported by trace and maximum statistics. The first element of cointegration vector is normalized β coefficients with respect to the velocity of money (v2) and the long-term relationship meets the theoretical expectations; i.e. the data support a negative relationship between income velocity and income, and a positive relationship between income velocity and interest rate; and income velocity and real exchange rate.

Another important finding shows that the real exchange rate effects M2 income velocity in the same direction. Instability in the exchange rate causes instability in income velocity and puts exchange rate into an important position in conducting monetary policy in Turkey. On the other hand, currency substitution during the period of the study effects the demand for money and therefore the stability of income velocity.

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Appendices

Appendix 1: Data Sources and Definition

y = real income, based on 1987 GDP, published by State Institute of Statistics; and 1988 data are taken from State Institute of Statistics (unpublished)
p= GDP deflator (1987)
r= interbank interest rate, taken from IFS 60b
M2= real money supply, published by The Central Bank, and deflated with GDP (1987) deflator.
x= real exchange rate. It is calculated by the formula that is also used by The Central Bank. The weight of US dollar and German mark is taken 0.5 and base year has been changed from 1995 to1987.

Figure 1: Graphs of Temporary Components

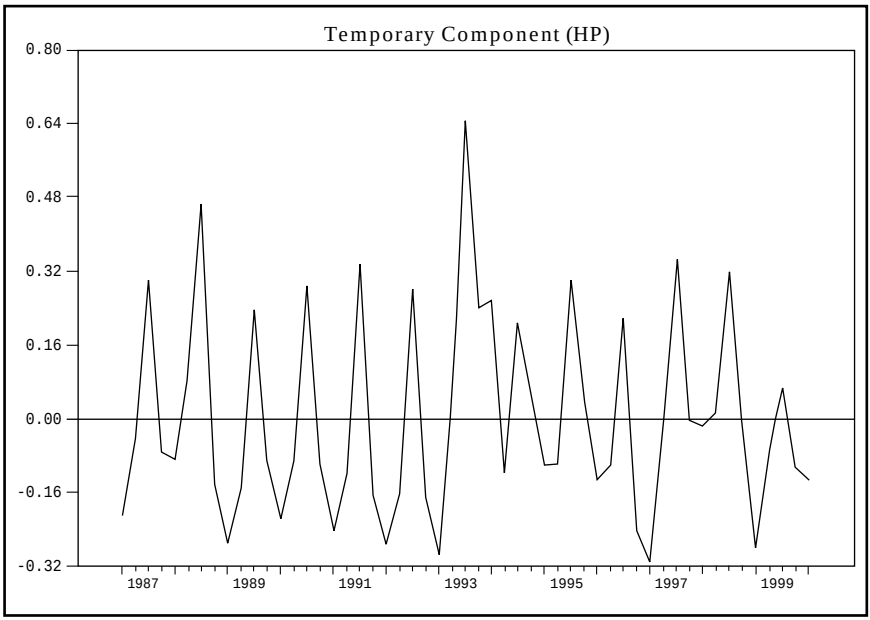
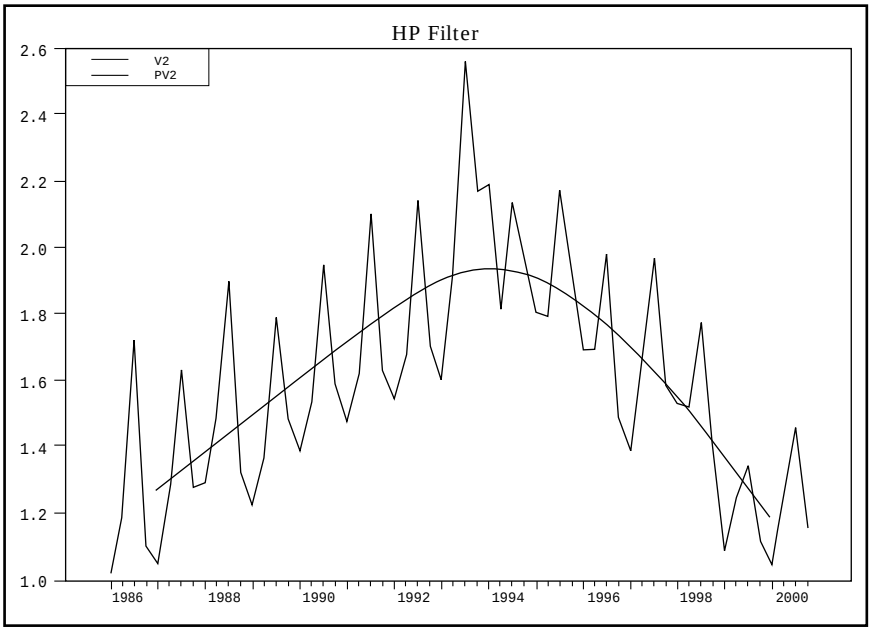


Figure 2: Graphs of Hodrik-Prescott Filter



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GLOBAL CAPITAL MARKETS

After a strong economic activity in the first quarter of 2002, concerns increased about the pace and sustainability of a recovery. This was due to downward revision of profit forecasts; concerns about the recovery has slowed down and the leading indicators–while still stronger than at end-2001 -have declined, except in emerging markets in Asia. The upturn in the United States is now expected to be weaker than earlier as the GDP growth in 2002 is pulled down significantly. In the euro area, domestic demand growth is likely to increase slower than previously expected. In Japan, where the economy appears to have bottomed out, GDP growth has been revised upward in both 2002 and 2003. However, with final domestic demand still weak, there are downside risks to the outlook given the appreciation of the Yen. In Latin America, the outlook has seriously deteriorated and output is expected to decline in 2002. In emerging markets in Asia, the recovery has so far proved stronger than expected, driven by the rebound in global trade and a nascent recovery in information technology, and in some countries– notably China, India, and Korea domestic demand. In the Middle East, while the outlook for oil prices is somewhat stronger, the forecast has remained broadly unchanged. The global growth is projected at 2.8 percent in 2002. Global financial markets have also weakened. Industrial country equity markets have fallen sharply since end-March. Equity markets in most emerging markets have descended over recent months, although developments in foreign exchange markets have been mixed.

The performances of some developed stock markets with respect to indices indicated that Nikkei-225 -100 increased by 12.2 %, DJIA, FTSE and GDAX decreased by –9.6 %, -11.7 % and –11.7 %, respectively at the end of June 2002 in comparison with the beginning of 2002. When US$ based returns of some emerging markets are compared in the same period, the best performer markets were: Indonesia (41.6 %), Thailand (38.3 %), Russia (38.1 %), Czech Rep. (20.2 %), S. Korea (19.1 %), S. Africa (16.6 %) and Hungary (14.8 %). In the same period, the lowest return markets were: Argentina (-64.6 %), Turkey (-41.3 %), Brazil (-36.9 %), Venezuela (-34.8 %) and Israel (-28.2 %). The performances of emerging markets with respect to P/E ratios as of end-June 2002 indicated that the highest rates were obtained in Korea (43.6),

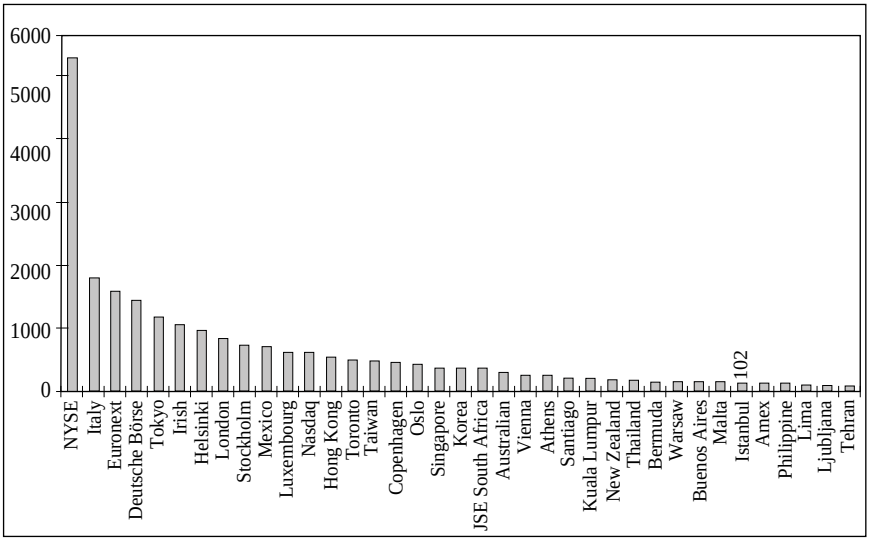
Malaysia (40.7), Philippines (33.6), Indonesia (30.7), Taiwan (25.4) and Turkey (24.9), and the lowest rates in Argentina (-9.1), Poland (6.0), Brazil (9.7) and Czech Rep. (10.1).

Market Capitalization (USD Million, 1986-2001)

	Global	Developed Markets	Emerging Markets	ISE
1986	6,514,199	6,275,582	238,617	938
1987	7,830,778	7,511,072	319,706	3,125
1988	9,728,493	9,245,358	483,135	1,128
1989	11,712,673	10,967,395	745,278	6,756
1990	9,398,391	8,784,770	613,621	18,737
1991	11,342,089	10,434,218	907,871	15,564
1992	10,923,343	9,923,024	1,000,319	9,922
1993	14,016,023	12,327,242	1,688,781	37,824
1994	15,124,051	13,210,778	1,913,273	21,785
1995	17,788,071	15,859,021	1,929,050	20,782
1996	20,412,135	17,982,088	2,272,184	30,797
1997	23,087,006	20,923,911	2,163,095	61,348
1998	26,964,463	25,065,373	1,899,090	33,473
1999	36,030,810	32,956,939	3,073,871	112,276
2000	32,260,433	29,520,707	2,691,452	69,659
2001	27,818,618	25,246,554	2,572,064	47,150

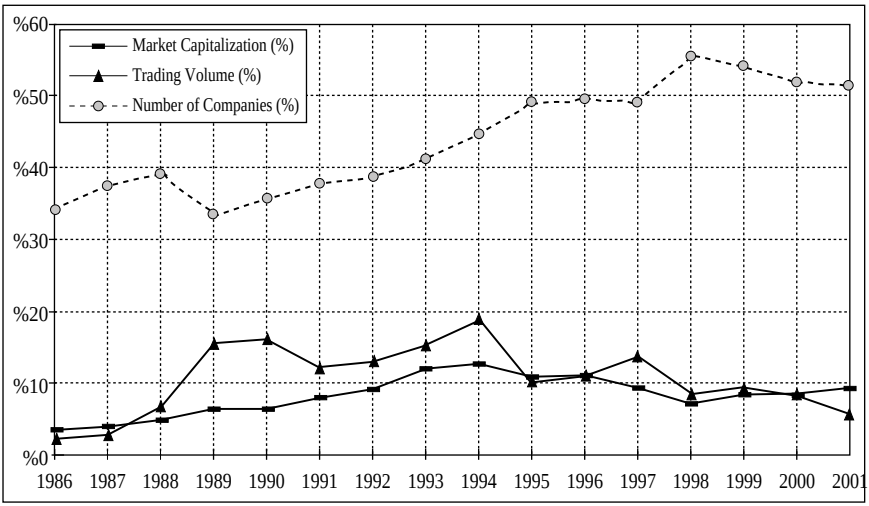
Source: IFC Factbook 2002.

Comparison of Average Market Capitalization Per Company (USD Million, June 2002)



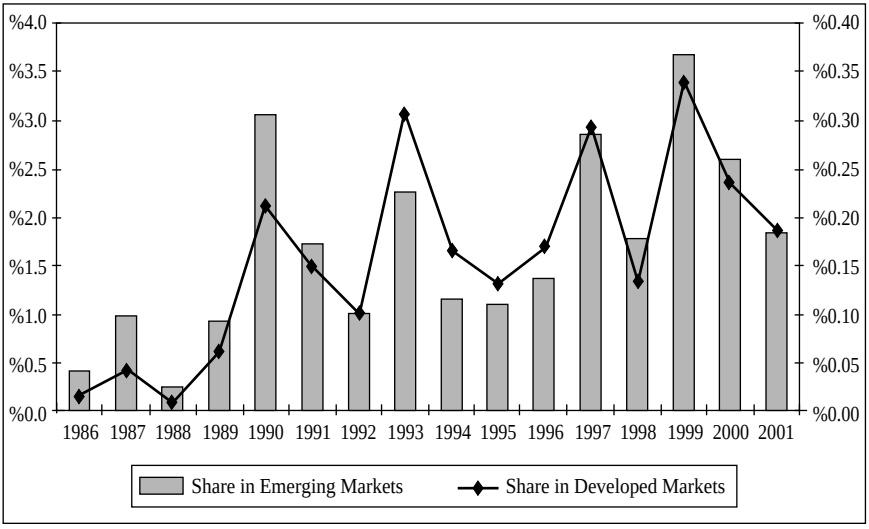
Source: FIBV, Monthly Statistics, June 2002.

Worldwide Share of Emerging Capital Markets (1986-2001)



Source: IFC Factbook, 2002.

Share of ISE's Market Capitalization in World Markets (1986-2001)



Source: IFC Factbook, 2002.

Main Indicators of Capital Markets (June 2002)

	Market	Value of Share Trading (Millions, US$) Up to Year Total (2002/1-2002/6)	Market	Market Cap. of Share of Domestic Companies (Millions, US$) June 2002
1	NYSE	5,273,423	NYSE	10,092,229
2	Nasdaq	4,176,182	Tokyo	2,498,020
3	London	2,058,887	Nasdaq	2,076,567
4	Euronext	1,024,491	London	2,032,174
5	Tokyo	821,337	Euronext	1,843,329
6	Deutsche Börse	655,674	Deutsche Börse	1,077,226
7	Taiwan	369,532	Toronto	631,502
8	Korea	338,953	Swiss Exchanges	562,510
9	Spanish Exchanges	331,428	Italy	524,809
10	Amex	313,270	Hong Kong	493,874
11	Swiss Exchanges	312,484	Australian	393,531
12	Italy	307,764	Taiwan	285,016
13	Chicago	293,470	Korea	246,880
14	Toronto	221,276	Stockholm	204,797
15	Bermuda	213,807	JSE South Africa	169,915
16	Stokholm	154,791	Helsinki	145,247
17	Australian	147,824	Kuala Lumpur	129,313
18	Hong Kong	108,898	Singapore	116,845
19	Helsinki	90,484	Mexico	115,038
20	Osaka	64,515	Copenhagen	91,701
21	JSE South Africa	38,761	Athens	82,744
22	Singapore	36,813	Oslo	76,328
23	Istanbul	31,846	Irish	71,641
24	Copenhagen	28,736	Amex	51,882
25	Sao Paulo	28,382	Thailand	50,229
26	Oslo	28,359	Santiago	49,056
27	Thailand	26,305	Tel-Aviv	45,288
28	Mexico	21,953	Jakarta	36,201
29	Kuala Lumpur	21,496	Istanbul	31,090
30	Irish	15,166	Vienna	29,503
31	Athens	11,766	Luxembourg	29,280
32	Jakarta	7,672	Warsaw	26,409
33	Tel-Aviv	6,665	Philippine	22,017
34	Warsaw	4,421	New Zealand	21,490
35	New Zealand	3,886	Bounes Aires	12,314
36	Budapest	2,868	Budapest	11,260
37	Vienna	2,848	Lima	10,720
38	Philippine	1,923	Tehran	9,587
39	Santiago	1,522	Ljubljana	4,770
40	TSX Venture	1,340	Bermuda	2,609
41	Buenos Aires	791	Colombo	1,498
42	Tehran	736	Malta	1,319
43	Ljubljana	625	Chicago	252

Source: FIBV. Monthly Statistics, June 2002

Trading Volume (USD millions, 1986-2001)

	Global	Developed	Emerging	ISE	Emerging/ Global (%)	ISE/Emerging (%)
1986	3,573,570	3,490,718	82.852	13	2.32	0.02
1987	5,846,864	5,682,143	164,721	118	2.82	0.07
1988	5,997,321	5,588,694	408,627	115	6.81	0.03
1989	7,467,997	6,298,778	1.169,219	773	15.66	0.07
1990	5.514.706	4,614,786	899,920	5,854	16.32	0.65
1991	5.019.596	4.403.631	615,965	8,502	12.27	1.38
1992	4.782.850	4,151,662	631,188	8,567	13.20	1,36
1993	7.194.675	6.090.929	1.103.746	21,770	15.34	1,97
1994	8,821,845	7,156,704	1.665.141	23,203	18.88	1,39
1995	10,218,78	9,176,451	1.042.297	52,357	10.20	5,02
1996	13,616,070	12,105,51	1.510.529	37,737	11.09	2,50
1997	19.484.84	16.818.17	2.666.647	59,105	13.69	2,18
1998	22.874.30	20.917.42	1.909.510	68,646	8,55	3,60
1999	31.021.065	28.154.198	2.866.867	81,277	9,24	2,86
2000	47.869.886	43.817.893	4.051.905	179,209	8,46	4,42
2001	42.076.862	39.676.018	2.400.844	77,937	5,71	3,25

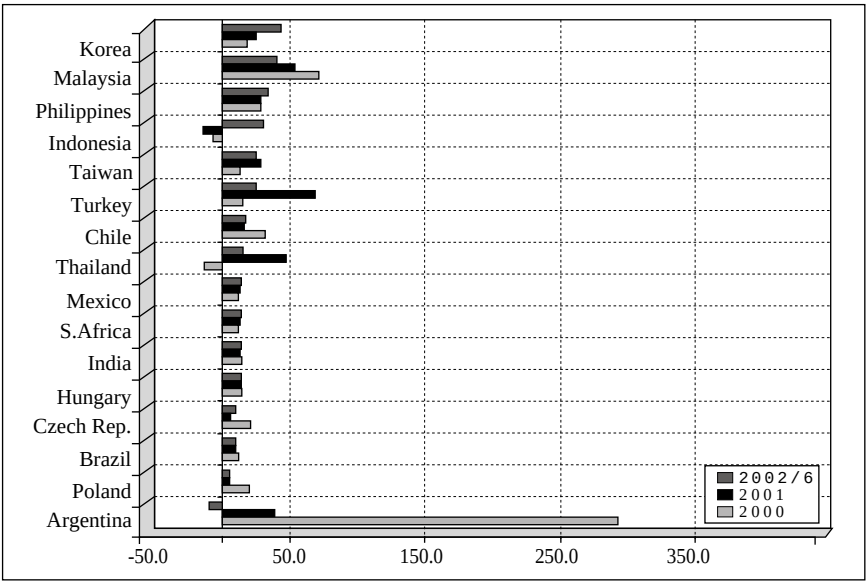
Source: IFC Factbook, 2002.

Number of Trading Companies (1986-2001)

	Global	Developed Markets	Emerging Markets	ISE	Emerging/ Global (%)	ISE/Emerging (%)
1986	28,173	18,555	9,618	80	34.14	0.83
1987	29,278	18,265	11,013	82	37.62	0.74
1988	29,270	17,805	11,465	79	39.17	0.69
1989	25,925	17,216	8,709	76	33.59	0.87
1990	25,424	16,323	9,101	110	35.80	1.21
1991	26,093	16,239	9,854	134	37.76	1.36
1992	27,706	16,976	10,730	145	38.73	1.35
1993	28,895	17,012	11,883	160	41.12	1.35
1994	33,473	18,505	14,968	176	44.72	1.18
1995	36,602	18,648	17,954	205	49.05	1.14
1996	40,191	20,242	19,949	228	49.64	1.14
1997	40,880	20,805	20,075	258	49.11	1.29
1998	47,465	21,111	26,354	277	55.52	1.05
1999	48,557	22,277	26,280	285	54.12	1.08
2000	49,933	23,996	25,937	315	51.94	1.21
2001	48,220	23,340	24,880	310	51.60	1.25

Source: IFC Factbook, 2002.

Comparison of P/E Ratios Performances 2000/12 - 2002/6



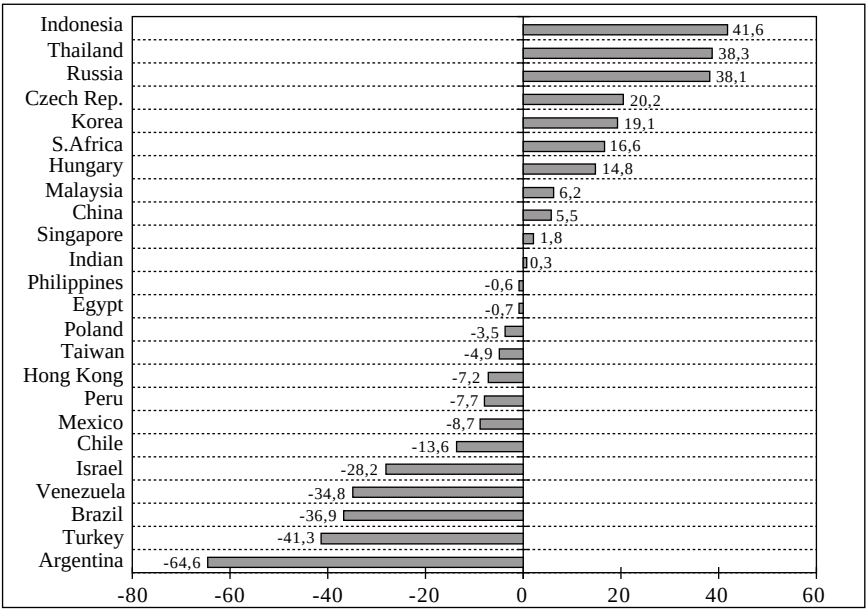
Source: IFC Factbook 2001. IFC, Monthly Review, June 2002.

Price-Earnings Ratios in Emerging Markets (1993-2002/6)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002/6
Argentina	41.9	17.7	15.0	38.2	17.1	13.4	39.0	293.3	38.4	-9.1
Brazil	12.6	13.1	36.3	14.5	15.4	7.0	25.1	11.7	8.9	9.7
Chile	20.0	21.4	17.1	27.8	15.9	15.1	37.7	31.8	17.1	17.8
Czech Rep.	18.8	16.3	11.2	17.6	8.8	-11.3	-14.8	21.0	5.6	10.1
Hungary	52.4	-55.3	12.0	17.5	25.2	17.0	18.2	14.3	13.3	13.0
India	39.7	26.7	14.2	12.3	16.8	13.5	22.0	14.8	12.3	13.3
Indonesia	28.9	20.2	19.8	21.6	11.2	-106.2	-10.5	-6.5	-14.1	30.7
Korea	25.1	34.5	19.8	11.7	11.6	-47.1	-27.7	19.3	24.9	43.6
Malaysia	43.5	29.0	25.1	27.1	13.5	21.1	-19.1	71.7	53.2	40.7
Mexico	19.4	17.1	28.4	16.8	22.2	23.9	14.1	12.5	13.2	14.2
Philippines	38.8	30.8	19.0	20.0	12.5	15.0	24.0	28.2	28.4	33.6
Poland	31.5	12.9	7.0	14.3	10.3	10.7	22.0	19.4	6.0	6.0
S.Africa	17.3	21.3	18.8	16.3	12.1	10.1	17.4	10.7	11.7	13.3
Taiwan, China	34.7	36.8	21.4	28.2	32.4	21.7	49.2	13.7	28.5	25.4
Thailand	27.5	21.2	21.7	13.1	4.8	-3.7	-14.5	-12.4	47.3	15.9
Turkey	36.3	31.0	8.4	10.7	18.9	7.8	33.8	15.2	69.5	24.9

Source: IFC Factbook, 2001; IFC, Monthly Review, June 2002.
Note: Figures are taken from IFC Investable Index Profile.

Comparison of Market Returns In USD (31/12/2001-3/7/2002)



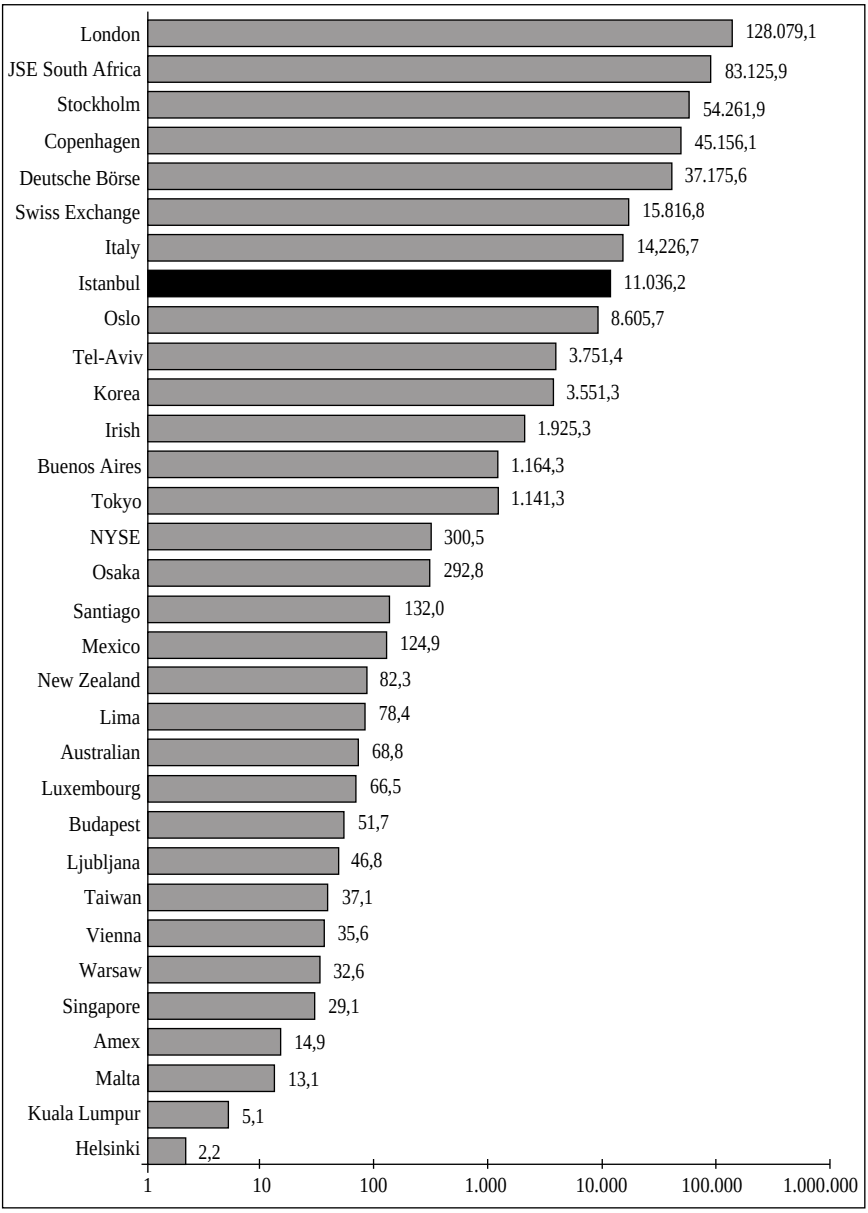
Source: The Economist, July 6th-12th 2002.

Market Value/Book Value Ratios (1993-2002/6)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002/6
Argentina	1.9	1.4	1.3	1.6	1.8	1.3	1.5	1.0	0.6	1.0
Brazil	0.5	0.6	0.5	0.7	1.1	0.6	1.6	1.4	1.2	1.2
Chile	2.1	2.5	2.1	1.6	1.6	1.1	1.8	1.5	1.4	1.3
Czech Rep.	1.3	1.0	0.9	0.9	0.8	0.7	1.2	1.2	0.8	0.8
Hungary	1.6	1.7	1.2	2.0	3.7	3.2	3.6	2.5	1.8	1.7
India	4.9	4.2	2.3	2.1	2.7	1.9	3.1	2.5	2.0	2.3
Indonesia	3.1	2.4	2.3	2.7	1.5	1.6	2.9	1.6	1.9	1.3
Korea	1.4	1.6	1.3	0.8	0.6	0.9	2.0	0.8	1.3	1.4
Malaysia	5.4	3.8	3.3	3.8	1.8	1.3	1.9	1.5	1.3	1.5
Mexico	2.6	2.2	1.7	1.7	2.5	1.4	2.2	1.7	1.7	1.7
Philippines	5.2	4.5	3.2	3.1	1.7	1.3	1.5	1.2	1.1	1.1
Poland	5.7	2.3	1.3	2.6	1.6	1.5	2.0	2.2	1.4	1.4
S.Africa	1.8	2.6	2.5	2.3	1.9	1.5	2.7	2.1	2.1	2.0
Taiwan, China	3.9	4.4	2.7	3.3	3.8	2.6	3.3	1.7	2.1	1.9
Thailand	4.7	3.7	3.3	1.8	0.8	1.2	2.6	1.6	1.6	1.9
Turkey	7.2	6.3	2.7	4.0	9.2	2.7	8.8	3.1	3.8	2.4

Source: : IFC Factbook, 1996-2001; IFC Monthly Review, June 2002.
Note: Figures are taken from IFC Investable Index Profile.

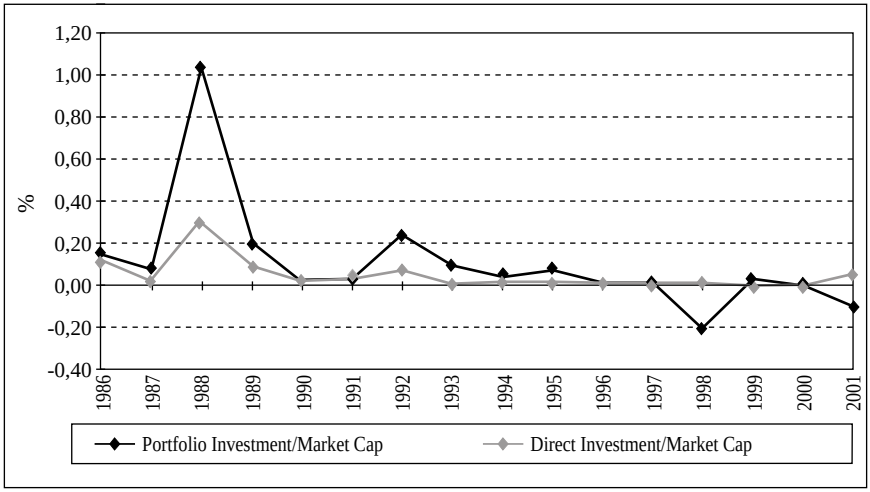
Value of Bond Trading
(Million USD. January 2002-June 2002)



Source: FIBV, Monthly Statistics, June 2002.

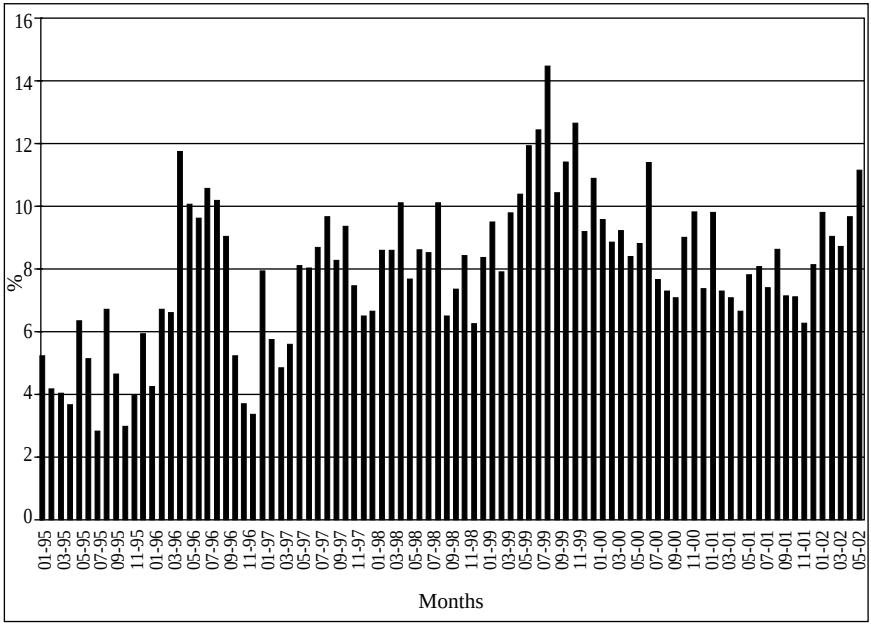
Note: The value of bonds trading pertain to Trading System View figures.For those countries which do not have Trading System View figures, the Regulated Environment figures are used.

Foreign Investments as a Percentage of Market Capitalization in Turkey (1986-2001)



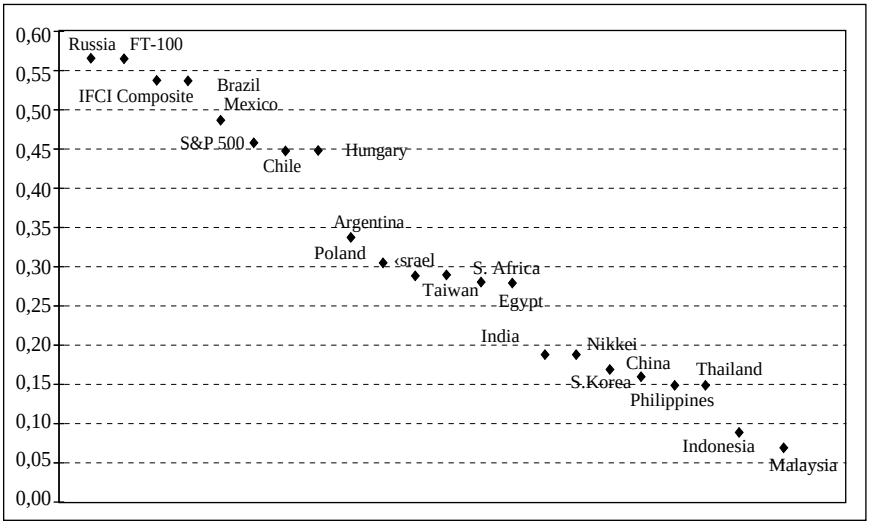
Source: ISE Data. CBTR Databank.

Foreigners' Share in the Trading Volume of the ISE (Jan. 95-June 2002)



Source: ISE Data.

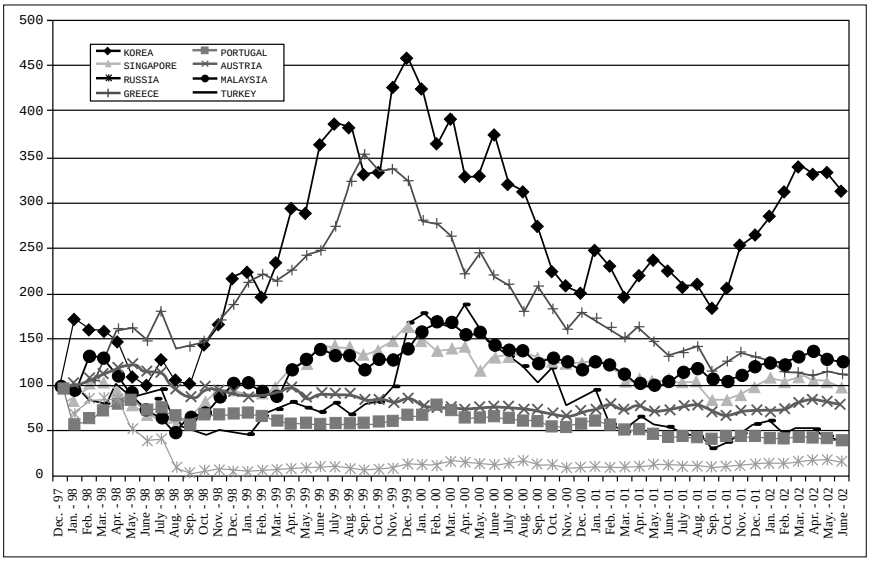
Price Correlations of the ISE
(June 1997- June 2002)



Source : IFC Monthly Review, June 2002.

Notes: The correlation coefficient is between -1 and +1. If it is zero. for the given period. It is implied that there is no relation between two series of returns.

Comparison of Market Indices
(31 Dec 97=100)



Source: Reuters.

Note: Comparisons are in US$.

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ISE
Market Indicators

STOCK MARKET

	Number of Companies	Traded Value				Market Value		Dividend Yield	P/E Ratios		
		Total		Daily Average							
		(TL Billion)	(US$ Billion)	(TL Billion)	(US$ Billion)	(TL Billion)	(US$ Billion)	(%)	TL (1)	TL (2)	US$
1986	80	9	13	—	—	709	938	9,15	5,07	—	—
1987	82	105	118	—	—	3.182	3.125	2,82	15,86	—	—
1988	79	149	115	1	—	2.048	1.128	10,48	4,97	—	—
1989	76	1.736	773	7	3	15.553	6.756	3,44	15,74	—	—
1990	110	15.313	5.854	62	24	55.238	18.737	2,62	23,97	—	—
1991	134	35.487	8.502	144	34	78.907	15.564	3,95	15,88	—	—
1992	145	56.339	8.567	224	34	84.809	9.922	6,43	11,39	—	—
1993	180	255.222	21.720	1.037	88	546.316	37.824	1,65	25,75	20,72	14,86
1994	176	650.864	23.203	2.573	92	836.118	21.785	2,78	24,83	16,70	10,97
1995	205	2.374.055	52.357	9.458	209	1.264.998	20.782	3,56	9,23	7,67	5,48
1996	228	3.031.185	37.737	12.272	153	3.275.038	30.797	2,87	12,15	10,86	7,72
1997	258	9.048.721	58.104	35.908	231	12.654.308	61.879	1,56	24,39	19,45	13,28
1998	277	18.029.967	70.396	72.701	284	10.611.820	33.975	3,37	8,84	8,11	6,36
1999	285	36.877.335	84.034	156.260	356	61.137.073	114.271	0,72	37,52	34,08	24,95
2000	315	111.165.396	181.934	451.892	740	46.692.373	69.507	1,29	16,82	16,11	14,05
2001	310	93.118.834	80.400	375.479	324	68.603.041	47.689	0,95	108,33	824,42	411,64
2002	306	43.527.477	31.904	351.028	257	49.293.803	31.436	1,27	—	—	—
2002/Ç1	309	24.857.113	18.382	414.285	306	57.824.887	43.254	1,26	93,13	108,29	100,57
2002/Ç2	306	18.670.364	13.522	291.724	211	49.293.803	31.436	1,27	—	—	—

Q: Quarter

Note:

* Between 1986-1992, the price earnings ratios were calculated on the basis of the companies' previous year-end net profits. As from 1993.

TL(1) = Total market capitalization / Sum of last two six-month profits

TL(12) = Total market capitalization / Sum of last four three-month profits

US$ = US$ based total market capitalization / Sum of last four US$ based three-month profits.

Closing Values of the ISE Price Indices

TL Based

	NATIONAL - 100 (Jan. 1986=1)	NATIONAL - INDUSTRIALS (Dec. 31.90=33)	NATIONAL - SERVICES (Dec. 27,90=1046)	NATIONAL - FINANCIALS (Dec.31.90=33)	NATIONAL - TECHNOLOGY (Jun. 30.90=14.466,12)
1986	1,71	—	—	—	—
1987	6,73	—	—	—	—
1988	3,74	—	—	—	—
1989	22,18	—	—	—	—
1990	32,56	32,56	—	32,56	—
1991	43,69	49,63	—	33,55	—
1992	40,04	49,15	—	24,34	—
1993	206,83	222,88	—	191,90	—
1994	272,57	304,74	—	229,64	—
1995	400,25	462,47	—	300,04	—
1996	975,89	1.045,91	1.,046,00	914,47	—
1997	3.451,–	2.660,—	3.593,—	4.522,—	—
1998	2.597,91	1.943,67	3.697,10	3.269,58	—
1999	15.208,78	9.945,75	13.194,40	21.180,77	—
2000	9,437,21	6.954,99	7.224,01	12.837,92	10.586,58
2001	13.782,76	11.413,44	9.261,82	18.234,65	9.236,16
2002	9.379,92	8.850,68	5.668,98	12.065,92	5.145,49
2002/Ç1	11.679,43	9.427,08	7.165,25	16.370,98	6.972,81
2002/Ç2	9.379,92	8.850,68	5.668,98	12.065,92	5.145,49

US $ Based

EURO Based

	NATIONAL - 100 (Jan. 1986=100)	NATIONAL - INDUSTRIALS (Dec. 31, 90=643)	NATIONAL - SERVICES (Dec. 27, 90=572)	NATIONAL - FINANCIALS (Dec.31, 90=643)	NATIONAL - TECHNOLOGY (Jun. 30,00=1.360.92)	NATIONAL - 100 (Dec. 31, 98=484)
1986	131,53	—	—	—	—	—
1987	384,57	—	—	—	—	—
1988	119,82	—	—	—	—	—
1989	560,57	—	—	—	—	—
1990	642,63	642,63	—	642,63	—	—
1991	501,50	569,63	—	385,14	—	—
1992	272,61	334,59	—	165,68	—	—
1993	833,28	897,96	—	773,13	—	—
1994	413,27	462,03	—	348,18	—	—
1995	382,62	442,11	—	286,83	—	—
1996	534,01	572,33	572,00	500,40	—	—
1997	982,—	757,—	1.022,—	1.287,—	—	—
1998	484,01	362,12	688,79	609,14	—	484,01
1999	1.654,17	1.081,74	1.435,08	2.303,71	—	1.912,48
2000	817,49	602,47	625,78	1.112,08	917,06	1.045,57
2001	557,52	461,68	374,65	737,61	373,61	741,24
2002	348,09	328,45	210,38	447,77	190,95	410,26
2002/Ç1	508,38	410,34	311,89	712,60	303,51	683,05
2002/Ç2	348,09	328,45	210,38	447,77	190,95	410,26

Q: Quarter

BONDS AND BILLS MARKET

Traded Value

Outright Purchases and Sales Market

	Total		Daily Average	
	(TL Billion)	(US$ Billion)	(TL Billion)	(US$ Billion)
1991	1.476	312	11	2
1992	17.977	2.406	72	10
1993	122.858	10.728	499	44
1994	269.992	8.832	1.067	35
1995	739.942	16.509	2.936	66
1996	2.710.973	32.737	10.758	130
1997	5.503.632	35.472	21.840	141
1998	17.995.993	68.399	71.984	274
1999	35.430.078	83.842	142.863	338
2000	166.336.480	262.941	662.695	1.048
2001	39.776.813	37.297	159.107	149
2002	39.827.440	28.887	318.620	231
2002/Ç1	14.192.919	10.478	232.671	172
2002/Ç2	25.634.521	18.409	400.539	288

Repo-Reverse Repo Market

Repo-Reverse Repo Market

	Total		Daily Average	
	(TL Billion)	(US$ Billion)	(TL Billion)	(US$ Billion)
1993	59.009	4.794	276	22
1994	756.683	23.704	2.991	94
1995	5.781.776	123.254	22.944	489
1996	18.340.459	221.405	72.780	879
1997	58.192.071	374.384	230.921	1.486
1998	97.278.476	372.201	389.114	1.489
1999	250.723.656	589.267	1.010.982	2.376
2000	554.121.078	886.732	2.207.654	3.533
2001	696.338.553	627.244	2.774.257	2.499
2002	269.506.826	193.476	2.156.055	1.548
20021/Ç1	112.784.853	83.282	1.848.932	1.365
2001/Ç2	156.721.973	110.194	2.448.781	1.722

Q: Quarter

(*) The Second quarter includes April-June period

ISE GDS Price Indices (December 25-29, 1995 = 100)

TL Based

	30 Days	91 Days	182 Days	General
1996	103,41	110,73	121,71	110,52
1997	102,68	108,76	118,48	110,77
1998	103,57	110,54	119,64	110,26
1999	107,70	123,26	144,12	125,47
2000	104,84	117,12	140,81	126,95
2001	106,32	119,29	137,51	116,37
2002	107,05	120,83	138,19	123,99
2002/Ç1	106,60	120,76	142,23	124,04
2002/Ç2	107,05	120,83	138,19	123,99

ISE GDS Performance Indices (December 25-29, 1995 = 100)

TL Based

	30 Days	91 Days	182 Days
1996	222,52	240,92	262,20
1997	441,25	474,75	525,17
1998	812,81	897,19	983,16
1999	1.372,71	1.576,80	1.928,63
2000	1.835,26	2.020,94	2.538,65
2001	2.877,36	3.317,33	3.985,20
2002	3.281,30	3.944,90	4.970,20
2002/Ç1	3.076,72	3.632,78	4.576,96
2002/Ç2	3.281,30	3.944,90	4.970,20

USD $ Based

1996	122.84	132.99	144.74
1997	127.67	137.36	151.95
1998	153.97	169.96	186.24
1999	151.03	173.47	212.18
2000	148.86	169.79	231.28
2001	118.09	136.14	163.55
2002	123.81	148.85	187.54
2002/Ç1	136.17	160.78	202.57
2002/Ç2	123.81	148.85	187.54

Q: Quarter

ISE GDS Price Indices (January 02, 2001 = 100)

	TL Based				
	6 Months (182 Days)	9 Months (273 Days)	12 Months (365 Days)	15 Months (456 Days)	General
2001	101,49	97,37	91,61	85,16	101,49
2002	101,77	94,97	86,19	77,10	98,61
2002/Ç1	104,35	101,69	97,16	91,62	103,58
2002/Ç2	101,77	94,97	86,19	77,10	98,81

ISE GDS Performance Indices (January 02, 2001 = 100)

	TL Based			
	6 Months (182 Days)	9 Months (273 Days)	12 Months (365 Days)	15 Months (456 Days)
2001	179,24	190,48	159,05	150,00
2002	232,97	247,59	210,88	170,71
2002/Ç1	207,48	220,50	190,80	169,85
2002/Ç2	232,97	247,59	210,88	170,71
	US $ Based			
2001	7.34	7.79	6.62	6.14
2002	8.79	9.34	7.96	6.44
2002/Ç1	9.18	9.76	8.44	7.52
2002/Ç2	8.79	9.34	7.96	6.44

Q: Quarter

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Kitap Tanitimi

"The Exchange Traded Funds Manual", Gary L. Gastineau, John Wiley Sons Ltd., New York, 2002, pp. xiii-401.

The purpose of this book is to help a wide range of investors use "open-end" exchange traded funds (ETF's) intelligently and effectively. The principle objectives of this book are to help the reader to understand the reasons for ETF growth and to use ETF's profitably.

Chapter 1 focuses on the investor's need for help on three topics that will recur throughout the book: asset allocation and risk management, taxation and financial planning and ETF selection and evaluation. Chapters 2, 3 and 4 attempt to answer how the ETFs work, why the expense ratios tend to be low and how most of the funds manage to avoid significant capital gains distributions and other frequently asked basic questions by the investors. ETF's are also compared with other basket products e.g. conventional mutual funds, that often compete with them. Chapter 3 also cover the regulatory framework within which the open ETF operates, introduce the transaction and tax cost allocation functions of the in-kind fund share creation and redemption process and the arbitrage pricing mechanism which prevents meaningful premium or discount pricing of fund shares.

Chapter 5 provides ETF applications for investors and investment advisors. Some illustrations and a frame of reference for present and prospective ETF users are provided. Effective use of ETF'S will come naturally to investors who recognize the fund as a portfolio, not just of stocks, but of risks and rewards.

Chapter 6 addresses what has become the weak link in portfolio indexation: the structure of common stock benchmark indexes and the way they are used as templates for index funds. The indexes in use today have served relatively well in the past, and their development have contributed significantly to the growth of indexing, but there are signs of strain.

Chapter 7 explores the applicability of the ETF structure to fixed-income funds and the possibility of actively managed ETFs. This chapter will help the reader develop a greater understanding of the important features of existing ETFs that will be used in the same way or in modified form in new types of ETFs.

Chapter 8 provides a schematic to illustrate the distinctive features of liquidity, share trading characteristics, and market depth in exchange-traded fund shares. Most fund share orders are executed promptly and fairly in a highly liquid, highly transparent market; however there are important differences between the market in ETF shares and the market in stocks.

A number of structural issues and obstacles to investment success and the standard investment process practiced by experienced financial advisors around the world as they attempt to develop financial and investment plans for their clients and implement them in the form of specific portfolios are described in chapter 9. It begins with thoughts on developing an appropriate and useful relationship with an advisor.

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