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The Paper title "The Impact of Tax Regimes on the Development of Private Pensions of the Capital Market" by **Çağatay Ergenekon** has been misprinted and should be corrected as "The Impact of Tax Regimes on the Development of Private Pension Funds: Reflections on the Capital Market".

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THE BID-ASK SPREAD AND ITS DETERMINANTS FOR STOCKS TRADED ON THE ISTANBUL STOCK EXCHANGE

Zeynep ÖNDER and Z. Nuray GÜNER*

Abstract

This paper examines the bid-ask spread and its determinants in the Istanbul Stock Exchange (ISE). The sample of 198 stocks is analyzed for a period from June 1996 to May 1997. The proportional spread is found to be an important part of the transaction costs compared to the brokerage fees in Turkey. Even though there is no market maker in the ISE, the change in the proportional spread across volume and market value quintiles are similar to that observed in the markets with market makers. A negative relationship between measure of volume and proportional spread is observed. The spread in the afternoon session is found to be significantly higher than that in the morning session. Public's inelastic demand to trade near the closure and information-related trading at the end of the day are considered to be explanations for the observed higher spread at the end of the day.

I. Introduction

The bid-ask spread is an important component of transaction costs in all markets. In theoretical papers, the bid-ask spread is modeled to compensation the market maker for holding an undiversified portfolio position, cost of executing orders submitted by investors and the risk of trading with investors having superior information about security prices. Although there is an enormous amount of research on the bid-ask spread and its three components, i.e. inventory holding, order processing and adverse selection[1], in the United States markets (Roll (1984), Glosten and Harris

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[1] The adverse selection is the risk of trading with investors having more information about the security prices than the market maker.

(1988), Stoll (1989), George, Kaul and Nimelandran (1991), Hasbrouck (1991), Lee, Ready and Mucklow (1993), Affleck-Graves, Hedge and Miller (1994), Chen, Christie and Schultz (1995) and Lin, Sanger and Booth (1995)), this issue has rarely been examined in emerging markets which usually have different structures and characteristics compared to mature markets (Bonser-Neal, Linnan and Neal (1996)). The difference between transaction costs of the NYSE and the NASDAQ (1.24 percent and 2.94 percent, respectively[2]) which have different market structures makes one believe that the transaction costs in an emerging market could be quite different from those in mature markets as well.

The Istanbul Stock Exchange (ISE) is one of the emerging markets which has been attracting the attention of more international money managers recently. The ISE is a completely automated competitive order matching market and there are no market makers. Investors as a group make the market in stocks listed on the ISE. As a result, the adverse selection and inventory risks are shared by a large number of investors, possibly resulting in an efficient pooling of risk. Hence, the importance of bid-ask spread as a component of trading costs decreases. On the other hand, in theoretical models, the market makers are modeled to be risk neutral whereas investors are risk averse. In markets with no market maker, risk would be shared inefficiently by risk averse traders thus, the bid-ask spread would be higher. Furthermore, the low market capitalization and the small investor base of the ISE may cause bid-ask spread to be an important part of the transaction costs. Therefore, it is difficult to make predictions about the size of spread in an emerging market with fully automated trading system based on theoretical models. It has to be determined empirically.

This paper studies the bid-ask spread and its determinants for a sample of 198 stocks listed on the National Market of the ISE which has two trading sessions with a two-hour break between them. First, the size of bid-ask spread as a component of transaction costs in the ISE is determined. Second, spread and its individual determinants are studied using cross-sectional regressions.

The average spread is found to be 1.84 percent of the price and it does not show much variability across stocks. This is very similar to the size of bid-ask spread observed for stocks listed on the NYSE (Huang and Stoll (1995) and Lin, Sanger and Booth (1995)) but smaller than the proportio-

[2] See Lin, Sanger and Booth (1995) and George, Kaul and Nimelandran (1991).

nal spread reported for the NASDAQ securities (George, Kaul and Nimelandran (1991)). Compared to brokerage fees, which run around 0.4 percent, the quoted bid-ask spread constitutes a large portion of the transaction cost in the ISE. Furthermore, the bid-ask spread in the afternoon trading session is found to be statistically higher than that in the morning session. Since transaction costs directly affect return on investment, investors can increase their return by just changing the session that they trade. The cross-sectional differences in proportional spread are also examined for size and volume quintiles and found that proportional spread, in general, decreases as both volume of trading or size of the firm increases. This finding is consistent with earlier theoretical models and results of empirical studies. Results of regression analyses support findings in univariate analyses.

The paper is organized as follows. The following section presents the trading mechanism in the ISE. The methodology employed in the analyses is explained in the third section. The fourth section explains the sampling procedure and data sources. Descriptive statistics on several variables used in the analyses are presented in the fifth section. Moreover, regression results explaining the bid-ask spread are discussed in this section. The final section summarizes and concludes the paper.

II. Trading Mechanism at the ISE

The ISE has several characteristics that are different from the exchanges in the US which are studied both empirically and theoretically. First, unlike the exchanges in the US, there is no market maker or specialist assigned to stocks traded on the ISE. Investors by submitting limit orders act like market makers and provide liquidity in this market. There is competition among traders in setting prices, and traders do not need to hold inventories in order to make the market. Therefore, the spread can be expected to be lower in this market. On the other hand, if market makers are less risk averse than the investors jointly making the market for the ISE stocks, then the bid-ask spread would be high in the ISE.

Second, the ISE has two trading sessions with a two-hour break in between them. This characteristic of the ISE allows us to study the impact of short break on the information production and the size of bid-ask spread. In contrast to the overnight break, this two-hour break in the middle of the day may not reduce investor's incentives to collect information since investors can act quickly on the information collected during this day-break. In addition, it may give investors time to better analyze the informati-

on arrived to the market during the previous trading period. As a result, more information-based trading in the afternoon session than the morning session can be expected. Since the bid-ask spread is considered and modeled to be an increasing function of the asymmetric information, spreads observed in the morning trading session is expected to be different from that in the afternoon session.

Third, the maximum allowable price change from one transaction to the other, tick size, is a function of the security's price. These tick sizes range from 1 percent to 2.5 percent of the price of the security and they put a limit on the size of bid-ask spread.[3]

III. Methodology

To study the differences between transaction costs in two sessions of the ISE, we use univariate analysis and cross-sectional regressions. In univariate analysis, we test whether spread differs between two trading sessions. Furthermore, we form market value and volume quintiles in order to see how spread varies across quintiles.

To study cross-sectional differences in spread, regression analysis is used. Earlier research has documented that the proportional spread decreases with the level of trading activity (Demsetz (1968), and Cohen, Maier, Schwartz and Whitcomb (1981)) and stock prices (Demsetz (1968) and Stoll (1978)), and increases with price volatility (Copeland and Galai (1983), and Easley and O'Hara (1987)). Therefore, the following two regressions are run for the sample stocks:

$$SPR_j = \alpha + \beta_1 * MCLOSE_j + \beta_2 * SR_j + \beta_3 * LMVAL_j + \beta_4 * VOLUME_j + \varepsilon_j$$

$$SPR_j = \alpha + \beta_1 * MCLOSE_j + \beta_2 * SR_j + \beta_3 * LMVAL_j + \beta_4 * VOLUME_j + \beta_5 * S + \varepsilon_j$$

In these equations SPRj is the quoted bid-ask spread for security j. It is calculated in two different ways. The first one is relative to the closing prices in each session, this is called as the proportional spread. The other one is the Turkish Lira (TL) spread, which is simply the difference between ask and bid prices. MCLOSEj is the average closing price for security j during our sample period, SRj is the standard deviation of returns calculated using mid-points of bid and ask prices. LMVALj is the logarithm of the market value of proportion of shares held by public and VOLUMEj is

[3] In the appendix, minimum price changes allowed at different price levels are presented.

a trading activity measure. Several trading activity measures such as average volume, (MVOL), average trade size per day, (MAVTS), turnover rate, measured by the ratio of total trading volume to total number of shares held by public, (TURN), and daily average number of transactions, (MNT) are used in these regression equations. A dummy variable, S, taking a value of 1 for the afternoon session and 0 for the morning session, is introduced to the system to see if spread differs between sessions after controlling for other factors that might affect the spread as well. Based on the previous studies, it is hypothesized that there is a negative relationship between spread and measures of volume controlling for the price and variability of stock prices. Furthermore, the larger the size of the firm, it is more likely to be traded. Therefore, the bid-ask spread for large firms will be lower controlling for price and variability of returns on stock.

IV. Sample Selection Criteria and Data

There are no market makers in the ISE, hence, the best buy and sell orders left in the book at the end of each trading session are taken as bid and ask prices. Our sample covers a period from June 1996 to May 1997.[4] Bid and ask prices for each session are hand collected from Dünya, a daily newspaper, for each security traded on the ISE till January 1997.[5] Bid and ask prices and the number of trades in the second part of our sample are obtained from databases maintained by REUTERS Ltd.[6] Closing prices and number of shares traded for each session are obtained from the ISE.

Several papers showed the relationship between spread, and trading volume and size of the company (Easley and O'Hara (1987), Glosten (1994) and De Jong, Nijman and Roell (1995)). In order to examine whether size of the spread differs with respect to volume and size, the ISE stocks are classified into quintiles based on trading volume or size. The firms which have stocks traded on the ISE are not owned 100 percent by the public. If the proportion of shares held publicly is quite low for a company, trading in its stock is expected to be low. Therefore, the market value of the shares held by public is taken to be a better measure of the size

[4] Dünya, a daily newspaper published this information starting from June 1996.

[5] Unfortunately, the data for this period is prone to human error.

[6] Our sample covers a period of one year. It could be extended to a longer period by hand collecting bid-ask prices from either daily bulletins of the ISE or the Dunya newspaper. The other alternative would be downloading the bid-ask prices from the databases maintained by the Reuters Ltd at the end of every trading session. Given the difficulty of hand collecting the data and the network connection problems, data over short sample period is analyzed in this explanatory study to get idea about the transaction costs in the ISE.

of the company than the total market capitalization of the firm. For that reason, the market capitalization and the proportion of shares held publicly are collected from the weekly bulletin of the ISE and used to calculate the market value of shares held by the public. Furthermore, stock splits seemed to be very common on stocks traded on the ISE. The high incidence of splits observed on the ISE can be explained by inflation rate, which runs around 75% annually, of Turkey.[7] It is almost impossible to find a security that did not have a split during any given year. Prices and trading volume are adjusted for stock splits and stock dividends. To adjust prices and trading volume, information on stock splits, stock and cash dividends are obtained from the monthly bulletin of the ISE.

During the first part of our sample period, June 1996-December 1996, Dünya newspaper skipped publishing bid and ask prices for afternoon sessions on Thursdays. To reduce the amount of data loss, it is assumed that the bid and ask prices for a security centered around its closing price on these days.[8] Namely, the bid and ask prices for those days are determined using the following equations:

$$bid_j = close_j - price\ step_j$$

$$ask_j = close_j + price\ step_j$$

Several filters were imposed on the data. As of end of May 1997, there were 242 securities traded on the ISE. A stock listed on the ISE could be trading in three different markets; the National Market, the Regional Market or the Watch List Companies Market. Because of the differences in microstructures and characteristics of stocks trading in these markets, we constrained our sample to stocks listed on the National Market.[9] Furthermore, we required the stocks to be traded on the ISE since the beginning of our sample period. As a result, our sample consists of 198 stocks listed on the ISE during June 1996 and May 1997.

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[7] Keeping the price within a reasonable price range is a common explanation given for stock splits. Because of high inflation, stock prices get out of that range quite frequently.

[8] To see the sensitivity of our results to this adjustment process, we dropped Thursdays from the sample. Results are qualitatively the same.

[9] Watch List Companies Market operates for only 15 minutes every day between 9:15 and 9:30 since November 27, 1996. The stocks of companies that do not satisfy the listing requirements of the ISE National Market or that are decided to be removed from the National Market by the Executive Council of the ISE are traded in the Regional Market (ISE (1997)). Because of the differences in the structure of these markets as well as the characteristics of the companies whose stocks are traded in these markets, stocks trading on the Regional and Watch List Companies Markets are not included in the sample.

V. Empirical Results

Table 1 shows the daily summary statistics on the bid-ask spread for our sample of stocks. Panel A is based on trading activity during the whole day whereas Panel B is based on activity during each trading session separately. The average proportional spread at the end of the day is found to be 1.84 percent of the average of bid and ask prices. This value is very close to the proportional spread reported for the NYSE stocks (Lin, Sanger and Booth (1995) and Huang and Stoll (1995)) but smaller than the proportional spread on the NASDAQ stocks (George, Kaul and Nimelandran (1991)).[10] The average proportional spread ranges between 1.41 and 3.02 percent. Considering the fact that the average brokerage fee is around 0.4 percent in Turkey, the bid-ask spread constitutes a large portion of the transaction costs.[11] The average TL spread is 244 TL for the stocks in our sample.[12] The variability of TL spread is much higher, it ranges between 16TL and 4,255TL.

Descriptive statistics on other variables are also presented in Table 1. For example, the average trade size is around 35 lots[13] and on average 238 transactions occur every day. The proportion of shares open to public is, on average, 34.1 percent for the sample firms and it ranges from 0.3 percent to 99 percent. This finding suggests that the total market value capitalization is not an appropriate measure to classify firms into size groups. Hence, in our analysis, total market value capitalization is adjusted by the percentage of shares held by the public.

To see if there is any difference between frequently and less frequently traded stocks in the ISE, stocks are grouped into five quintiles based on daily average number of trades.[14] Table 2 Panel A presents the descriptive statistics for each volume quintile. The proportional spread is slightly higher for the less frequently traded stocks. The mean proportional spread is 2.1 percent in the least frequently traded stocks but it declines monotonically to 1.7 percent for the most frequently traded stocks. One explanation for the difference in spread between the first and fifth quintile is that

[10] Lin, Sanger and Booth (1995) found that the average proportional spread is 1.24% for 150 NYSE stocks and George, Kaul and Nimelandrand (1991) showed that it is 2.94% for NASDAQ securities.

[11] In the US markets, the average commission rate is ranging between 1 to 10 percent depending on the price of the stock and size of transaction (Sharpe, Alexander and Baily p.71).

[12] The spread is approximately $0.30 per share for the securities of large, actively traded companies (Sharpe, Alexander and Bailey, 1995).

[13] In general, one lot is 1,000 shares.

[14] We also create five quintiles based on their volume of trade, the results are found to be similar.

investors are more likely to trade based on information in the less frequently traded stocks than more frequently traded stock. Hence, in order to protect themselves from adverse selection effects, investors in the ISE give bid and ask prices with larger spreads. Interestingly, in the less frequently traded stocks, the percentage of shares open to the public is higher than the other quintiles. The stocks of firms with high proportion of shares held by the public are expected to trade more frequently. One explanation for less frequent trading in these stocks, is that some domestic or foreign institutional investors might be holding a large portion of these stocks for the long-term investment purposes. As a result, there will be less shares available for trading in the market.

Panel B shows the descriptive statistics of the variables for market value quintiles. A negative relationship between the size of the firm and the proportional spread is expected. The market value is measured as the market value of the proportion of a firm's shares held by the public. Although we did not observe a monotonic decline in the proportional bid-ask spread across market value quintiles, there is a 0.19 percent difference between spreads in the highest and the lowest market value quintiles. However, the TL spread increases as the market value of the firm increases, in general, due to increase in closing prices.

Table 3 presents the results of testing two groups of hypotheses. The first group tests the equality of mean spread and means of other variables, used in explaining differences in the spread, between two trading sessions. The second group of hypotheses tests whether variances of these variables are same in two trading sessions. We fail to reject the second group of hypotheses for all the variables. On the other hand, the first group of hypotheses is rejected only for the mean proportional spread. The difference in percentage spread in the morning and the afternoon trading sessions is 0.2 percent. Even though the difference in percentage spreads is small to claim economic significance, the mean proportional spread at the end of the morning session is significantly less than the mean proportional spread at the end of afternoon session. This will give us an idea about the behavior of the bid-ask spread during the day.

Although we have only two observations per day, it seems that at the end of the day, the spread in the ISE is higher as in the NYSE (McInish and Wood, 1992). This behavior of the spread is explained by either the market maker's exploitation of his monopoly power or the public's inelastic demand to trade near the closure (Brock and Kleiden, 1992). However,

the higher spread at the closing of the day in the ISE can not be explained by the strategies of market makers since there is no market maker in this market. We can explain the higher spread at the end of afternoon session relative to the end of morning session with inelastic demand to trade.[15]

Tables 4 and 5 present the regression results for two measures of spread used in this paper: proportional and TL spread. The independent variables are the closing price (MCLOSE), the standard deviation of the return calculated from the mid-point of bid and ask prices, (SRMID), the logarithm of market value adjusted using percentage of shares held by public, (LMVAL), and several measures of volume.

Table 4 presents the results for the proportional spread measure. The models explain approximately 25 percent of the variation in bid-ask spread. As expected, all measures of volume are negatively and significantly related with the proportional spread. As trading activity in each day or in each session increases, the bid-ask spread declines. The difference between the morning and the afternoon sessions are also observed in the regression analysis. The proportional bid-ask spread in the afternoon session is 0.20 percent higher than that in the morning session for stocks with the same volume, price, variability and market value. The positive and significant impact of market size on bid-ask spread is found when MAVTS and TURN are used as measures of volume. Moreover, the coefficients on the closing price and standard deviation of returns are significant in the models with LMVOL.

Table 5 presents the regression results for the TL spread. These regression models explain 99 percent of the variability in TL spreads. These models show that the most important factor in determining the TL spread is the stock price. A negative and statistically significant relationship between all volume measures, except mean of the daily average trade size, and the bid-ask spread is observed. Surprisingly, controlling the closing price, variability and market value, the TL spread in the afternoon session is significantly higher than that in the morning session as well, even though in univariate analysis the equality of the mean TL spread between the two trading sessions cannot be rejected. When MAVTS and TURN are used as measures of volume, like the proportional spread, TL spread increases as

[15] The investors will be anxious to trade to get back to their optimal portfolio positions right before the market closure because they don't want to bear the risk of holding portfolios that are not optimal overnight. Therefore, the demand at the closure will be less sensitive to the prices. The liquidity providers will take advantage of this inelastic demand by offering higher ask and lower bid prices at the closure, hence the bid-ask spread will be larger.

market value increases. However, standard deviation of returns does not significantly affect TL bid-ask spread.

VI. Summary and Conclusion

This paper studies the bid-ask spread and its determinants in the ISE, an emerging market, for a period from June 1996 to May 1997. The proportional spread is found to be an important part of the transaction costs compared to the brokerage fees in Turkey. Even though there is no market maker in the ISE, the change in the proportional spread across volume and market value quintiles are similar to that observed in the markets with market makers. Regression results support the findings in the univariate analyses. However, the relationship between the spread and other variables is not as monotonic in the ISE as in the markets that have market makers.

The spread in the afternoon session is found to be significantly higher than that in the morning session. The market maker exploiting his/her monopoly power cannot explain this finding because there is no market maker in the ISE. On the other hand, public's inelastic demand to trade near the closure might be a viable explanation. During the sample period, the ISE operates two sessions with a two-hour break between them. Since the market closes for a short period at the end of the first session, demand inelasticities of investors at the end of the morning session is expected to be lower than that at the end of the afternoon session, this will create the spread behavior observed in the ISE. This closure may also affect the information environments in two trading sessions. The morning session follows an eighteen hour long overnight break. On the other hand, the afternoon trading session is preceded by a short break in trading during business hours. Even though, Berry and Howe (1994) show that the arrival of public information to the market during the lunch break is low, this short-break in trading during business hours may not reduce the incentives of investors to collect private information since traders can trade on that information in a short period of time.[16] Therefore, the asymmetric information in the afternoon trading session might be higher than that in the morning session. Furthermore, the size of the spread in a market with no market maker would be mainly a function of adverse selection costs, since the non-existence of the market maker eliminates inventory holding and order

[16] Empirical evidence in support of this conjecture can be found in Güner and Önder (1998).

processing components of the spread to a minimum. This suggests that there could be more information-related trading at the end of the day, hence higher bid-ask spreads.

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Table 1. Daily Summary Statistics

Variables	Mean	Std Dev	Minimum	Maximum
Panel A - Within A Day (N=198)				
Proportional Spread (%)	1.841	0.232	1.409	3.022
TL Spread	244	499	16	4255
Closing Price	13,709	28,439	764	231,486
Mean Return	0.060	0.308	-0.952	0.780
Number of Shares Held by Public (in millions)	481	976	4	8250
Proportion of Shares Held by Public	34.128	20.700	0.29	99
Market Value or Shares Held by Public	6,631,497	18,869,351	49,300	168,300,000
Number of Shares Traded	11,291,011	17,025,577	265,353	105,354,166
Number of Trades	238	181	45	930
Average Trade Size	35,337	32,738	2,430	189,506
Panel B - Both Sessions (N=396)				
Proportional Spread (%)	1.744	0.242	1.306	3.022
TL Spread	233	476	14	4,255
Closing Price	13,719	28,426	764	232,334
Number of Shares Traded	5,645,506	8,527,819	121,187	54,683,621
Number of Trades	119	91	21	495
Average Trade Size	34,240	31,618	2,190	204,958

Table 2. Daily Statistics by Number of Trades and Market Value Quintiles

Panel A: Quintiles of Number of Trades

First Quintile (N=40)				
Variable	**Mean**	**Std Dev**	**Minimum**	**Maximum**
Proportional Spread (%)	2.076	0.257	1.585	3.022
TL Spread	216	224	16	897
Closing Price	10,928	12,186	764	51,628
Mean Return	0.122	0.274	-0.423	0.750
Number of Shares Held by Public (in millions)	252	362	18	2,123
Proportion of Shares Held by Public	40.325	27.411	7	98
Market Value or Shares Held by Public	3,638,553	6,403,987	79,900	36,010,687
Number of Shares Traded	1,648,621	1,247,012	265,353	5,554,940
Number of Trades	67	13	45	87
Average Trade Size	21,590	16,250	4775	72,922
Second Quintile (N=40)				
Proportional Spread (%)	1.871	0.163	1.642	2.400
TL Spread	480	938	18	4,255
Closing Price	26,403	51,854	940	231,486
Mean Return	0.045	0.340	-0.732	0.639
Number of Shares Held by Public (in millions)	333	740	4	4,500
Proportion of Shares Held by Public	29.275	18.381	9	99
Market Value or Shares Held by Public	7,508,550	25,915,470	143,550	163,426,500
Number of Shares Traded	4,372,058	5,569,203	291,528	24,985,604
Number of Trades	122	17	89	152
Average Trade Size	30,570	39,031	2,430	189,506
Third Quintile (N=40)				
Proportional Spread	1.846	0.221	1.522	2.613
TL Spread	130	93	27	397
Closing Price	7,085	4,999	1258	22,276
Mean Return	0.020	0.308	-0.952	0.545

Number of Shares Held by Public (in millions)	355	508	19	2,520
Proportion of Shares Held by Public	32.907	19.225	0.290	98
Market Value or Shares Held by Public	2,866,350	4,088,244	49,300	21,168,000
Number of Shares Traded	7,043,680	5,789,625	1,575,182	24,501,321
Number of Trades	192	27	157	240
Average Trade Size	32,026	24,602	8,604	107,852
Fourth Quintile (N=40)				
Proportional Spread	1.715	0.120	1.465	2.008
TL Spread	90	56	17	218
Closing Price	5,305	3,180	1,078	12,388
Mean Return	-0.012	0.294	-0.833	0.448
Number of Shares Held by Public (in millions)	394	402	15	1560
Proportion of Shares Held by Public	32.675	15.891	8	87
Market Value or Shares Held by Public	3,710,064	6,071,240	306,000	28,687,500
Number of Shares Traded	13,612,751	9,390,230	4,519,481	47,292,465
Number of Trades	286	28	241	337
Average Trade Size	42,604	29,174	13,169	160,890
Fifth Quintile (N=38)				
Proportional Spread	1.698	0.151	1.410	2.098
TL Spread	306	478	18	1,941
Closing Price	19,095	30,699	1,026	123,409
Mean Return	0.127	0.312	-0.864	0.780
Number of Shares Held by Public (in millions)	1,099	1,849	30	8,250
Proportion of Shares Held by Public	35.526	20.118	2	86
Market Value or Shares Held by Public	15,897,254	31,062,573	316,800	168,300,000
Number of Shares Traded	30,750,940	28,534,820	3,785,248	105,354,166
Number of Trades	537	169	338	930
Average Trade Size	50,664	41,810	8,254	166,384

Table 2- Continued.

Panel B - Quintiles of Market Value

First Quintile (N=40)				
Variable	**Mean**	**Std Dev**	**Minimum**	**Maximum**
Proportional Spread (%)	1.976	0.233	1.561	2.461
TL Spread	144	180	16	1054
Closing Price	7,293	9,605	764	58,581
Mean Return	0.058	0.331	-0.732	0.737
Number of Shares Held by Public (in million)	79	68	4	324
Proportion of Shares Held by Public	41.757	25.824	0.29	99
Market Value of Shares Held by Public	316,895	129,026	49,300	518,336
Number of Shares Traded	4,986,122	7,966,254	265,353	47,292,465
Number of Trades	142	81	50	360
Average Trade Size	28,950	31,310	2,505	160,890
Second Quintile (N=40)				
Proportional Spread (%)	1.814	0.205	1.465	2.347
TL Spread	173	378	20	2,419
Closing Price	9,684	21,565	1,002	138,045
Mean Return	0.026	0.302	-0.833	0.750
Number of Shares Held by Public (in million)	181	185	5	800
Proportion of Shares Held by Public	25.125	13.742	7	65
Market Value of Shares Held by Public	887,067	233,133	519,217	1,321,600
Number of Shares Traded	8,017,607	9,095,246	357,449	42,820,866
Number of Trades	195	100	46	401
Average Trade Size	31,129	24,930	2,519	106,194
Third Quintile (N=40)				
Proportional Spread (%)	1.804	0.247	1.496	3.022
TL Spread	111	87	24	328
Closing Price	6,191	4,550	1,410	19,051
Mean Return	0.041	0.226	-0.414	0.480

Number of Shares Held by Public (in million)	282	245	24	1,132
Proportion of Shares Held by Public	36.450	20.469	11	98
Market Value of Shares Held by Public	1,823,845	352,823	1,355,200	2,610,000
Number of Shares Traded	11,949,809	11,583,573	762,234	52,404,041
Number of Trades	250	139	56	614
Average Trade Size	40,139	27,282	8,604	118,755
Fourth Quintile (N=40)				
Proportional Spread (%)	1.830	0.248	1.409	2.613
TL Spread	303	665	18	3,911
Closing Price	17,015	37,720	1,026	216,609
Mean Return	-0.010	0.380	-0.952	0.585
Number of Shares Held by Public (in million)	528	546	15	2324
Proportion of Shares Held by Public	34.750	17.398	9	86
Market Value of Shares Held by Public	4,252,663	1,098,241	2,622,000	6,375,000
Number of Shares Traded	14,663,686	24,394,156	309,696	105,354,166
Number of Trades	250	179	49	718
Average Trade Size	38,361	37,238	3,312	166,384
Fifth Quintile (N=38)				
Proportional Spread (%)	1.786	0.175	1.543	2.261
TL Spread	501	749	27	4,255
Closing Price	29,133	42,638	1,258	231,486
Mean Return	0.189	0.255	-0.569	0.780
Number of Shares Held by Public (in million)	1,377	1,874	38	8,250
Proportion of Shares Held by Public	32.474	21.430	2	87
Market Value of Shares Held by Public	26,889,934	36,917,182	6,500,000	168,300,000
Number of Shares Traded	17,129,769	22,765,457	349,319	94,944,263
Number of Trades	359	274	47	930
Average Trade Size	38,253	40,805	2,430	189,506

Table 3-Test of the Hypotheses of the Equality of Means and Variances in Two Sessions (N=198)

Variables	Mean	Std. Dev	Minimum	Maximum	$H^0:\mu_1=\mu_2$ Prob>t	$H_0:\sigma^2_1=\sigma^2_2$ Prob>F'
Percentage Spread						
Session 1	1.645	0.210	1.306	2.901	0.000	0.172
Session 2	1.843	0.232	1.409	3.022		
T.L. Spread						
Session 1	221	453	14	3,877	0.640	0.179
Session 2	244	499	16	4,255		
Closing Price						
Session 1	13,729	28,485	769	232,334	0.995	0.982
Session 2	13,709	28,439	764	231,486		
Return						
Session 1	0.049	0.307	-0.947	0.760	0.741	0.972
Session 2	0.060	0.308	-0.952	0.780		
Number of Shares Traded						
Session 1	5,378,006	8,218,746	121,187	50,670,546	0.533	0.308
Session 2	5,913,004	8,838,830	144,167	54,683,621		
Number of Trades						
Session 1	112	86	21	434	0.164	0.188
Session 2	125	95	23	495		
Average Trade Size						
Session 1	33,551	30,811	2,190	166,215	0.665	0.463
Session 2	34,929	32,469	2,421	204,958		

Table 4 - Regression Results of Quoted Percentage Spreads for ISE stocks

Panel A: End of the Session N = 396								
	Parameter Estimates	**t-statistics**	**Parameter Estimates**	**t-statistics**	**Parameter Estimates**	**t-statistics**	**Parameter Estimates**	**t-statistics**
$\hat{a}$	1.094	7.697	2.125	18.455	2.286	19.848	1.862	16.707
MCLOSE (000 TL)	-1.649	-4.165	-0.188	-0.442	0.462	1.169	0.133	0.361
SRMID (%)	0.911	2.404	0.317	0.750	0.779	1.798	0.608	1.551
LMVAL	-0.003	-0.359	-0.031	-3.957	-0.046	-5.812	-0.009	-1.157
S	0.209	10.966	0.200	9.297	0.200	9.454	0.212	10.626
LMVOL	-0.094	-10.835						
MAVTS (million shares)			-1.153	-3.142				
TURN					-1.177	-4.730		
MNT							-0.001	-8.764
R-square (%)	38.820		22.350		24.720		33.490	
F-statistic	51.119		23.756		26.937		40.788	
Panel B: End of the Day N = 198 stocks								
$\hat{a}$	1.394	6.897	2.414	14.259	2.591	15.337	2.138	13.141
MCLOSE (000 TL)	-1.775	-3.037	-0.204	-0.324	0.474	0.812	0.113	0.207
SRMID (%)	0.724	1.290	0.085	0.135	0.616	0.958	0.406	0.700
LMVAL	-0.006	-0.551	-0.037	-3.126	-0.052	-4.499	-0.013	-1.095
LMVOL	-0.099	-7.771						
MDAVTS (million shares)			-1.125	-2.138				
TURN					-0.649	-3.525		
MDNT							-0.570	-6.338
R-square(%)	27.520		7.040		10.600		21.240	
F-statistic	19.700		4.732		6.838		14.279	

Table 5 - Regression Results of TL Spreads for ISE stocks

Panel A: End of the Session N = 396								
	Parameter Estimates	**t-statistics**	**Parameter Estimates**	**t-statistics**	**Parameter Estimates**	**t-statistic**	**Parameter Estimates**	**t-statistics**
$\hat{a}$	-92.417	-2.857	51.118	2.089	71.168	2.890	-4.606	-0.194
MCLOSE	16.472	182.548	16.694	184.909	16.761	198.539	16.709	211.837
SRMID (%)	40.493	0.469	-47.815	-0.533	22.672	0.245	23.849	0.285
LMVAL	0.566	0.328	-3.645	-2.156	-5.308	-3.168	1.291	0.770
S	24.276	5.587	22.873	5.016	22.988	5.090	25.404	5.977
LMVOL	-12.852	-6.517						
MAVTS (million shares)			-103.000	-1.323				
TURN					-161.897	-3.044		
MNT							-0.207	-7.967
R-Square (%)	98.180		99.090		99.120		99.220	
F-statistic	9539.011		8633.476		8800.538		10006.107	
Panel B: End of the Day N = 198 stocks								
$\hat{a}$	-73.015	-1.852	77.791	2.467	99.780	3.158	16.225	0.553
MCLOSE	17.262	151.306	17.519	149.285	17.586	161.131	17.527	178.286
SRMID (%)	3.476	0.032	-98.615	-0.842	-16.374	-0.136	-15.147	-0.145
LMVAL	0.289	0.133	-4.526	-2.061	-6.308	-2.914	1.091	0.523
LMVOL	-14.418	-5.771						
MDAVTS (million shares)			-91.880	-0.938				
TURN					-90.110	-2.615		
MDNT							-115.816	-7.146
R-square (%)	99.410		99.300		99.320		99.450	
F-statistic	8173.826		7030.109		7247.733		8862.459	

MCLOSE = mean closing price
SRMID = Standard deviation of return on mid-point of bid and ask prices
LMVOL = Logarithm of mean volume of trade
LMVAL = Logarithm of market value
MDAVTS = mean of the daily average trade size
TURN = turnover rate
MDNT = mean daily number of trades
S = Session indicator variable

Appendix

There are 10 price categories on the ISE. For each category the minimum price change allowed is specified. Changes in price of a security in any price categories should be multiples of the minimum price change for that price category. The minimum price changes for the price categories are listed below.

Stock Price	Minimum Price Change
10 - 1,000 TL	10 TL
1,025 - 2,500 TL	25 TL
2,550 - 5,000 TL	50 TL
5,100 - 10,000 TL	100 TL
10,250 - 25,000 TL	250 TL
25,500 - 50,000 TL	500 TL
51,000 - 100,000 TL	1,000 TL
102,500 - 250,000 TL	2,500 TL
255,000 - 500,000 TL	5,000 TL
510,000 TL and above	10,000TL

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AN INQUIRY ON THE EVIDENCE OF COMOVEMENTS AMONG VARIOUS STOCK MARKET RETURNS

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Abstract

This paper analyzes possible comovements among mjor financial market returns for the period between January 1986 and June 1997. The basic findings of this paper are; among the developed country stock exchanges only the US-UK appears to have a common movement in the long run; stock exchanges of Mexico and the Philippines reflect a "pivotal" character since their returns tend to cointegrate with a number of market returns representing different level of development and regional characteristics; markets of the same regions such as the Latin Region or the Far East Region show a comovement of returns while this is not true for Greece and Turkish stocak exchanges; further investigation related with the Japanese stock exchange should be carried on since the results pertaining to Japan might be an indication of international portfolios were used to be hedged on this market. This paper is important because it applies the state-of-the-art namely Dynamic Ordinary Least Squares over the returns of various stock markets and because it investigates the long run returns of the İstanbul Stock Exchange in relation with a number of stock markets.

I. Introduction

This paper aims at searching for the evidence of cointegrating relations between different stock markets of the world. To this end, a "Dynamic Ordinary Least Squares" approach is applied, as proposed in Stock and Watson (1993).

In quest of cointegration equations of the stock markets, first it is searched for the existence of stationarity in each individual index and then for the existence of cointegrating relation between the pairs of markets. Upon the stock market pairs, which reflect evidence of cointegration, Dynamic OLS method is applied in order to obtain the cointegration equ-

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ation coefficients. Finally as a mean to confirm the results, residuals of the cointegration equation is searched for the condition of stationarity.

There is a wide literature concerning the transmission of effects among the stock markets. Although this article do not aim to investigate the mechanism, rapidity or the extent of transmission of price volatility it, humbly, discusses about the evidence of comovements among the stock market indices of various countries reflecting different characteristics.

The following section explains about the data which is followed by the section reflecting the econometric methodology. Application of the method and the regression results are presented in section IV.

II. The Data

The data used in this research are the month-end local currency index values of different stock markets. The data was downloaded from the IFC Emerging Market Indices provided by DATASTREAM Ltd.

The stock markets analyzed in this paper are the USA (NYSE), Canada, the UK, Germany, Japan, Argentina, Mexico, Chile, Greece, Turkey, South Korea, Thailand and the Philippines. Of those, 5 are developed country-markets while the other markets are selected from the developing countries representing various regions on the world. Hence, different time zones, hemispheres, trading blocks and different levels of development, which might have effect on the way the impulses are transmitted among the stock markets, are represented in the data set.

The period of analysis extends between January 1986, when the Istanbul Stock Exchange started operation, and June 1997, the date just before the East Asian Crisis started. Thus, the task of detecting the behavior of the Istanbul Stock Exchange marks the beginning of the sample period. On the other hand, the upper limit is determined in reference to the recent Asian Crisis; since the volatility of the stock indices gained momentum by July 1998 the direct result of this development would be adding outliers to the analysis, which in turn would likely cause distorting effects on the results. Therefore, in order to control the effect of the outliers, instead of using dummies, it is preferred to truncate the sample period at the end of the first half of the year 1997.

The data is used in logarithmic form. Therefore, the coefficients obtained by the regressions must be interpreted accordingly. Another point to note is that the analysis is based upon local-currency indices and not on USD indices. This is done in order to control possible outliers and distortive factors, such as rapid depreciation of the currency or persistent appre-

ciation both of which distort the relative yields of stock exchanges.

III. Methodology

The question "if the economic series move together in the long run" has become an important issue over the last decade. If one can detect a cointegrating relation between the time series then this relation might lead to understand the nature of such a connection. Hence, exploring a cointegrating relationship between time series involves estimating cointegrating vectors.

Regarding the estimation of cointegrating vectors a number of research studies proposing different methods of releasing efficient estimators have been presented. Of those, one of the most popular is the procedure offered by Johansen (Enders,1995) which depends upon the lagged values on endogeneous variables. However, an alternative methodology on estimating the cointegrating vectors with efficient estimators has been stipulated (Stock and Watson, 1993).

The above-mentioned alternative methodology is easy to compute since it involves a Dynamic OLS with a number of leads and lags of the explanatory variable(s). The method can be used in I(1) type series and produces asymptotically efficient and Johansen equivalent estimators. Also, in cointegrating equations with more than two variables this method provides information as to which variables are cointegrated.

As an illustration of the Dynamic OLS method the two variable case might be considered;

Following the guidelines of the original model (Stock and Watson, 1993) let Y_t and X_t are time series which are I(1) and the triangular representation for these series is

$$(1) \qquad \Delta Y_t = u_t$$

$$(2) \qquad X_t = ß_0 + \theta Y_t + v_t$$

where u_t and v_t are both stationary stochastic processes and both are assumed to be Gaussian (in order to permit the development of the Gaussian MLE for θ). If those error terms are also independent of each other then we can write

$$(3) \qquad E(v_t \mid \Delta Y_t) = E(v_t \mid u_t) = d(L)\Delta Y_t$$

Hence, using (3), (2) might be denoted as,

$$(4) \qquad X_t = ß_0 + \theta Y_t + d(L)\,\Delta Y_t + z_t$$

where ΔY_t and z_t are independent and $z_t = v_t - E(v_t \mid u_t)$.

Supposing the data is generated this way the likelihood is realized on the pre-and post-values of ΔY_t. So, inference for (can be made by being conditional on Y_t. In this framework, it is stated (Stock and Watson, 1993)) that the series integrated with the order of one (i.e. I(1)) release efficient Dynamic OLS estimators which are equivalent to Johansen estimators and are distributed with χ 2 .

So, in this framework, dealing with series which are individually I(1) and which have a single cointegrating vector, one regresses one of the variables onto contemporaneous levels of the remaining variable, leads and lags of their first differences and a constant.

IV. Application of Dynamic OLS to the Stock Markets Data

In the light of the dynamic cointegration procedure pairs of stock market data will be analyzed as regards to cointegration relation. To this end, first the stationarity of individual series will be sought. Then, pairs of series which are individually I(1) will be tested if there exists a cointegrating relation between them. At the third stage, Dynamic OLS is applied in order to confirm the cointegration relation obtained in the former stage and to estimate the coefficient (θ). Finally, Engle-Granger methodology on the residuals of cointegrating relations of each Dynamic OLS regressions will be analyzed if the residual series are I(0), further confirming the existence of cointegration.

The general regression equation to be used is presented below;

$$(5) \qquad \text{Ln } Y_t = \beta_0 + \theta_1 \text{ Ln } X_t + \theta_2 \Delta \text{ Ln } X_t (-q) + \ldots + \theta_3 \Delta \text{ Ln } X_t (-1) + \ldots + \theta_5 \Delta \text{ Ln } X_t (+1) + \ldots + \theta_9 \Delta \text{ Ln } X_t(+T)$$

Here the lag interval is taken to be 1 - 4, an interval which is supposed to be long enough to cover all the transmission effects among the stock markets due to the dynamic nature of the relations. The lag interval is adjusted, for a few pairs of stock markets, if the cointegrating relation fades away before a lag length of 4. Hence, those lag intervals are taken while applying Dynamic OLS method and this number of lags as well as leads are guaranteed in the regressions.

At this point, the results of the above mentioned tests could be analyzed;

A. Stationarity of the Series:

Table-1 enlists the stationarity condition of the series. For this, ADF test is applied. Hence, the null hypothesis of "existence of unit root" is tested. The levels of the series give unit roots while the first differences of the logarithmic values of the series turn out to be stationary with a confidence level of 99% as given below.

TABLE IV.1 : Unit Root Tests (First Differences) (1)

Δ NYSE	-5.74 **
Δ CAN	-5.63 **
Δ UK	-5.64 **
Δ GERM	-5.45 **
Δ JAP	-4.84 **
Δ ARG	-4.34 **
Δ MEX	-4.07 **
Δ CHIL	-5.09 **
Δ GR	-5.18 **
Δ TURK	-4.92 **
Δ KORE	-5.00 **
Δ THAI	-5.35 **
Δ PHIL	-4.26 **

(1) * 5% Critical Value : -3.4807

** 1% Critical Value : -2.8833

So, first condition for the Dynamic OLS analysis is satisfied. At this point, the second step of spotting the existence of cointegrating vectors might be progressed onto.

B. Cointegration Tests:

Table-2 enlists the pairs of stock markets having at least 1 cointegrating relation. The series are tested against the null hypothesis of "there are no cointegrating vectors". As it is observed, Mexico and the Philippines turn out to be stock markets which reflect cointegration relations with many other stock exchanges.

As stated above, the cointegrating relation between the markets is sought within 4 lags due to the dynamic nature of stock exchanges. However, since the cointegrating relation fades away after 1 lag between Japan-Korea and Thailand-Philippines, after 2 lags between Korea-Philippines

and after 3 lags between Greece-Philippines the existence of cointegrating vector among those markets are analyzed within the mentioned lag intervals.

After searching for the existence of cointegrating vectors, the stage of application of the Dynamic OLS might be passed onto;

C. Dynamic OLS Results:

Table-3 provides the results confirming the Johansen test results. The θ_i coefficients are calculated and can be found in Table 3.

Referring to the calculated θ_i values, we can see that Japan reflects a negative cointegrating relation with most of the stock exchanges that cointegration is reported with.

After estimating the coefficients of the current level of the explanatory variables, we can turn our attention to a method of guaranteeing the cointegrating relations. Hence, we refer to the ADF tests of the residuals of each cointegrating equation.

D. Stationarity of Residuals:

In order to verify the results reflecting cointegration between the stock exchanges we glance at the residuals of these equations and their ADF tests. Since the cointegrating relations should prove themselves in their residuals with I(0) at level values, we expect our regressions to show such behavior.

Table-4 confirms the results of Table-2 and Table-3. However, we see that the residuals of the cointegration regressions, NYSE-PHIL, CAN-MEX, JAP-KORE, ARG-PHIL, ARG-KORE and MEX-KORE produce poor results while the residuals of the reverse regressions (PHIL-NYSE, MEX-CAN, KORE-JAP, PHIL-ARG, KORE-ARG and KORE-MEX) indicates I(0). Since the corresponding entries on the matrix contradict with each other and at least one of the symmetric relations reflect satisfactory results, we think that this irregularity stems from the sample size.

V. Interpretation of the Results

The results indicate that there exists a long-run tendency in a number of stock market indices to move together. Especially, Japan, Mexico and the Philippines produce results to worth mentioning. Stock exchanges of Mexico and the Philippines tend to cointegrate with most of the markets under consideration. On the other hand, the equations in which Japan takes

place produce negative θ_1 values with the exception of Korea. The negative coefficients might be accepted as an indication of portfolio diversification over the Japanese market and could be investigated further to conclude on that.

Among the developed country stock exchanges no indication of cointegration appears except the UK-NYSE relation. Though this does not mean public information is not transmitted (Cheung and Kwan, 1992) between those stock exchanges and contained in the equity prices nor does it make any implications about spillover effects or intraday pattern comparisons between overlapping stock exchanges and cross-listed stocks (Werner and Kleidon,1996). Rather, it indicates that a long-run systematic close relationship does not exist among the stock exchanges of the developed countries (Corhay et.al.,1993).

In the regional basis, the Latin stock exchanges show a long-run relation among themselves while a similar finding might be stated for the Far East Stock Exchanges. However, this is not true for Turkey and Greece. On the other hand, Mexico and the Philippines might be said to function as "pivotal" markets since they seem to be related with stock markets of different regions and of different groups.

As the means of communications and trading technology develops (Bennett and Kelleher,1988) the close links are detected among the stock markets. Increased trade, wider international operations and mobility of short term capital might be an explanation of long run relation in the stock exchange indices. By these findings in hand it is possible to conclude that price variability is transmitted continuously among certain stock exchanges while nothing precise can be stated about the continuous transmission of price volatility among the markets by merely glancing at the results. Also, based on the findings of this analysis, research on the arrival rate of public information (Chan et.al.,1996) and its effects on volatility, volume and bid-ask spread patterns among the cointegrated exchanges could be furthered.

TABLE IV.2 : Johansen Cointegration Test Results (1)

	NYSE	CAN	UK	GERM	AP	ARG	MEX	CHIL	GR	TURK	KORE	THAI	PHIL
NYSE		4.19	16.01*	10.16	9.08	5.50	26.87**	7.66	8.76	12.41	9.88	10.82	16.38*
CAN			3.15	9.56	6.55	3.59	21.90**	7.81	9.82	7.06	9.46	10.46	14.38
UK				10.16	7.94	4.83	32.75**	10.77	7.42	18.94*	10.14	10.06	16.80*
GERM					8.41	9.35	27.27**	9.79	12.42	12.70	10.95	11.07	17.66*
JAP (2)						32.55**	19.38*	17.82*	16.85*	8.05	16.43*	12.89	16.21*
ARG							23.96**	20.42**	11.75	3.83	20.22**	10.38	20.43**
MEX								30.02**	18.23*	20.11**	22.73**	18.04*	18.16*
CHIL									18.37*	10.73	13.51	12.78	17.58*
GR (2)										7.42	18.54*	12.37	15.97*
TURK											10.88	13.07	16.51*
KORE (2)												17.14*	18.83*
THAI (2)													20.13**
PHIL													

(1): ** indicates 1% level of significance and *indicates 5 % level of significance

(2) : Lag interval is 1-4 except Japan-Korea, Thailand-Philip.,Korea-Phil. and Greece-Phil.

TABLE IV.3 : Dynamic OLS Cointegration Test Results (1)

	NYSE	CAN	UK	GERM	AP	ARG	MEX	CHIL	GR	TURK	KORE	THAI	PHIL
NYSE			1.11 (0.02)***				0.24 (0.01)***						0.41 (0.02)***
CAN							0.11 (0.01)***						
UK	0.90 (0.02)***	0.22 (0.01)***	0.13 (0.004)***	0.38 (0.01)***									
GERM	0.20 (0.01)***												
JAP	-0.004 (0.003)	-0.08 (0.02)**	-0.10 (0.02)**	-0.09 (0.04)	0.22 (0.07)*	-0.15 (0.03)**							
ARG	7.96 (1.48)**	3.38 (0.1324)***	3.88 (0.13)***	9.07 (1.05)***	5.12 (0.34)***								
MEX	4.25 (0.18)***	6.29 (0.56)***	4.65 (0.18)***	4.14 (0.32)***	-2.22 (0.47)**	0.28 (0.01)**	1.10 (0.03)***	2.05 (0.09)***	0.64 (0.02)***	3.01 (0.3055)***	1.83 (0.06)***	1.68 (0.06)***	
CHIL	-2.91 (0.38)***	0.23 (0.01)***	0.89 (0.03)***	1.67 (0.09)***	1.55 (0.06)***								
GR	-0.8 (0.19)**	0.40 (0.03)***	0.49 (0.03)***	0.95 (0.15)**	0.53 (0.05)***								
TURK	7.20 (0.15)***	1.42 (0.07)***	2.46 (0.10)***										
KORE	0.37 (0.11)*	0.05 (0.004)***	0.12 (0.02)**	0.28 (0.04)***	0.35 (0.03)***								
THAI	0.47 (0.02)***	1.85 (0.13)***	0.82 (0.03)***										
PHIL	2.31 (0.10)***	2.57 (0.09)***	-1.01 (0.28)***	0.14 (0.009)***	0.52 (0.02)***	0.54 (0.03)***	0.99 (0.07)***	0.35 (0.01)***	1.09 (0.03)***				

(1): Null Hypothesis is "no cointegration exists"

*** indicates 1% level of significance, **indicates 5 % level of significance and * indicates 10 % level of significance.

TABLE IV.4 : Engle-Granger Residual Tests (1)

	NYSE	CAN	UK	GERM	JAP	ARG	MEX	CHIL	GR	TURK	KORE	THAI	PHIL
NYSE			-3.76***				-1.71*						-1.32
CAN							-0.28						
UK	-4.33***						-2.19**			-4.17***			-2.56**
GERM							-2.37**						
JAP						-4.26***	-2.44**	-2.53**	-1.97**		-1.52		-2.22**
ARG					-2.69***		-2.51**	-1.77*			-1.41		-1.43
MEX	-3.25***	-2.22**	-3.01***	-3.67***	3.71***	-3.17***		-4.03***	-2.57***	-2.69***	-1.54	-2.12**	-1.75*
CHIL					-3.01***	-1.73*	-3.61***		-1.90*				-1.99**
GR					-3.58***		-2.41**	-3.10***			-2.48***		-2.33**
TURK			-3.17***				-1.65*						-2.33**
KORE					-2.60***	-2.11***	-1.87*		-1.80*			-2.15**	
THAI							-2.08**				-1.85*		-1.85*
PHIL	-2.93***		-3.15***		-2.77***	-1.83*	-1.71*	-2.77***	-2.06**	-2.93***		-2.04**	

(1) :*** indicates 1% level of significance, **indicates 5 % level of significance and * indicates 10 % level of significance.

VI. Conclusion

In this paper Dynamic OLS method is applied in investigating the cointegration relations between a number of stock exchange indices. The results show that the developed market indices do not cointegrate except the UK and NYSE. Among the markets Japan shows interesting results since these results might be the indication of a global portfolio diversification. Also, Mexico and the Philippines stock exchanges act as pivotal markets since they seem to cointegrate with different country stock exchanges representing different regions and different stages of development.

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DEFINED CONTRIBUTION MODEL: DEFINITION, THEORY AND AN APPLICATION FOR TURKEY

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Abstract

Based on a numerical application that employs social and economic parameters of the Turkish economy, this study attempts to demonstrate that the current collapse in the Turkish social security system is not unavoidable. The present social security system in Turkey is based on the defined benefit model of pension provision. On the other hand, recent proposals for reform in the social security system are based on a multipillar system, where one of the alternatives is a defined contribution pension scheme. Utilizing a defined contribution model and Turkish parameters, this study reaches the following findings: first, based on Turkish parameters, the level of retirement pension is very sensitive to the retirement age. Second, the pension rates to be paid to retirees are very sensitive to the real rate of returns realized by pension fund investments. And finally, under a defined contribution model, where current parameters of the Turkish economy are used, reasonable levels of pension are found to be within reach.

I. Introduction

The International Labour Organization (ILO) has extended the concept of social risks to be covered by publicly organized social security systems by including medical care, sickness benefits, unemployment benefits, old-age benefits, employment injury benefits, family benefits, maternity benefits, disability benefits and survivors' benefits (ILO Convention No.102, 1952). In other words, all risks associated with work, health and retirement are included in the coverage of the expanded concept of social security. However, social security systems around the world are now suffering from serious economic, financial and social problems. Not only can social security systems not fully and equitably fulfill their expanded missions and intended functions, but they are also financially distressed because of adverse demographic developments as reflected in a worsening ra-

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tio of working to retired people. In particular, in many countries of Latin America and Central and Eastern Europe, state-run national social security systems cause a significant drain on the budget while reducing national savings, capital accumulation and growth of the economy. In addition, deteriorating social security conditions are claimed to lead to major labor market distortions (Holzmann, 1997). With inadequate coverage and insufficient funding of social security systems, a global search for an efficient system has started while proposed approaches and solutions cause heated social and political debates.

Turkey is among countries facing severe social security system problems. The debate in Turkey has received public attention only after the deficit in the state-run social security system started to account for about one third of the total public sector budget deficit, which runs at around 9 percent of GDP (Kenar et al., 1996 and TUSIAD, 1997). In the Turkish social security system, the ratio of actively working people to retired persons has also been declining. By generally accepted actuarial standards, the optimal magnitude of this ratio ranges from four to six. This ratio in Turkey has declined to almost two (TUSIAD, 1997). Furthermore, currently about half of the actual labor force is outside the formal social security system coverage (TUSIAD, 1997). Moreover, workers' contributions are relatively small, and financial returns of pension fund assets are low as the government has depleted social security funds through transfers to the general budget at unfavorable terms. The final outcome has been low retirement benefits and poor quality of social security system services. Despite increasing life expectancies observed in the Turkish society, amendments to early retirement provisions have reduced retirement age to an average of 50 years because of political missteps resulting from populism and shortsightedness (Kenar et al., 1996). According to the statistics published by the State Planning Organization (DPT), life expectancy of an average person retiring at age 50 is about 25 years (Temel Yapısal Değişim Projeleri Komite Raporları, DPT, 1995). That such a social security scheme with a relatively short worklife of approximately 30 years and a long retirement period of 25 years can operate in an actuarially feasible and financially sound manner is a remote possibility. That is the reason why recently almost all social security parameters including current retirement age, current levels of premium contribution, administration of accumulated funds, level of government contributions, level of retirement pay and even the organizational structure of the social security system have become the focal po-

int of current social, economic, and political debate in Turkey. Studies by ILO (1996) suggest that the expected level of deficit caused by the social security system at large will reach 7.1% of the GDP by 2005. In a nutshell, all things considered, the Turkish Security System is observed to provide below-par services and benefits. It also constitutes a major drain on the budget that runs large deficits. One should note that, unfortunately, Turkey is experiencing such problems despite favorable demographic factors such as a young population. This is in contrast to worldwide trends of an aging population as the primary reason for the social security crisis. As the population gets older in about 20 years, it is more likely that Turkey will face an additional wave of social security system crises. Therefore, if undertaken, the social security reform should address both the existing problems and the potential adverse future demographic developments.

Today, the social security reform has top prioty in the social and economic reform agendas around the world. However, the scope of the reform is limited as it tends to concentrate mostly on pension plan aspects of social security. Similarly, this study focuses only on old-age security issues without investigating other social risks to be covered by the social security system.

In this study, we start with a discussion of the current social and economic parameters of Turkey that are closely related to the social security system and then undertake a numerical analysis to argue that Turkey even under current economic conditions, does not have to suffer from a potential social security system collapse or unacceptable retirement pay or service quality. More specifically, this study raises the following questions: Is the social security system near bankruptcy because of unavoidable economic, social and demographic factors or is Turkey experiencing such a mounting problem because of erroneous political and social choices resulting from populism and short-term preferences? To address these issues, we first apply existing social security parameters of Turkey to a defined contribution pension fund system rather than the current defined benefit pension fund system and then extend it by establishing reasonable and plausible conditions to find out what kind of retirement benefits such a system could generate for the average Turkish pensioner. If a defined contribution system can produce satisfactory retirement benefits under Turkish parameters and plausible conditions, then our argument that the defined benefit system in Turkey has collapsed because of poor social and political choices made by the public decision makers will gain more appeal.

In this study, we do not intend to argue the supremacy of the defined contribution system over the current defined system. Each system has its merits and demerits. Moreover, as documented in Chili in 1980's, both the decision and the process to switch from one system to another prove hard and problematic from political and socio-economic perspectives (Diamond and Valdés-Prieto, 1994). As a matter of fact, it is probably easier to start a new system rather than implement a switch from an old system to a new one. However, if we show that there exists a viable alternative social security regime by pinpointing weaknesses of the current system, we can argue the importance of a defined contribution system in a multipillar model of social security system organization. Studies by the World Bank (Averting the Old Age Crises, 1994), TUSIAD (Turkish Industialists' and Businessmen's Association, 1997) indicate that a multipillar system is preferable to a system with only one alternative.

We first explain how a defined contribution system works and is modelled in the academic literature. Next, we investigate whether, given current Turkish parameters coupled with reasonable years of worklife and rates of contribution, a defined contribution can provide an adequate and sufficient level of retirement income. Finally, it is the purpose of this research to study the impact of years worked and real returns on accumulated social security funds on pension plans.

In the next two sections, some relevant definitions for formal pension systems and alternative systems are provided. A detailed discussion of the generally accepted model of the defined contribution system is presented. It is then followed by numerical applications of the model using Turkish parameters. Finally, a summary of the study and suggestions are offered in the last section.

II. Formal Arrangements for Old-Age Security

Today, in line with the objective of distributing social welfare to a wider segment of the population, governments have founded state-run formal old-age security organizations with the purpose of providing income support when individuals can not work due to old age or disability and suffer reductions in their living standards. Historically, formal old-age security systems have been formed either by the state or by employers. An organized and efficient old-age security system is expected to provide at least three basic functions: generate savings, redistribute income, and provide old age insurance (Averting Old Age Crisis,1994).

The first function of savings provision is to force individuals under the coverage of the pension system to save while they are productive so as to cover against reductions in future living standards. In other words, formal pension systems attempt to distribute individuals' income and expenditures more evenly over their lifetime by transferring their savings and expenditures from one phase of their life to another. During high-productivity and high-income periods of an individual's life, consumption is reduced to allow higher consumption during later stages of his/her lifetime when the productive capacity and earnings have been reduced.

The second and a very important function, especially of the state organized retirement pension systems, is generally to redistribute incomes among individuals under the coverage of the social security system. Incomes of high-life time earners are redistributed toward individuals with low-lifetime income, the main purpose being to prevent low-income individuals from falling below poverty level at some point later in their lives.

The third generally accepted function of formal pension systems is the insurance function. A prolonged recession, or an economic crisis, or wrong investments by the individual, or periods of high inflation can totally wipe out or dramatically erode the real savings of individuals. Furthermore, for people living beyond their average life expectations, the level of their savings might prove to be inadequate at a later stage in their lives. In the circumstances mentioned above, the formal retirement pension system serves an insurance function.

Formal arrangements for old-age security provision function under vastly varying structures. There are three basic types of formal organization: first, state-run plans; second, employer-organized occupational plans; and third, individual and personal savings plans. But if one considers the world as a whole, informal systems for income security, namely support among members of the extended family, are still the main method for the provision old-age security. Under these kinds of support systems, productive members of the family provide support to those members within the family who are no longer productive due to old age. The World Bank estimates that about 70 per cent of the elderly and about 60 per cent of the world's labor force are under coverage of the informal arrangements for income support (Averting the Old Age Crisis, 1994). However, changing social and economic conditions have resulted in changes in the structure and size of the families. Contrary to rural and agricultural production periods, in the era of urban and industrial production, children are no longer consi-

dered to be "an input to the production process, or an investment good, or a source of social security, but they are now considered to be only a source of love, or a pure consumption good". Hence, the family size becomes smaller and informal and interfamily support systems become weaker.

While informal systems of old-age support have been weakened, formal state-run systems of old-age support are also under financial stress. Either due to the structure of the systems or unfavorable demographic developments, formal state-run systems are also unable to provide the level and quality of services expected from them. Hence, various governments and international organizations have been attempting either to reform the existing old-age income security institutions, or to substitute formal systems of old-age support for informal arrangements. These efforts have led to the discussion of alternative ways of providing old-age income security, and advantages and disadvantages of various forms of social security systems. The section below takes a look at those alternative ways of old-age income security provision and attempts to shed some light on the technical terms and concepts arising during the discussion of alternatives.

III. Alternatives for Formal Pension Systems

In high and middle income industrialized countries, several alternative organizational forms for formal pension systems are being discussed.

Formal pension systems can be classified on basis of multiple criteria. According to one point of view, pension systems can be differentiated as to whether they are mandatory or voluntary. Voluntary pension plans could be in the form of personal savings plans or employer-sponsored occupational pension plans. These voluntary pension plans, if given tax incentives, grow rapidly and reduce a lot of the financial burden on governments. They are preferred as they reduce government contributions, but these plans do not facilitate any income redistribution. That is because they mostly include high-income individuals.

In mandatory plans, the state assumes the burden of management but the bureaucratic structure generally results in inefficiencies and high operational costs. These kinds of mandatory plans are first introduced for public workers, then for employees of large corporations, and finally for low-income workers and the self-employed.

According to another viewpoint, pension plans can be classified on basis of emphasis on savings enhancement or income redistribution. Based on the choice of priorities and the ensuing organizational structure, diffe-

rent types of risks arise. If the savings priority is chosen then future pension payment levels are uncertain. This is because the return on accumulated pension savings is dependent on the general economic climate and the type of investments chosen. These savings-oriented pension plans are called defined contribution systems and their future pension payment levels are a function of the investment of contributions made by savers. In these institutions, future payments are undetermined and uncertain. Therefore, pension savers under these types of savings and pension plans are subject to what is so-called the investment risk.

A different alternative, the defined benefit system focuses on income redistribution aspects of pension plans. In defined benefit plans, participants' entitlements for pension pay are predetermined on the basis of years worked, or possibly the average pay obtained in the last couple of years. These systems also carry some different risks such as disability risk, longevity risk induced by a long lifetime. In such cases, other participants are faced with the financial burden of the disabled or long living person. Furthermore, both of the competing alternatives are subject to the risk of erosion of savings due to inflation. Since non inflation indexed pensions suffer erosion of real value of savings, current alternatives include full or partial indexation to inflation, or wages. It should also be stressed that high political risks could arise under defined benefit systems because political motivations could increase pension pay with no economic rationale and the finances of the system could be dramatically worsened. Defined contribution systems do not carry these kinds of political risks, and prudent management of pension funds usually covers the inflation risk in a significant way.

From another perspective, pension systems could be based on a "Pay As You Go" (PAYG) system, where one generation finances the retirement of the preceding one. As an alternative to this system, one could have fully-funded or partially-funded systems. In a PAYG system, the current incomes cover the current expenses of the pension organization and there are no accumulated funds. In such funds, when the dependency ratio (ratio of pensioners to actively working people) increases, the ability of the fund to pay an adequate pension is reduced. In contrast, in a fully-funded system, as a principle, the current incomes of the system and the present value of past accumulations should cover all current payments. In such systems, if the passivity ratio (ratio of years in retirement to years at work) is small or if the real returns on fund investment are high, a higher

pension pay level becomes feasible. Defined contribution systems are, by definition, totally funded. However, defined benefit systems, even if they are initially formed with a fully-funded structure, over time lose the fully-funded nature due to longer periods of retirement, or due to economic and demographic changes. Uncertainties surrounding expected returns on accumulated funds, life expectancies and income levels lead to a gap in actual and expected pensions.

Finally, pension systems are also classified according to who assumes the management of the pension fund. The alternatives are either state-run pension systems or privately-managed pension funds. While some state-managed pension funds realize positive real rates of return, generally state-run pension funds frequently suffer from negative real rates of return as they invested on low-yield government securities. This results in lower than expected even negative real rates. This phenomenon can be named as "hidden inflation tax collection". On the other hand, privately-managed pension funds may also be subject to heavy losses. In particular, funds invested in capital market instruments decline in value sharply with unfavorable stock price movements.

Based on the above definitions, we should define the largest of the Turkish pension systems, Sosyal Sigortalar kurumu (SSK), serving over 26 million people, as an unfunded PAYG and a defined benefit system, emphasizing distribution aspects of the social security provision. As explained above, like most systems of its kind, SSK has huge deficits.

IV. An Alternative Pension Plan: Defined Contribution Model

In this section, we investigate the relationships among pension rate, contribution rate, length of working life and length of retirement life by using a mathematical model[1]. The presentation starts with the simplest possible set of assumptions and later introduces more realistic ones to explain the financial structure of the general defined contribution model. First simplifying assumption introduced to the model is that of a zero real interest rate. This assumption allows the comparison of flows of contribution payments and pension payments at different points in time without a need for compounding and discounting. Initially, it is also assumed that the growth rate of real wages is zero. In addition, pensions are assumed to be indexed to either prices or wages and thus making inflation immaterial in all calculations involved (alternatively, one may assume that the inflation

1 The pension model presented here is due to Vittas (1993).

rate is zero). Under these simplifying assumptions, the defined contribution pension plan collects contributions over the working life of the worker into a fund and then spreads the payment of a pension over the retirement life. One implicit assumption is that the cost of management of the pension plan is zero (alternatively, one may assume that the government covers the cost of management of the pension fund). The model can easily be modified to include management costs.

Under the above assumptions, if k stands for the contribution rate, and W represents the gross real wage, and p is the gross pension rate or the replacement rate (ratio of the pension to the gross real wage) and n is the length of the working life, and if m is the length of life in retirement, then we can write the relationship between the contribution rate and the gross pension rate as:

$$(1) \qquad k * W * n = p * W * m$$

Equation (1) states that if a worker contributes the sum of k.W for n years, then he/she will collect the sum of p.W for m years.
Solving equation (1) for p yields:

$$(2) \qquad p = k * \frac{n}{m}$$

Equation (2) shows that the greater the contribution rate and the greater the ratio of working life over retirement life, the greater will be the gross pension rate. Furthermore, if one considers that p is the ratio of the pension to the gross real wage before deducting contribution and if the symbol b is introduced to represent the net pension rate (ratio of the pension to the net wage) received after deducting contribution, one can obtain net pension rate as:

$$(3) \qquad b = \frac{p}{(1-k)}$$

As a numerical example, under the assumptions of zero growth rate of real wages and inflation rate, if k= 20%, n=25 and m=20, then p= 25% and b=31.25%. This means a pensioner will be able to obtain a pension payment equaling only to 31.25% of the real wages. However, when above assumptions are modified to k=20%, n=30, m=15 (longer working life, shorter retirement, constant lifetime), gross and net pension rates be-

come 40% and 50% respectively. In other words, under the second set of assumptions, pension payments reach a level of 50% of real wages. If we go back to the assumptions of n=25 and m=20 while increasing k to 30%, p and b become 30% and 53.57% respectively.

To make our analysis more realistic, let us relax initial simplifying assumptions one by one. First, the real interest rate is assumed to be positive, while maintaining initial assumptions of zero growth rate of real wages and inflation level. If the contribution payments are paid at the end of each year, contribution for the first year will collect interest for (n-1) years, those for the second year for (n-2) years and so on, while the contributions for the last year will collect no interest. At the time of retirement, the accumulated compounded value of the fund will be equal to the value of all discounted pension payments for m years.

If S denotes the accumulated value of a stream of payments for n years invested at a real interest rate of r%, and A stands for the discounted value of a stream of payments for m years discounted at a real rate of interest of r%, both computed at the time of the retirement, then the new objective function of the pension plan becomes:

$$k * W * S = p * W * A \qquad (4)$$

where

$$S = (1+r)^{(n-1)} + (1+r)^{(n-2)} + \ldots + (1+r) + 1 \qquad (5)$$

and

$$A = \frac{1}{(1+r)} + \frac{1}{(1+r)^2} + \ldots \frac{1}{(1+r)^m} + \qquad (6)$$

One can view S as the future value interest factor on an n-period annuity and A can be seen as the present value factor on a different m-period annuity. It should be noted the same real interest rate r is used and computations are done at the point of retirement.

Under above definitions, equation (2) becomes:

$$p = k * \frac{S}{A} \qquad (7)$$

It should be observed that if r=0%, S and A equal n and m respectively. Similarly, for positive values of interest rate, S is greater than n while A is smaller than m. This is why, given the contribution rate k, positive

real interest rates generate a pension rate p larger than the pension rate level under a zero per cent real interest rate assumption.

When one allows for a positive rate of growth of real wages (g) in addition to a positive real interest rate (r), the algebra of the defined contribution model becomes more complicated. Let us first assume equality of r and g. While the essence of analysis remains, the same results do change. When real wages are indexed to inflation, a positive growth rate of real wages can still be necessitated by such factors as increases in productivity, seniority and responsibilities. Under this set of assumptions, both the contributions and the real wages will earn interest.

Under the assumption of r=g, equation (7) is transformed to (8) as:

$$(8) \qquad k * W * F = p * W * (1+g)^{(n-1)} * A$$

In this equation, F represents a cash flow that grows at rate g, earning interest at rate r. On the other hand, A is the same as in equation (6).

$$(9) \qquad F=(1+r)^{(n-1)} + (1+g)*(1+r)^{(n-2)} + (1+g)^2 * (1+r)^{(n-3)} + \\ +...+ (1+g)^{(n-2)} * (1+r)+(1+g)^{(n-1)}$$

If the assumption of r=g is superimposed on the above set of equations, F becomes:

$$(10) \qquad F=n * (1+g)^{(n-1)}$$

and equation (8) is simplified as below:

$$(11) \qquad k * W * n * (1+g)^{(n-1)} = p * W * (1+g)^{(n-1)} * A$$

By simplifying equation (11) under the assumption of r=g, the pension rate becomes:

$$(12) \qquad p = k * \frac{n}{A}$$

To make our analysis more realistic, if both r and g are assumed to be positive but not equal while indexation of real wages to inflation still continues, F changes to (13) as:

$$(13) \qquad F = \frac{(1+r)^n - (1-g)^n}{(r - g)}$$

Basic equations transform to :

$$(14) \qquad k * W * F = p * W * G * A$$

where $G = (1+g)^{(n-1)}$, solving equation (14) for p yields:

$$(15) \qquad p = k * \frac{F}{G * A}$$

As shown in Vittas (1993), similar analyses can also be conducted for the defined benefit model for pension plans. Furthermore, the modelling procedure could be modified to facilitate the indexation of pension payments to wages rather than to inflation. The model could easily be modified to include management costs. In numerical applications, one should note that equation (13) becomes singular when r=g. In such a case, equations (8), (9) and (10) should be used to solve for p.

V. An Application of the Defined Contribution Model for Turkey

In this section, we numerically study the relationships between real returns on accumulated pension funds and levels of pension payments for various lengths of working life and retirement periods and rates of contribution. It is not our intention to lend support to any specific social security model, but to argue that far better pension payments can be offered to pensioners if the accumulated pension funds are invested say, at around 4 percent in real terms (relatively modest levels by Turkish standards (Yıldırım, 1996).

When one studies the numerical applications, it immediately becomes clear that when the real interest rate exceeds the growth rate of real wages, for example, at such a modest real interest rate of four per cent and real wage growth rate of two per cent, gross pension rate easily reaches 50%. When real rates of return on accumulated pension funds are above the real growth rates of wages by at least 5-6 per cent, pension rates jump over 100 per cent of average gross income at working life. Under such extreme assumptions, average pension income is even greater than the average income earned during working period.

The first simulation is run by feeding actual parameters of Turkish social security into the model (TUSIAD, 1997 and DPT, 1995). We take an

18% contribution rate (k), 30 years of working life (n) and 25 years of retirement life (m) for an average worker who joins the workforce at age 20. Table (1) lists values of gross pension rates (p) for a combination of real interest rate (r) and growth rate of real wages (g) under above underlying assumptions. For example, when g=3 and r=6, gross pension rate of 66 per cent is obtained.

Using the same (n), (m), (k) while keeping (g) constant at 3 per cent but increasing (r) to 7 per cent, the pension rate moves up to 85 per cent of real wages. The implications of this conclusion are striking. In a country like Turkey where, in the last ten years, real returns on money market instruments, stock market investments, and TL fixed-income investments have easily and frequently exceeded 20 per cent in real terms (Yıldırım, 1996), if pension fund accumulations of working people were invested at competitive market rates, it was possible to obtain average pension rates exceeding even average real wages earned during the working years. This clearly demonstrates how sensitive the pension payments are to the returns on pension fund accumulations. This also indicates the unneccessary burden imposed on working people by the state-run retirement schemes in Turkey through inefficient investment policies.

Table (2) presents gross pension rates calculated using contribution rate (k) of 10 per cent, which is observed in the successful Chilean experience of the defined contribution pension scheme (AFP, The Chilean Private Pension System, 1996). We also increase working life (n) to 35 years, and reduce (m) to the actual life expectancy at age 55 in Turkey of 21 years (DPT, 1995). Even in an environment where contribution rates are almost halved, as long as the real interest rate exceeds the real growth rate of wages by over 2-3 per cent reasonable pension payments can still be obtained. For example, when r and g are set to be 6 and 3 per cent respectively, the pension rate (p) is found to be 50.5 per cent.

We undertake a different experiment in Table (3). Here, he contribution rate (k) is moved up to 20 per cent while n is kept at 35 years and m at 21 years. This achieves a dramatic improvement over pension payments. With g=3% and r=6%, the longer working life moves the pension rate (p) from the previous 50.5 per cent up to 101.1 per cent. This demonstrates the significance of the relationship between longer working life and higher pension levels.

In Tables (4) and (5), we analyze the effects of the proposed retirement age of 60 by ILO (1996) on pension rates. Reducing k again to 10 per cent

and setting n= 40 and m=17 (retirement at 60), for example, when g=3% and r=6%, the pension rate becomes 70.6 per cent of real wages.

In Table (5), we set k again at 20 per cent while keeping all other assumptions used for Table (4). With n=40 and m=17 (retirement at 60), the pension rate increases to 141.1 per cent at g=3% and r=6%. In other words, retirement at age 60 under reasonable parameters can provide workers with an average pension significantly exceeding their average income from work for an average of 17 years.

VI. Conclusion and Suggestions

Summarized below are some of the relevant results of the study:

1. The numerical analysis suggests that pension systems are extremely sensitive to the length of working life and length of life in retirement. Especially, as has been the case in Turkey, shortening the length of working life when life expectations are actually increasing can dramatically deteriorate the ability of the system to provide an adequate level of pensions.

2. The numerical analysis also shows that the pension rate is also very sensitive to real returns realized on the pension fund. Regardless of whether the fund is managed publicly or privately, as long as the contributions of the workers obtain an adequate real rate of return in line with those obtained by money and capital market investors, pensioners would not suffer from an income insufficiency or falling living standards during retirement. Our findings also suggest that, even at the current average contribution of 18 per cent, pension payments can be improved as long as the real returns are over the real growth rate of wages by 3-5 per cent. Based on our results, several suggestions can be made. First, shortsightedness in the past and resorting to social security funds at below market rates by politicians should be immediately abandoned. One should bear in mind that early retirement provisions introduced in this decade have been very costly to the financial health of the pension system. There is no doubt that early retirement provisions coupled with increased life expectancy have distorted the financial structure of the social security system, while deteriorating coverage of social security risks. Second, numerical applications suggest that lengthening of the working life to reasonable levels and lifting of early retirement provisions would have a positive impact on pension rates. Furthermore, the study indicates, even at the current parameters of the social security system, as long as accumulations of workers earn competitive market rates of return, pension rates may improve. Our analysis also shows the power of the defined contribution system in im-

proving pension rates. This finding is relevant because the defined contribution system is recommended to be adopted as part of a multipillar system by the World Bank (1995) and TUSIAD (1997). Furthermore, this study indicates that some advantages can be obtained in the provision of adequate retirement pay, if the defined contribution pension system is adopted as part of a multipillar system.

Table 1: Gross Pension Rates

k= 18% n= 30 m= 25	g: Growth rate of real wages					
r: Real Interest Rate	0%	1%	2%	3%	4%	5%
0%	21.6	18.8	16.4	14.5	12.9	11.6
1%	28.4	24.5	21.3	18.7	16.6	14.8
2%	37.4	32.0	27.7	24.1	21.2	18.7
3%	49.2	41.8	35.9	31.0	27.1	23.8
4%	64.6	54.6	46.5	39.9	34.6	30.2
5%	84.9	71.2	60.2	51.3	44.2	38.3
6%	111.3	92.8	77.9	66.0	56.4	48.6
7%	145.9	120.8	100.9	85.0	72.1	61.7
8%	191.0	157.3	130.6	109.3	92.2	78.4
9%	249.8	204.6	168.9	140.5	117.8	99.6
10%	326.2	265.8	218.3	180.6	150.6	126.5

Table 2: Gross Pension Rates

k= 10% n= 35 m= 21	g: Growth rate of real wages					
r: Real Interest Rate	0%	1%	2%	3%	4%	5%
0%	16.7	14.1	12.1	10.5	9.2	8.2
1%	22.1	18.6	15.8	13.6	11.8	10.3
2%	29.4	24.4	20.6	17.5	15.1	13.1
3%	39.2	32.3	26.9	22.7	19.4	16.7
4%	52.5	42.9	35.4	29.5	24.9	21.3
5%	70.4	57.0	46.6	38.6	32.3	27.3
6%	94.7	76.0	61.6	50.5	41.9	35.1
7%	127.6	101.6	81.7	66.4	54.6	45.3
8%	172.0	35.9	08.5	87.5	71.3	58.7
9%	232.1	182.2	144.4	115.6	93.4	76.3
10%	313.4	244.4	192.4	152.9	122.7	99.4

Finally, a warning is due. If such a defined benefit system is not incorporated into a state-run multipillar social security system, high-income groups are more likely to shift their funds into private pension funds and low-income workers will have to settle with inadequate levels of retirement pays offered by the state-run security system.

Table 3 : Gross Pension Rates

k= 20% n= 35 m= 21

g: Growth rate of real wages

r: Real Interest Rate	0%	1%	2%	3%	4%	5%
0%	33.3	28.3	24.3	21.1	18.5	16.4
1%	44.2	37.1	31.6	27.1	23.6	20.7
2%	58.8	48.9	41.1	35.0	30.2	26.2
3%	78.4	64.6	53.9	45.4	38.7	33.4
4%	105.0	85.7	70.8	59.1	49.9	42.6
5%	140.9	114.0	93.2	77.1	64.5	54.6
6%	189.4	152.0	123.3	101.1	83.8	70.2
7%	255.2	203.1	163.4	132.8	109.1	90.7
8%	344.1	271.9	217.0	175.0	142.6	117.4
9%	464.3	364.4	288.8	231.1	186.8	152.6
10%	626.7	488.9	384.8	305.8	245.4	198.8

Table 4: Gross Pension Rates

k= 10% n= 40 m= 17

g: Growth rate of real wages

r: Real Interest Rate	0%	1%	2%	3%	4%	5%
0%	23.5	19.5	16.4	14.0	12.1	10.6
1%	31.4	25.7	21.3	18.0	15.4	13.3
2%	42.3	34.1	28.0	23.3	19.7	16.8
3%	57.3	45.7	37.0	30.4	25.3	21.4
4%	78.1	61.6	49.2	39.9	32.9	27.4
5%	107.1	83.5	66.0	52.9	43.0	35.5
6%	147.7	113.9	89.0	70.6	56.7	46.2
7%	204.5	156.2	120.8	94.7	75.2	60.6
8%	284.0	215.0	164.7	127.8	100.5	80.0
9%	395.5	297.0	225.6	173.4	134.9	106.4
10%	551.8	411.3	309.9	236.2	182.1	142.1

Table 5 : Gross Pension Rates

k= 20% n= 40 m= 17

g: Growth rate of real wages

r: Real Interest Rate	0%	1%	2%	3%	4%	5%
0%	47.1	39.0	32.8	28.0	24.2	21.2
1%	62.8	51.4	42.7	36.0	30.7	26.6
2%	84.5	68.3	56.0	46.6	39.3	33.6
3%	114.5	91.4	74.0	60.8	50.6	42.8
4%	156.2	123.1	98.5	79.9	65.8	54.9
5%	214.3	167.0	132.0	105.8	86.0	71.0
6%	295.4	227.8	178.1	141.1	113.4	92.4
7%	409.0	312.3	241.6	189.4	150.5	121.2
8%	568.0	430.0	329.5	255.6	200.9	160.1
9%	791.0	593.9	451.1	346.8	269.9	212.7
10%	1103.5	822.6	619.8	472.3	364.2	284.3

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PENSION REFORM, THE STOCK MARKET, CAPITAL FORMATION AND ECONOMIC GROWTH: A CRITICAL COMMENTARY ON THE WORLD BANK'S PROPOSALS

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Abstract

Proposing far-reaching reforms to pension systems, the World Bank has recently suggested that the existing pay-as-you-go systems in many rich as well as poor countries should be replaced by fully funded, mandatory, preferably private pensions, as the main pillars of the new system. It argues that these reforms will not only benefit pensioners but also enhance savings, and promote capital formation and economic development. This paper provides a critical examination of the Bank's theses and concludes that it has adopted a one-sided view of the relationships between the key critical variables. The proposed reform may therefore neither protect the old nor achieve faster economic growth.

I. Introduction

The World Bank, in an important and influential document (World Bank, 1994; hereafter referred to as the report), has proposed far-reaching reforms to the pension systems in both developing and developed economies. Essentially, the Bank argues that the current pay-as-you-go pension schemes, which exist in many rich as well as poor countries, are seriously flawed and no longer serve the objectives they were intended to promote. The Bank proposes instead fully funded, mandatory, preferably private pensions as the main pillar of its new system. It suggests that these proposed reforms will not only be beneficial to retirees and pensioners but at the same time enhance savings and promote capital formation and economic development.

The Bank's critique of the extant pension systems as well as its propo-

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sed new pension regime have been challenged by a number of writers. These contributions have, however, concentrated on the social policy implications of the Bank's analysis and proposals. The present paper will briefly review the debate on these issues, but its main subject will be a critical examination of the Banks theses concerning the relationship between funded private pensions, the development and expansion of the capital markets, savings, capital formation and economic growth. Although the Bank's recommendations are universal in their scope and cover both rich and poor countries, this paper will concentrate on the latter, where these particular issues are more salient.

It is, however, important to note at the outset that there is a significant potential linkage between the proposed pension reforms for the two groups of countries. Recommendations similar to those of the World Bank have been made in the recent period for advanced countries by the Swedish Economic Commission chaired by Assar Lindbeck (Lindbeck et al., 1994) and in a report by Mortensen (1993). These documents also recommend that the state pensions in European countries be largely replaced by privately funded pension schemes. The broader context for the European initiatives is the conventional wisdom among orthodox economists that the Welfare State is responsible for the slow economic growth in Europe and that it is necessary to reduce state spending on social security in order to revive growth.[1]

Reisen (1994) has gone further and linked what he regards to be the impending crisis of public pension systems in Europe with development of stock markets in the Third World. He notes that "to safeguard public finances, jobs, and performance, expert reports...recommend unanimously the same funded pension schemes have to be phased in-now!" In an ingenious proposal, Reisen suggests that in order to maximize returns on these privately funded pensions in rich countries, their assets should be invested on stock markets in developing countries. The shift of pension money from the ageing to the emerging markets, he argues, is, to use the eco-

[1] Feldstein (1995) is apocalyptic in his reflections on these issues for the United States. He ascribes the decline in the US net national saving rate from 8 per cent in the 1970s to only 4.5 per cent in the 1980s in part to that country's system of social security retirement benefits. He goes on to say that this decline in savings "may not only create lower real incomes and slower growth but may weaken capitalism itself. In the United States, a decade of slow growth has increased protectionist tendencies in international trade and led to a new interest in industrial policies that expand the role of government in guiding the direction of technology and of private investment. In these ways, the government policies that discourage saving might make the Schumpeterian vision of shift from private capitalism to a government-dominated economy more likely" (pp.399-400).

nomist's jargon, Pareto optimal: it will benefit both the developing countries (through the growth of their stock markets as well as a greater inflow of foreign capital) and retirees in the "greying" economies (through higher rates of return).

The present paper is organized as follows. The next section will outline the Bank's analysis of the pay-as-you-go pension schemes as well as its proposed new regime. The social policy critique of these proposals will be reviewed in the section after that. The Bank's propositions with respect to funded private pensions, the development of the capital markets and economic growth will be closely analysed in the following five sections. It will be argued here that the Bank's theses in this area are, at best, of doubtful validity. The proposed reforms may not only be not conducive to economic growth but carry a serious risk of undermining it. Consequently, the reforms may not even meet the primary objective of providing adequate pensions for the aged population.

II. The World Bank's Analysis and Proposals on Pension Reform

The World Bank's report has two central themes. The first is the stringent criticism of the existing pension systems in both developed and developing countries, particularly the latter. The second is the advocacy of the Bank's own preferred system. The criteria by which the report assesses alternative schemes are explicitly set out:

> ...that old age security programs should be both an instrument of growth and a social safety net (p.9).

Specifically, it is suggested that these programmes should help old people by *(a)* facilitating savings during their active working years; *(b)* redistributing additional income to those who are lifetime-poor but "avoiding perverse inter-generational and unintended intra-generational redistributions"; and *(c)* providing insurance against the many risks to retirees' pensions. In addition, it is suggested that a useful pension scheme for old people should also help the economy as a whole by *(a)* minimizing distortions in the labour and capital markets and "other hidden impediments" to economic growth; (b) being sustainable in the long term in the changing economic and demographic conditions; and *(c)* actively promoting overall economic expansion.

The existing pay-as-you-go systems are condemned on both efficiency and distributional grounds. It is argued that these systems often lead to po-

litical promises of generous post-retirement benefits to workers, leading to high contributions or, as perceived by the workers, high taxes. This in turn leads to tax evasion and switches to informal activities, various other labour market distortions resulting in lower overall employment, reduced output and lower labour supply. In addition, these pension schemes are also thought to reduce economic growth from what it otherwise could be by failing to increase national savings or even reducing them. In short, the Bank claims that the existing social security systems have:

> too often produced costly labour and capital market distortions and perverse redistributions to high income groups[2] while failing to provide security to the old — outcomes that are neither efficient nor equitable nor sustainable (p.14).

The pension programme recommended by the World Bank's report has a three-tiered structure. At its core is a defined contribution, fully funded, mandatory private pension plan for each worker. This is supplemented by a public pension scheme of modest size with the "limited object" of alleviating old age poverty and co-insuring against a multitude of risks. The third tier of this system is a voluntary occupational or personal savings plan for those who want more income or insurance in their old age. In this scheme the savings function is performed by the first tier, the redistribution by the second, and the insurance jointly by all three ("since broad diversification is the best way to insure against a very uncertain world").

While the report recognizes that, in principle, the mandatory funded core of the scheme could be either publicly or privately managed, private management is preferred on the grounds of the much higher rates of return achieved by private schemes than the publicly managed "providend funds" which many developing countries have. However, the report goes on to observe:

> Higher returns to contributors aside, mandatory, privately managed funded schemes offer economy-wide advantages. They can be part of a national policy to develop new financial institutions and deepen capital markets by mobilizing long-term saving and allocating it to the most productive uses, including uses in the private sector. For these reasons, the report strongly recommends that the funded pillar be privately managed (pp.17-18).

[2] This is in part because the rich receive larger lifetime benefits than the poor because they live longer.

In general, the report favours privately managed portable savings plans to occupational pension plans established by employers, on the grounds that the latter lead to labour market distortions and can have adverse distributional consequences. The Chilean pension reform initiated in the early 1980s, with its privately managed mandatory personal saving scheme, is commended by the report.[3] It is essentially put forward as a model for other countries to follow.

III. The Social Policy Critique of the World Bank's Pension Reform Plan

The reform proposals outlined above, as well as similar ones put forward in the advanced countries, have, as noted earlier, attracted a considerable critical literature.[4] These writings have questioned the kind of analysis and conclusions embodied in the report on a number of grounds. Very briefly, these criticisms may be summarized as follows:

- Many of the shortcomings of the public schemes analysed by the Bank are equally, if not with greater force, applicable to private schemes. Moreover, it is suggested that the positive merits of the pay-as-you-go pension schemes in many countries, particularly industrial countries (e.g. reducing old age poverty, administrative efficiency) have been ignored by the report.
- In a detailed analysis of the Chilean pension scheme (the Bank's model), Gillion and Bonilla (1992) bring out the risks involved for the individual pensioner in such a scheme. These risks include the risk of personal misfortune (e.g. sickness, invalidity) and the risks associated with volatility in the rates of return on investment funds.[5] In the opinion of the two authors, the scheme falls short of the standards imposed by the ILO Conventions on Social Security (Minimum Standards) and that on Invalidity, Old Age and Survivor's Benefits.
- It is shown that the Chilean scheme has very high transitional costs, particularly for the government. These have been estimated to amount to almost 5 per cent of GDP in recent years, which most other poor countries could ill afford (Uthoff, 1993).

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[3] There is a large and growing literature on the Chilean model. For an excellent exposition, see Gillion and Bonilla (1992). See also Uthoff (1993), Ghillarducci (1995), Vittas and Iglesias (1992).

[4] See Atkinson (1995), Beattie (1994), Wolfe (1994), Ghillarducci (1995), Gillion and Bonilla (1992), Beattie and McGillivray (1995).

[5] Such financial market fluctuations, which can be quite enormous, will greatly affect the retirees' pensions under this scheme. This point is taken up further in the following sections.

- Although the Chilean scheme has 86 per cent of the labour force affiliated to it, the compliance rate has been poor. Those actually contributing to the scheme have never been more than 55 per cent of the labour force.
- The Chilean scheme has adverse distributional effects. Not only is the compliance rate of the rich much higher than that of low-paid workers, but the rich also earn higher rates of return on their investment funds.[6]
- The scheme has high administrative costs compared with publicly managed provident fund schemes. These costs in the Chilean case amounted in 1990 to 15 per cent of the contributions and derive in large measure from the fund managers' expenditures on advertising and sales. By contrast, the corresponding costs in the case of Singapore's state-managed provident fund were about half of 1 per cent (0.53 per cent) of the contributions (Vittas,1993).
- The scheme is not only inequitable within social groups of the same generation but, unlike the pay-as-you-go systems, it does not provide for any intergenerational solidarity.

Beattie (1994) rightly notes that in view of the risks to pensioners and other shortcomings outlined above, "it would seem inconceivable that the Bank's pension strategy could be justified on social policy grounds". Thus, if there is a rationale for this strategy, it must lie in the additional claim that the proposed scheme will enhance economic growth. The main channel through which this is to be achieved is increased long-term savings and the expansion and deepening of the financial markets. As the report notes:

> The mandatory saving pillar can be important for increasing long-term saving, accelerating capital market development, boosting investment in productive capital, and monitoring corporate performance. For countries where the current rates of long-term saving and capital accumulation are below optimal levels, such changes have the potential to enhance economic growth. But the allocation and productivity of this capital depend on whether the funds are publicly or privately managed (p.208).

The following sections will closely analyse the supposed links between the mandatory pension scheme, long-term national savings, the development of the capital market, and long-term economic growth.

6 Vittas and Iglesias (1992).

IV. Pension Funds and Capital Market Development

Essentially, the chain of causation implicit in the Bank's argument of the relationship between the variables mentioned above may be put as follows. The promotion of private pension funds leads to the expansion and deepening of equities and bond markets. These developments in turn raise economic growth through the following channels: *(a)* by increasing aggregate savings and investments; and *(b)* by increasing the productivity of these investments. The reasons for *(a)* and *(b)* will be explained in the next section . In the meantime we consider here the prior question: whether or not private pension funds lead to the development of the stock markets in poor countries.

As Table 1 shows, there has been a quite enormous expansion of developing country stock markets around the globe in the past decade or so. Between 1982 and 1992, the total combined capitalization of companies quoted on the emerging markets included in the *Economist*'s list rose from less than a hundred billion to nearly a trillion US dollars.[7] The corresponding growth in the combined capitalization of industrial countries' markets was a little more than threefold — from 3 trillion to 10 trillion US dollars. A number of leading individual emerging markets (e.g. Mexico, Republic of Korea, Thailand) recorded over this period a more than twentyfold increase in total market capitalization of companies quoted on the stock exchanges. By the early 1990s, the latter figure for many emerging markets, whether considered in absolute terms or as a proportion of GDP, was greater than that for the average medium-sized advanced country markets in Europe (e.g. Sweden, Denmark and Finland).

In the context of the present discussion, it will be appreciated that this huge development of stock markets has occurred in most countries without private pension schemes of the kind advocated by the Bank. Indeed, as Vittas (1992) observes, "it is fair to say that few, if any emerging equity markets owe their impressive performance in the 1980s to the presence or impact of contractual savings institutions"[8]

Nevertheless, it may be useful to reflect here on the specific case of Chile, the Bank's exemplar country. The report credits the pension reform

7 For further information, see Feldman and Kumar (1994). It may be noted that the Economist's list of emerging markets includes both Hong Kong and Singapore. However, the International Finance Corporation in its classification regards both these countries as developed markets.

8 For a detailed discussion of the reasons for the vast expansion of stock markets in developing countries during the past decade or so, see Singh (1995a).

Table 1. Market Capitalization of Traded Equities

	1983		1992	
	US $ (bill.)	% of GDP	US $ (bill.)	% of GDP
Latin America				
Argentina	1.4	1.3	18.6	8.2
Barbados	na	na	0.3	16.4
Brazil	15.1	7.4	45.3	11.7
Chile	2.6	13.2	29.6	78.1
Costa Rica	0.1	3.8	0.5	7.7
Colombia	0.9	3.1	5.7	11.6
Jamaica	0.1	2.8	3.2	100.7
Mexico	3.0	2.0	139.1	43.0
Peru	0.5	2.6	2.6	5.6
Trinidad and Tobago	1.0	12.8	0.5	9.2
Venezuela	2.8	3.5	7.6	12.4
Uruguay	-	-	0.4	3.5
East Asia				
China	na	na	18.3	4.2
Hong Kong	17.1	70.8	172.1	177.0
Korea, Rep. of	4.4	5.3	107.4	36.2
Philippines	1.4	4.3	13.8	26.2
Singapore	15.5	89.2	48.8	106.0
Taiwan, China	7.6	14.5	101.1	48.9
South Asia				
Bangladesh	0.05	0.4	0.3	1.3
India	7.2	3.5	65.1	26.7
Indonesia	0.1	0.1	12.0	9.3
Malaysia	22.8	76.1	94.0	163.3
Pakistan	1.1	3.7	8.0	15.8
Sri Lanka	na	na	1.4	14.5
Thailand	1.5	3.8	58.3	55.4
Europe/Middle East/Africa				
Côte d'Ivoire	0.3	4.4	0.3	na
Egypt	1.1	3.0	2.6	6.2
Greece	1.0	2.9	9.5	12.0
Iran Islamic Rep. of	na	na	1.2	0.1
Jordan	2.7	56.7	3.4	73.9
Kenya	na	na	0.6	7.5
Mauritius	na	na	0.4	13.2
Morocco	0.3	2.1	1.9	6.6
Nigeria	3.0	3.7	1.2	4.5
Portugal	0.1	0.5	9.2	10.9
Tunisia	na	na	0.05	0.3
Turkey	1.0	2.0	9.9	8.9
Zimbabwe	0.3	4.8	0.6	8.2
Largest Industrialized Countries				
Canada	141.0	42.8	243.0	42.7
France	38.1	7.2	350.9	26.5
Germany	82.6	12.6	348.1	17.9
Italy	21.0	5.0	115.3	9.4
Japan	565.2	47.6	2 399	65.4
UK	225.4	48.9	838.6	79.8
US	1 898.1	55.7	4 757.9	78.8

Source:Based on International Finance Corporation Emerging Markets Data Bank and International Financial Statistics
Data are for end of period
- = capitalization less than US$10 million
na = data not available

with the development, expansion and deepening of capital markets in that country. Table 2 and 3 provide information on the growth of pension funds and the stock market in Chile since 1981. Table 2 shows that cumulated pension funds rose from less than 1 per cent of GDP in 1981 to nearly 40 per cent in 1992. Under the Chilean pension fund regime, the funds, Administradoras de Fondos de Pensiones (AFPs), were allowed to invest in the stock market only after 1985. Consequently, as the table shows, there has been a marked change since then in the funds' portfolio composition — substitution of equity shares for bonds and bank deposits.

Table 3 indicates that there has been a big increase in the volume and value of stock market operations and pension fund equity investments in Chile since the mid-1980s. However, as Uthoff (1993) notes, "due to the fact that this period has been accompanied by high and stable GDP growth rates, together with important incentives for arbitrage of international interest rates causing large capital inflows and currency appreciation, we are unable to draw any direct causal effect between pension funds and stock market developments".

In support of Uthoff's conclusion, it may also be observed that the expansion of equity markets in Chile is not out of line with that of other fast expanding equity markets in developing countries. It is equally significant that on some other principal indicators of stock market development, Chile does not do as well as a number of other emerging markets. Table 4 shows, for example, that the number of listed companies actually declined in Chile over the period 1980 to 1992 (from 265 to 245 respectively), while in India the number rose from below 1,000 to nearly 3.000.

Table 2. Portfolio Composition of Pension Funds in Chile

Years	Central and treasury bonds (%)	Bank deposit and bonds (%)	Mortgage securities (%)	Firm bonds and debentures	Common Stock (%)	Funds in millions of US$ equivalent	Funds as percentage of GDP
1981	28	62	9	1	0	219	0.9
1983	44	3	51	2	0	1 223	6.4
1985	43	23	36	2	0	2 228	10.9
1987	42	28	21	3	6	3 570	15.5
1988	35	30	21	6	8	4 370	16.5
1989	42	21	18	9	10	5 388	19.7
1990	44	17	16	11	11	7 316	26.5
1991	38	12	13	13	24	10 078	34.4
1992 (June)	37	10	13	12	28	11 922	38.1
2000[a]							49-54
2010[a]							77-87
2020[a]							88-109

Source: Uthoff (1993) [a] Projection

Table 3. Stock Market and Pension Fund Portfolio in Chile

	Common stock		Pension funds	
	Price Index	Volume of traded Index	Market value (million of US$)	Common stock (million of US$)
1981	105	592	5.000	-
1983	70	369	2.783	-
1985	100	100	2.919	-
1987	313	908	6.852	223
1988	425	1.094	8 438	354
1989	581	1.372	11.375	545
1990	750	1.155	14.564	806
1991	1.682	2.651	27.706	2.406
1992 (June)	2.122	3.177	34.444	3.347

Source: Montt (1992) and Uthoff (1993)

Table 4. Listed Companies in Emerging Markets, 1981-1992

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Korea, Rep. of	343	334	328	336	342	355	389	502	626	669	686	688
Pakistan	311	326	327	347	362	361	379	404	440	487	542	628
Thailand	80	81	88	96	100	98	125	141	175	214	276	305
Jordan	72	86	95	103	104	103	101	106	106	105	101	103
Mexica	229	206	163	160	157	155	190	203	203	199	209	195
India	1031	1106	1151	1295	1529	1912	2095	2240	2407	2435	2556	2781
Turkey	na	na	na	373	na	40	50	50	50	110	134	145
Malaysia	187	194	204	217	222	223	232	238	251	282	321	366
Zimbabwe	62	62	60	56	55	53	53	53	54	57	60	62
Chile	242	212	214	208	228	231	209	205	213	215	221	245
Brazil	477	493	505	522	541	592	590	589	592	581	570	565

na = not available

Source: International Finance Corporation, Emerging Stock Markets Factbook, 1990 and 1993.

The important point here is that if the purpose of the exercise is to deepen the stock market, it can be done in many ways other than through the development of private pension funds, as the experience of emerging markets during the past decade shows. In other words, although in Chile private pension funds may have helped to some degree in the expansion of the stock market, these are in general neither necessary nor sufficient for capital market development. To conclude, therefore, even in the case of Chile, the first link in the Bank's chain of causation is far from being as strong or robust as the Bank would like the reader to believe.

V. Capital Markets and Long-Term Economic Growth: Analytical Considerations

Turning now to the second link in the report's causal chain relating private pension schemes to long-term economic growth, how does the development of stock markets, banks and other financial institutions help achieve that objective? Following the earlier historical contributions of Goldsmith (1969), Cameron (1976) and Gerschenkron (1962) and the theoretical work of McKinnon (1973) and Shaw (1973), there has been in recent years a large and growing amount of research on this subject. One strand of this literature, which draws its inspiration from the endogenous growth models of Roemer (1989) and Lucas (1989), argues that financial intermediation, as well as the stock market, helps economic growth by *(a)* incre-

asing the rate of investment and *(b)* improving the productivity of investments.[9] The markets and the intermediaries carry out the functions of screening and monitoring investment projects, which individual investors on their own will find too uneconomic to undertake. These intermediary and market functions help diversify systemic risk and enable individuals to participate in investment projects which otherwise they might not have been willing to do. Thus, the economy experiences a higher rate of investment than would otherwise have been the case. Further, to extent that the financial intermediaries (e.g. banks) directly, and the financial markets (through for example the takeover mechanism), are actually successful in carrying out these monitoring and screening tasks, this should lead to an increase in the marginal efficiency of investment.

In this paradigm the effect of the growth of financial intermediaries and financial markets on private household savings is ambiguous. This is because, as Pagano (1993a) notes, one effect of financial intermediation is more efficient risk sharing which, depending on the individual's utility function, can have a negative effect on his or her savings. Atje and Jovanovic (1993) provide a model in which financial markets have a greater stimulating effect on economic growth than financial intermediation by the banks. This is because it is assumed that stock markets are more conducive to the development of venture capital and hence technical progress than the banks. Their cross-country empirical analysis suggests that countries that finance their investments more with equities and less with debt tend to grow faster, by a large margin— as much as 2.5 per cent a year. This leads the authors to inquire why "more countries are not developing their stock markets as quickly as they can as a means of speeding up their economic development".

This positive analysis of the effect of stock markets on economic growth stands in sharp contrast to the contributions of another very important school of thought, which stresses the negative impact of these markets on the rate of investment, on the time horizon of firms, on international competitiveness, and on economic development. Keynes may be regarded as the founder of this alternative view of the stock market. In a widely known passage from chapter 12 of his General theory, he observed:

> As the organisation of investment markets improves, the risk of the predominance of speculation does, however, increase. In one of the greatest investment markets in the world, namely, New York, the influence of speculation (in

[9] For a recent overview of these contributions, see Pagano (1993a).

> the above sense, i.e. "the activity of forecasting the psychology of the market") is enormous. Speculators may do no harm as bubbles on a steady stream of enterprise. But the position is serious when enterprise becomes the bubble on a whirlpool of speculation. When the capital development of a country becomes the by-product of the activities of a casino, the job is likely to be ill-done (Keynes, 1936).

It is ironic that the critical school is today increasingly influential in the United States and the United Kingdom, countries with the most developed stock markets and where such markets play a critical role in the economy. In the contemporary setting, the basic thesis of the school is that even with well-organized and complex stock markets such as those found in the Anglo-Saxon countries, the market does not in practice perform at all well its monitoring, screening and disciplinary functions.

The ability of the stock market to carry out these tasks depends crucially on the efficiency of two mechanisms: *(a)* the pricing process; and *(b)* the takeover mechanism (Singh, 1992). With respect to *(a)*, there is a growing amount of theoretical as well as empirical work which suggests that the real world share prices, although they may be reasonably efficient in Tobin's (1984) "information arbitrage" sense (i.e. any new information about a stock or the market in general percolates quickly and speedily to all players), do not reflect fundamental values. Research by this school suggests that the actual share prices generated even by the fully developed stock markets of London and New York are often dominated by speculators — the so-called "noise traders" — and by whims and fads, and are therefore not efficient in Tobin's "fundamental valuation" sense.[10] There is also evidence that, as Keynes had suggested, investors give disproportionate attention to near-term events and therefore do not have long time horizons (Miles, 1993).

This "short-termism" arising from the pricing mechanism is compounded by the failings of the takeover process. Empirical studies suggest that selection in the market for corporate control does not take place simply on the basis of efficiency (as measured, for example, by rates of return or by stock market valuation) but also very importantly on the basis of size.[11]

[10] There is a large literature on this subject. See for example, Modigliani and Cohen (1977); Schleifer and Summers (1990); Schleifer and Vishny (1990); Nickell and Wadhwani (1987);Poterba and Summers (1988). For a survey of the theoretical literature, see Camerer (1989).

[11] Again there are a host of studies on the subject. See, among others, Singh (1971, 1975); Meeks (1977); Ravenscraft and Scherer (1987); Scherer (1988). For an opposite point of view see Jensen (1988). For recent reviews see Singh (1992, 1993b).

Thus, a large, relatively unprofitable corporation has, other things being equal, a much smaller chance of being taken over than a small, much more profitable firm. A large firm can make itself further immune from takeovers by becoming bigger still through the process of takeover itself (Greer, 1986). Apart from this perverse outcome for the takeover disciplinary mechanism, there are both analytical arguments and empirical evidence which suggest that takeovers themselves contribute significantly to market myopia.[12]

The economists of the critical school further argue that these failures in the pricing and takeover mechanisms, and the consequent short-termism, put the stock-market-dominated US and UK economies at a competitive disadvantage with respect to countries like Japan and Germany. In the latter two countries, the stock markets, for historical reasons, have not been so significant in relation to industrial development. It is also notable that neither Japan nor Germany has a market for corporate control in the Anglo-Saxon sense of hostile takeovers, leveraged buyouts, etc.[13]

To sum up, the above analysis suggests that even with well-organized and complex stock markets, such as those existing in the United States and the United Kingdom, the stock market is unable to perform well its disciplinary and allocative tasks. An important implication of this view is that the stock markets in developing countries would fare even worse in these respects. This is because these countries do not yet have the accounting standards or possess in sufficient numbers information-gathering and -disseminating private firms or public organizations of the kind found in developed countries. The share prices in these emerging markets are therefore likely to be dominated by noise and speculation. Moreover, there will be relatively few firms with a long enough track record and reputation for the stock markets to be able to evaluate their long-term prospects sensibly. Hence, these markets are expected to exhibit much greater volatility than the advanced-country markets. It is suggested that, in these circumstances, the monitoring, screening and disciplining functions of the stock markets are better and more efficiently performed by financial intermediaries, i.e. the banks.[14]

A central analytical weakness of a stock market system with respect to

[12] Cosh, Hughes and Singh (1990); Froot, Scharfstein and Stein (1990); Stein (1989); Singh (1995a). For an alternative perspective see Marsh (1990).

[13] For further information, see Mullins and Wadhwani (1989); Odagiri and Hase (1989); Singh (1995b).

[14] Tirole (1991) makes this argument most persuasively in relation to the transition economics of eastern Europe.

the finance-industry relationship, industrialization and long-term economic growth is that it provides the individual investor with more or less ready liquidity. This is usually regarded as a virtue by the exponents of the stock market. As John Tagino, a former head of global equity trading at Merrill Lynch, put it in relation to the global equities market for leading corporations, "(it) gives the customer the ability to have instant liquidity at any time of the day or night he or she wants it".[15]

However, this "liquidity" also means that the investor need have no commitment to the long-term future of the firm. The bank-dominated financial systems are, by contrast, far better able to ensure such long-term financial commitment to their client corporations. Moreover, unlike the small individual investor in a stock market system who has no incentive to gather the costly information to supervise and discipline managers in management-controlled large corporations, the banks have both the incentive and the capacity to subject corporate managers to much more stringent such supervision. The German-Japanese types of banks are thus able to cope far better with the problems of asymmetric information, agency costs and transaction costs than the Anglo-Saxon stock market system.[16]

In the light of this important analysis of the critical school outlined above, the World Bank's assertion of an unequivocally positive relationship between capital market development and economic growth must be viewed with some skepticism.

VI. Stock Market Volatility and Economic Welfare

Stock market prices tend to fluctuate more than other economic variables, even in fully developed markets. However, a high degree of volatility is a negative feature of a stock market in that it can undermine the financial system as a whole; it also makes share prices much less useful as a guide to the allocation of resources. Moreover, to the extent that they discourage risk-averse savers and investors, stock market fluctuations may raise the cost of capital to corporations. After the 1987 stock market crash, several inquiries were undertaken in the United States (e.g. the Brady Commission) to see whether, as a result of financial liberalization and global trading or the introduction of new technology and devices such as programme trading, stock market volatility on the US market has increased, and how in any case it can be reduced. Evidence, however, indicated that

[15] Quoted in Cosh, Hughes and Singh (1992).

[16] There is a huge literature on this subject. For a recent review see Allen and Gale (1995).

volatility on the US market in the 1980s was much in line with the long-term historical record; it was in fact less in the past decade than in the 1930s (Schwert, 1989). Nevertheless, it remains a cause for concern, and several proposals were put forward to reduce share price fluctuations, e.g. suspension of share trading if the stock market index falls by more than a specific percentage in a trading period.

However, as predicted by the critical school, the capital markets of developing countries exhibit much greater volatility than those of advanced economies. Singh (1993a) provides evidence on this issue for the 1980s. His data showed, for example, that between 1984 and 1989, the standard deviations of monthly percentage changes in share price on the emerging markets were considerably larger than those on the US, UK or Japanese stock markets. Singh also reported that between 1982 and 1985, share prices on the Brazilian stock market rose fivefold (in US dollar terms); two years later they dwindled to 28 per cent of their 1985 value. In the first nine months of 1987, share prices on the Mexican stock market rose sixfold. However, following "Black Monday" in October 1987, prices fell to a tenth of their pre-crash level. In Taiwan, China, the largest Third World stock market, between 1987 and February 1990, the share price index rose by 330 per cent to reach a peak of 12,600; the index then fell to a quarter of its value (3,160) by September 1990.

To take a more recent case, the *Financial Times* reported on 18 September 1995:

> The Nigerian stock market All-Share index has doubled from 2,205 at [the] start of this year to 4,400 in early September. In the first eight months equities increased in value by 105 per cent in dollar terms, helped by a steady exchange rate. Although the economy is in recession and previously sound companies are struggling to stay in business, the rise in share prices coincides with unprecedented interest from both domestic and offshore investors.
>
> A partial devaluation of the naira at the start of the year, inflation of over 80 per cent, negative interest rates and fears of bank failure have persuaded many Nigerians that the stock market is the best place for their savings.

In the circumstances, the Nigerian share price boom would appear to be a speculative bubble which is likely to be pricked sooner rather than later, and thereby contribute considerably to share price volatility on that market. Davis (1995) has provided quantitative information on compara-

tive volatility of share prices in the mature and emerging markets for the period 1976-1991. He reports that during this timespan the monthly standard deviation of share prices was over 30 per cent in Argentina, 18 per cent in Brazil and 17 per cent in Taiwan, compared with 5 per cent for the United States and Europe and 7 per cent for Japan.

At an analytical level, the issue of stock market volatility is salient to the question of the welfare implications of the stock market versus bank-based financial systems. It of course bears directly on the question of the riskiness of the size of pensions, the retirees may expect to receive under the private pension plans. In formal economic models, Allen and Gale (1995) have demonstrated that the bank-based systems are much better than the stock market systems of intertemporal risk sharing; the latter, on the other hand, are superior with respect to cross-sectional risk sharing. As Allen and Gale observe:

> An illustration of the differences between the two financial systems in terms of their ability to smooth risk is provided by the experience of the 1970s and the 1980s. In the US, the real value of the stock market approximately halved after the oil shock of the early 1970s and stayed at this level for the rest of the decade. Households that had provided for retirement by investing in the stock market and needed to liquidate shares in order to pay for consumption were forced to reduce their standard of living substantially. By contrast, in the 1980s the stock market approximately doubled in real value and the process was reversed: households whose savings were invested in the stock market were able to increase their consumption substantially. The important point is that these US households bore substantial consumption risk over the two decades.
>
> The US experience can be contrasted with that of Germany over the same period. German households save for retirement and other purposes primarily in bank accounts and other debt-like instruments. Although Germany also experienced an oil shock, the value of these savings was not halved. German investors were able to consume the amount they had planned as banks drew on reserves to maintain payouts. In the 1980s there was a sustained boom in Germany as in the US. During this period the value of households' savings did not increase, since they were held in the form of fixed claims on the intermediaries. The intermediaries, however, were able to build up reserves. In contrast to the US case, we could argue, households did not bear as much risk from their savings because of intertemporal smoothing by intermediaries (p.190).

It may be argued that pension funds, because of their long-term liabilities, are likely to behave like banks rather than short-term liquidity traders or speculators. In principle, it is true that institutional share owners-

hip should lead to long-term value maximization and to "patient capital". However, in practice, analysis and evidence from both the United States and the United Kingdom suggest that, because of the particular structural features of institutional fund management, the opposite situation prevails. Fund management is a highly competitive industry and, increasingly, the performance of fund managers themselves is assessed on the basis of short-term results. This leads to high share turnover and acceptance of takeover bids on the basis of short-term financial gain rather than long-term industrial logic.[17]

The latter behavioral pattern is also connected with the phenomenon of "asymmetric pay-off". It is pointed out that there are sound reasons for fund managers to display a "herd" instinct: a fund manager who decides not to follow the "herd" and turns out to be wrong in his or her investment policies when the herd is right, may be subject to severe penalties, e.g. lose his or her job. On the other hand, if the herd is wrong and the fund manager is right, the pay-off may not be as great — it will usually take the form of a promotion or pay rise. Thus, faced with the prospect of an immediate stock market gain from a "takeover situation", the fund managers are more likely to accept it than not.

It may further be objected that, despite the theoretical advantages of bank-based over stock-market-based financial systems and the empirical evidence from rich countries in support of these propositions, the experience of developing countries, including Chile, with bank-based systems has not been a happy one. It is certainly true that in many less developed countries, bank-based systems have functioned unsatisfactorily and have not promoted economic growth. In a number of countries experiencing a high degree of macroeconomic instability, bank-based finance has tended to degenerate into inflationary or inefficient finance. Singh (1993a) calls attention to the following serious shortcomings of such systems in the developing country context:

- "crony capitalism", which leads to the diversion of financial resources to particular individuals and families with political connections instead of such resources being used to promote long-term industrial development;
- industry-finance links of the bank-based type, which can do in principle, and sometimes do in practice, lead to monopolistic positions in product markets and thwart entry by new firms, thereby hindering efficient industrial development;

[17] For a fuller discussion of this argument, see Cosh, Hughes and Singh (1990). See also Singh (1995b).

- imprudent or inadequate government regulation of the banks, which has sometimes jeopardized the integrity of the financial system as a whole (as, for example, in Chile, following financial liberalization in the early 1980s).

Thus, although bank-based systems are much to be preferred in principle to the stock-market-based systems, the developing countries should pay particular attention to questions of proper regulation and to the prevention of monopolistic abuse by the banks. After the debacle of the Chilean banking system in the early 1980s, what was required was prudential regulation of the bank-based system rather than expansion of the stock market, because of the capacity of the former to foster finance-industry relationships which are conducive to long-term investment and economic growth.

VII. The Capital Market, Corporate Finance, Savings and Investment

In the light of the foregoing discussion, we turn to the core issue in the World Bank's claim that its proposed pension system will not only "protect the old" but also "promote growth". Does the development of the equities and bond markets lead to a rise in national savings and investments? For this purpose we shall first examine the relevant data on corporate finance for developed as well as developing countries.

Table 5 gives figures on the financing of physical investment for non-financial corporations in Germany, Japan, the United Kingdom and the United States for the period 1970-89. In the context of the present discussion, the important point which emerges from the table is that the equity market's net contribution to investment needs of the non-financial corporate sectors of both the USA, the UK was negative over this period. What this indicates is that corporate new issues in these two countries were more than matched by a net redemption of corporate shares (mainly because of takeovers). In Germany and Japan, although new issues made a net positive contribution to corporate investment over the period considered, it was extremely small and amounted to no more than 2 to 3 per cent of the total.

Table 5 also indicates that in all four industrial countries in the sample, the main source for financing corporate growth was "retained earnings". To the extent that the companies use external funds to finance their investment needs, in almost all countries except the United States, bank finance was the most important source of outside funds.

At a theoretical level, it may be observed that this pattern of corporate

financing for the advanced countries — in which the firms seem to prefer retained earnings to debt, and both of these to new share issues (the so-called "pecking order" pattern of finance) — is compatible with rational profit maximization by the firm. Current models of corporate finance, based on theories of asymmetric information, agency cost, transaction costs, etc., can rationalize the observed "pecking order" in terms of normal profit maximization by firms without invoking any managerial theories of the firm (Myers, 1984).

Singh and Hamid (1992) and Singh (1995a) have recently provided among the first systematic large-scale studies of corporate finance in developing countries. Table 6, extracted from Singh (1995a), gives information on the financing of corporate growth for the hundred largest listed corporations from ten industrializing countries during the 1980s. These data show that the top developing-country corporations finance a very small proportion of the growth of their "net assets" (i.e. long-term capital employed by the firm) from internal sources. The median Korean corporation in the top hundred financed only a little over 15 per cent of such growth from internal sources during the 1980s (and the rest from external sources). The corresponding figure for the median top Thai corporation was a little less than 15 per cent, for the Mexican 23 per cent, for the Turkish 13.4 per cent, and for the Malaysian a little less than 30 per cent. Compared with the internal financing proportions for advanced countries, these would appear to be very low figures indeed.[18]

Table 5. Net Sources of Finance in Four Industrial Countries, 1970-1989(%)

	Germany	Japan	UK	USA
Internal	80.6	69.3	97.3	91.3
Bank Finance	11.0	30.5	19.5	16.6
Bonds	-0.6	4.7	19.5	17.1
New equity	0.9	3.7	-10.4	-8.8
Trade credit	-1.9	-8.1	-1.4	-3.5
Capital transfer	-8.5	-	2.5	-
Other	1.5	-0.1	-2.9	-3.8
Statistical adjustment	0.0	0.0	-8.0	-8.7

Source: Corbett and Jenkinson (1994)

[18] The information for advanced country corporations in Table 5 is based mainly on flow-of-funds data. The results are not therefore strictly comparable with those for developing-country corporations presented here. For further information, see Singh (1995a).

Similarly, the data in column 4 show heavy use of equity finance by large developing-country corporations to finance their growth of net assets. For all countries together, the median top developing-country corporation financed more than 40 per cent of its "net assets" growth from new share issues. For six of nine countries in the table, equity finance accounted for more than 35 per cent of the growth of net assets of the biggest corporations. Even though, for data reasons, the equity financing proportion for some countries may be overstated (for example Turkey), these figures are orders of magnitude higher than those for the advanced-country corporations (in Table 5).

The extensive resort to the stock markets by developing-country corporations is regarded by the exponents of the stock market as important evidence in support of the view that these markets benefit industrialization and development. It is indeed true that, unlike in the advanced countries, the market has in the stock market boom of the 1980s and 1990s been a genuine source of new finance for corporate expansion in developing countries. However, the important question is whether the fast growth of the stock markets in these economies has led to an increase in aggregate savings. Or is it the case that what has happened is simply the substitution of one form of saving (say bank savings or government bonds) for another (purchase of corporate shares on the stock market)? There is little or no evidence of an increase in aggregate savings for the sample developing countries as a result of the growth of the stock markets or of greater new-issue activity on these markets. In some of the countries (e.g. Turkey, Malaysia), the aggregate savings actually fell during the 1980s. Moreover, it is worth noting that in the advanced countries, the aggregate saving ratio in the stock market-dominated economies of the U.S and the U.K. is much lower than in Germany and Japan (where, as noted earlier, the stock market has only a peripheral role in relation to industrial development).

Similarly, there is little evidence that stock market development in the past decade or more in developing countries has led to an increase in aggregate investment. Evidence for India, for example, shows that, despite the boom conditions in the stock market in the recent period and hence the reduction in the cost of capital, corporate investment in fixed assets actually declined (Nagaraj, 1994).

Private pension schemes can, in principle, lead to a rise in aggregate savings, not just through the development of the capital market empirical

evidence on these issue is mixed and is far from being robust (Atkinson, 1995). In this connection, it is useful to examine the specific case of Chile. Table 7 provides the relevant data. The table shows a fall in total savings and investment over the period 1980-1991. There are, however, no clear trends and it is best to be agnostic. It would certainly not be valid to conclude from this evidence that pension reform led to a rise in national savings and investment in that country.

VIII. Foreign Portfolio Investment

We noted in the introduction the proposal from Reisen (1994) that, to cope with the pension crisis arising from rapid ageing, the old industrial countries should stimulate private funded pensions and seek maximum returns on pension assets. He added that pension managers can reap big diversification benefits — a "free lunch" in the form of a superior combination of risk and return — by investing in the emerging stock markets of the younger economies. He estimates that if OECD pension assets were invested according to world stock market capitalization, around $ 655 billion would have been held in 1992 in the emerging markets (rather than the estimated $ 11.5 billion). He therefore proposes that, to attract these pension and other institutional funds, developing countries should abolish exchange controls and other impediments to free capital flows. Similar advice has been given to developing countries by a WIDER study group chaired by Sir Kenneth Berrill (WIDER, 1990). The World Bank report also favours foreign portfolio diversification by pension funds, although it recognizes some of its negative aspects. Nevertheless it feels that its star pupil, Chile, was "too cautious" in not permitting AFPs to invest abroad until 1991.

Table 6. Financing of Corporate Growth for Top Listed Manufacturing Companies in Ten Industrializing Countries, 1980s (%)

	Tax retention ratio	Internal finance	External finance equity	External finance debt
Korea, Rep. of	65.7	15.8	46.9	3.0
Pakistan	65.9	67.5	5.2	23.9
Jordan	48.0	54.8	25.5	5.8
Thailand	48.7	14.7	na	na
Mexico	na	23.1	64.7	1.0
India	68.0	38.1	16.3	38.9
Turkey	37.8	13.4	66.6	38.9
Malaysia	51.7	29.7	48.0	12.0
Zimbabwe	61.7	57.0	43.5	0.0
Brazil	98.3	46.0	37.2	5.6
All	62.9	32.0	41.1	16.0

Notes: Growth is measured from the beginning to the end of the relevant period.
Tax retention ratio: average values, normally for the period 1980-1990.
Internal and external financing: median values.
na = not available.
Source: Singh (1995a)

Table 7. Savings and Investment in Chile (% of GDP)

Year	Pension savings	Other private savings	Total (1)	Public savings (2)	National savings (3)= (1)+ (2)	Foreign savings (4)	Total savings = investment (5)= (3)+ (4)
1980	0	2.8	2.8	11.0	13.8	7.1	21.0
1981	0.9	-1.8	-0.8	8.6	7.8	14.3	22.0
1983	1.7	8.2	9.9	-4.5	5.4	5.7	11.0
1985	1.8	8.6	10.3	0.8	9.5	7.8	17.3
1987	2.1	6.4	8.5	4.1	12.6	4.3	16.9
1988	2.7	6.0	8.7	7.6	16.3	0.8	17.0
1989	3.1	6.3	9.4	7.9	17.3	3.0	20.3
1990	3.3	8.5	11.8	5.5	17.3	3.0	20.2
1991	3.3	10.9	14.3	4.9	19.2	-0.3	18.8

Source: Uthoff (1993)

It is indeed true that there is considerable scope for foreign portfolio diversification in developing countries by pension funds in the industrial countries. Singh (1993a) reported that the correlations between share price movements in the Third World and those in advanced countries were generally low; for some emerging markets, the correlations were negative during the period 1984-1989.[19] It is of course possible that as the world capital markets become more and more integrated, the share price movements in emerging and developed markets will become more highly correlated. This, however, does not seem to have happened so far.[20]

Nevertheless, there is serious negative side to the foreign portfolio diversification which does not seem to have been given sufficient attention. Briefly, first, the abolition of capital controls will make the national economy much more vulnerable both to international macroeconomic fluctuations and to capital flight. Further, in view of the destabilizing feedback between the financial and the currency markets, it will make the task of exchange rate management, and hence of inflation, much more difficult. Second, other things being equal, stock market volatility could also adversely affect aggregate investment and the economy. In addition, for reasons explained earlier, stock market development may damage industry-financial relationships and harm investment, competitiveness and the real economy. Third, it is important to note that if the proposals are adopted, most of this portfolio investment is likely to go to a small number of the most developed Third World economies with large corporations and relatively well organized stock markets rather than to the majority of the poor countries.

The WIDER study group argued that fostering stock market development will, among other things, discourage capital flight and in fact bring flight capital back, since the market gives wealth holders an attractive alternative vehicle for domestic investment. The argument is plausible but deceptive. This is because capital flight is essentially a consequence of financial and macroeconomic instability; of course, in turn, it also exacerbates such instability. The existence of a stock market per se is unlikely to help in this respect. In unstable economic conditions, stock market volatility on the contrary could enhance financial instability and in fact lead to capital flight, not least by foreign portfolio investors. The aforementioned negative consequences of portfolio investment in emerging markets are

[19] See also Cosh, Hughes and Singh (1992).

[20] See Feldman and Kumar (1994) and Mullin (1993).

forcefully brought home by the debacle on the Mexican currency and stock markets at the end of 1994.

IX. Conclusion

The analysis of the previous sections has shown not only that the World Bank's proposed pension plans is flawed in terms of social policy but that is far from certain to enhance economic growth. Each of the links in the chain of causation relating pension funds to capital market development, and the latter to economic growth, can be seriously questioned on both theoretical and empirical grounds. The Bank has adopted a one-sided view, without much justification, of the relationships between these critical variables. Therefore, its proposed reform may neither protect elderly people nor achieve faster economic growth. On the contrary, the reform may contribute towards undermining growth while also exposing pensioners to greatly enhanced risks concerning the size and real value of their pensions.

None of this is to deny the serious difficulties faced by the existing pension systems in both rich and poor countries. However, the root and branch changes of the kind suggested by the report are not the only way of reforming the system, let alone the best way. Serious consideration should be given to the more balanced plans of the kind suggested by the ILO, which realistically confront the problem of pension reform while also adhering to minimum social standards.[21]

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[21] See, for example, Gillion and Bonilla (1992).

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FINANCIAL MARKET IMPLICATIONS OF PENSION REFORMS

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Abstract

The move towards funded system and the associated growth of pension funds' financial assets has made the financial market aspects of retirement income systems a key policy area[1]. The expansion of a funded pension sector requires the existence of a sophisticated financial market infrastructure. More generally, the importance of pension assets for financial markets may not been given enough policy attention in some countries, which has often focused more on the reform of public pension systems as a means of addressing fiscal problems associated with ageing populations.

This paper focuses therefore on the main financial policy challenges arising from the rapid growth of pension fund assets. Several key issues arise: how demographic developments affect the case for greater reliance on advance-funded systems; the macroeconomic implications of a major growth in their importance, including the impact on international capital flows; and the implications for retirees who rely to a major extent on income from advance-funded systems, as opposed to other sources of income.

Against this backdrop, policy makers will need to assess the policy implications of: the likelihood that governments may find themselves "bailing out" pension institutions that are unable to meet their obligations; the way in which investment policies of funds should be regulated, and the role of risk management and risk accounting. Moreover, the growing reliance on private pension schemes calls for an assessment of the adequacy of the regulatory framework, while an effective supervisory oversight of the financial situation of pension funds is indispensable for the development of sound private systems. Finally, the implications for the financial markets themselves of the accumulation of vast amounts of savings by pension funds that will need to be invested in financial markets means that financial policy makers need to understand the in-

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[1] Hans J. Blommestein (1995). Structural Changes in Financial Markets: Overview of Trends and Prospects, in: *The New Financial Landscape*, OECD; H. J. Blommestein (1998). The Impact of Institutional Investors on OECD Financial Markets, in: *Institutional Investors in the New Financial Landscape*, OECD.

vestment and trading strategies of pension funds and other institutions involved in the provision of retirement income.

I. Introduction

The ageing of populations in the developed countries could significantly affect financial markets across the world. Fiscal developments suggest that, in one form or another, workers will be funding their own retirement. This implies that many countries will have to reform their pension systems from PAYG-financing to pre-funding. The resulting capital flows will be substantial, and well-functioning financial markets will be crucial to providing retirement income. Because of the size of these flows, they should promote the increased breadth and depth of financial markets. Furthermore, the demand for retirement income should encourage the creation of new financial instruments.

This paper examines the probable effects that the rapid growth of pension funds will have on financial markets and their implications for government policy. The first section details the recent growth of pension funds and the future implications of continued pension fund growth on financial markets. The second section lists some of the consequences to these developments. The last section then provides some general guidelines for financial market policy to ensure that the adverse consequences are avoided and that financial markets can help ensure future retirees pensions and the future living standards of all members of society.

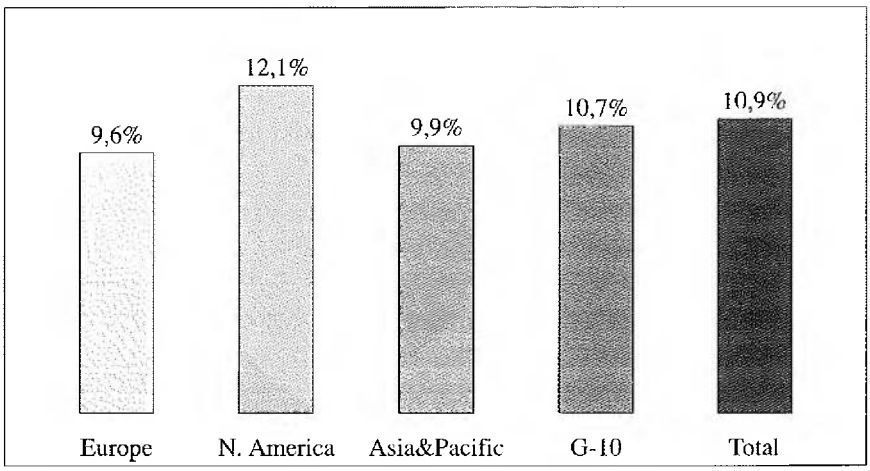
II. The Recent Growth of Pension Funds

The past decade has witnessed a pronounced expansion of pension fund assets. Over the period 1990-96, the average annual growth of these assets was 10.9% (Chart 1).[2] As a result, total pension assets in the OECD area rose from almost 29% of GDP in 1987, to almost 38% of GDP, or around $ 8.7 trillion, in 1996. These aggregate figures conceal a great variation among individual OECD countries. Pension fund assets total more than 110% of GDP in Switzerland, nearly 90% in the Netherlands and around 60% in the US but only 2-5% of GDP in France, Germany and Italy [Table 1]. This range provides a broad indication of the scope for further growth of pension fund assets in some ageing countries. Clearly, a susta-

[2] This understates the financial importance of population ageing and pre-funded systems because life-insurance companies and mutual funds are involved in retirement income products. Unfortunately, no reliable data are available concerning their importance for financial markets.

ined move toward a more fully funded pension system in the latter group of countries would have an enormous effect on the size and nature of their individual capital markets.

Chart-1: Average Annual Growth Rate of Total Asset Holdings by Pension Regional Breakdown, 1990-1996



Source: OECD.

Along with the growth in total pension assets in recent years, there has been a shift in the investment allocation of pension funds toward higher-yielding, riskier assets. For example, equity holdings of pension funds increased remarkably in the period 1990-1996. The increase in equity holdings was largest in North America, while Asian-Pacific pension funds recorded the lowest increase (Chart 2).

Pension funds have begun to diversify across borders, although this trend remains tentative, as a small portion of pension funds' assets are currently invested in foreign assets. In G-10 countries with significant pension fund holdings, the share of foreign assets increased from 12% in 1990 to 17% in 1996. Among G-10 countries, only pension funds in Belgium, the Netherlands and the United Kingdom have very significant foreign asset holdings [Table 2]. Furthermore, little of this international exposure is in emerging markets.[3] All the evidence indicates that all types of instituti-

[3] Surveys suggest that US pension funds and mutual funds currently have about 2% of their assets invested in emerging markets. Emerging market exposure of UK pension funds and mutual funds is somewhat higher (3-4%) but Japanese and continental European institutional investors have negligible emerging market assets in their portfolios.

onal investors are much less internationally diversified than the world market portfolio. Pension fund portfolios display a strong home bias.[4]

Table-1: Total Assests of G-10 Pension Funds as Percent of GDP

	1987	1988	1989	1990	1991	1992*	1993	1994	1995	1996
Belgium	2.4	2.4	2.7%	2.5	2.7	2.5	2.8	3.1	3.7	4.1
Canada	26.4	26.8	28.7%	30.0	32.0	32.8	35.7	37.7	41.0	43.0
France	0.0	0.0	0.0%	3.4	3.5	3.2	3.3	3.8	4.3	5.6
Germany	3.4	3.1	3.4%	3.3%	3.5	5.1	5.5	5.4	5.2	5.8
Italy	-	-	-	-	0.6	1.1	1.7	2.2	2.6	3.0
Japan	38.0	33.7	31.8%	37.4	37.9	37.3	41.0	49.4	40.6	41.8
Netherlands	45.5	72.7	81.6%	78.4	81.1	72.1	83.5	85.0	86.6	87.3
Sweden	33.4	30.9	30.6	31.0	38.6	29.6	27.1	25.7	30.5	32.6
Switzerland	74.7	64.5	71.3	72.5	75.5	74.7	82.2	86.5	104.3	117.1
UK	62.3	58.2	65.0	59.7	64.1	58.2	72.4	69.2	73.2	74.7
USA	35.7	36.8	36.3	38.1	48.0	48.2	53.4	50.6	58.9	58.2

Source: OECD, 1998.

III. The Implications of Pension Fund Growth

One implication of the ageing of populations in the OECD area and the associated growth of pension fund and other institutional assets is the increased demand for professional fund management services. Professional portfolio managers, in turn, have an important influence on financial markets through investment and trading strategies.[5] Countries with large funded pension schemes tend to have highly developed securities markets, while capital markets are relatively underdeveloped (in particular the equity market) in countries with small pension-fund sectors.[6]

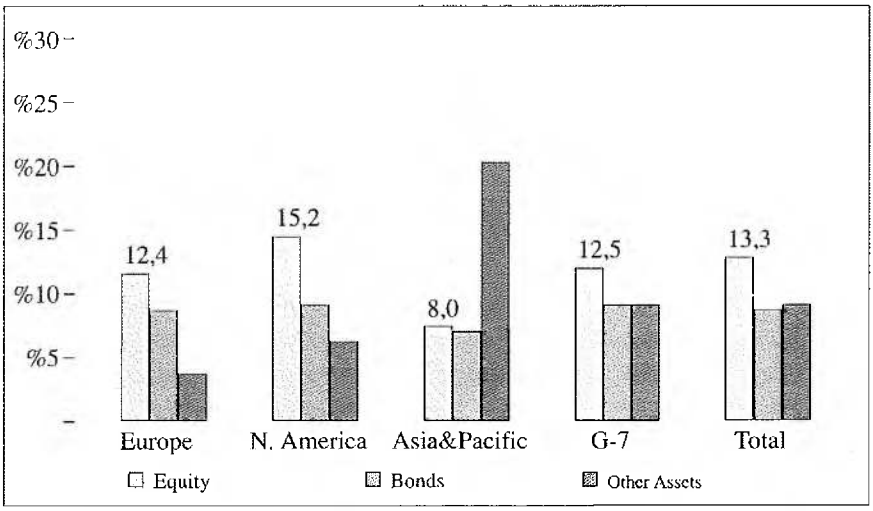
The increasing importance of pension funds should also encourage the development of different types of assets that are of interest to holders of such funds as fund managers compete for funds. For example, recent evidence for the United States indicates that the expected pay out on annuity

[4] Reasons for this home bias are given in OECD Financial Market Trends no 68, November 1998.

[5] The growth of a dynamic institutional sector may contribute to a stronger role of capital market intermediation. In particular, pension funds that are investing significant parts of their portfolios in equities would pressure for changes in laws and regulations of companies that usually can be found in "bank dominated" financial systems. Modernisation in turn would promote the growth of securities markets because they become more attractive for investment by pension funds.

[6] During 1996, net private capital flows increased by 22 percent to a record level of $235 billion [see Table 13 in IMF (1997), International Capital Markets, Washington].

Chart 2: Pension Funds' Annual Average Growth Rate of Equities, Bonds and Other Assets, Regional Breakdown, 1990-1996



Source: OECD/DAFFE, 1997.
Notes: Other Assests: Including non-financial assets, cash, loans and other financial assets.
Asia–Pacific including Japan, Korea, Australia.

policies has increased significantly in recent years.[7]

The trend toward more investment in foreign assets, especially in emerging markets, can also be expected to continue. The scale of flows from the mature industrial countries to the "younger" emerging markets and the broadening of market access constitute evidence that in the 1990s, global financial market integration is rapidly increasing.[8] With continued efforts to liberalise cross-border financial flows and to strengthen capital markets in developing countries, this trend is likely to persist as pension funds and other institutional investors continue to seek to achieve greater diversification of portfolios.

All of these developments serve to increase the breadth and depth of financial markets across the world. They also facilitate greater diversificati-

[7] For example, Heston and Rouwenhorst found that diversifying across countries, but staying within a single industry, reduces volatility more than diversifying across industries in a single country, even though both portfolios carry the same average return; S. Heston and G. Rouwenhorst (1994), Does Industrial Structure Explain the Benefits of International Diversification?, Journal of Financial Economics, August.

[8] The real return on US stocks averaged 9% over the period 1947-96 with a standard deviation of 17%. This means that there is about a 30% probability of a decline bigger than minus 8% or a rise bigger than 26% in any given year.

Tablo-2: G-10 Pension Funds Holdings of Securities Issued by Non-Residents (in Per Cent of Total Assets)

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Belgium	34,1%	37.4%	33.4%	30%	29.4%	29.2%	34.3%	33%	35.8%	35.4%
Canada	-	5.9v	-	7%	9%	11%	12%	14%	14%	-
France	-	-	-	-	-	2%	2%	5%	4.4%	-
Germany	-	-	-	4.5%	4.5%	4.3%	4.5%	7%	5.3%	7.7%
Italy	-	-	-	-	-	4%	4%	5%	-	-
Japan	14.3%	14.8%	14.3%	16%	14.8%	14.4%	14%	10.8%	12.5%	14.9%
Netherlands	12.8%	13.3v	15.2%	15.8v	14.9%	17.1%	19.7%	22%	21%	30.2%
Sweden	-	-	-	-	-	-	-	11%	9.1%	14.8%
Switzerland	4%	4%	4%	4.2v	6%	6%	6%	13%	16%	18.6%
UK	14%	17v	22%	20v	23%	24%	27%	27%	26.8%	29.2%
USA	2,5%	2.9%	3.7%	3.5%	3.9%	4.3%	8.1%	8.1%	9.1%	10.4%

Source: OECD, 1998.

on of pension fund portfolios. Fund managers thus can improve the return-to-risk ratio of the portfolios, which would help ensure that there are sufficient funds to pay the benefits to retirees. These developments also should improve the flow of funds from savers to investors, leading to a more efficient allocation of resources in the economy. As such, these developments will help to improve living standards for all members of society.

IV. Some Caution about Rapid Pension Fund Growth

Although rapid pension fund growth provides many benefits which will help countries to manage the problems associated with ageing, there are a number of reasons to be cautious about these benefits if the process is not handled well. A key aim for government policy will be to mitigate these possible negative effects.

First, governments need to exercise great care in extrapolating rates of return realised over a relatively short period of "boom" conditions to claim that this will "solve" the problems associated with ageing. Even the long-term evidence does not lead to straightforward conclusions, except that equity is *much* more risky than fixed-income instruments. For example, based on data over the past 50 years, it can be shown that the US stock market is quite likely to decline 8% or to rise 26% in any given year, whereas the average return on bonds is much lower but also

less risky.[9]

Furthermore, the greater presence of institutional investors in financial markets could increase volatility. The use of sophisticated computerised portfolio insurance/program trading strategies by pension funds and other institutional investors is desirable because they may help to move prices more quickly to their fundamental values, though this may lead to an increase in short-term volatility. However, if such investment strategies induce herding and "noise" trading, then the possible rise in volatility may waste resources and be welfare decreasing.

Increased diversification in some directions, especially in the direction of emerging markets, may not be beneficial as they first appear. For example, over the last ten years, the G-7 stock markets have given better returns than the emerging markets. Naturally, the future might bring better news in terms of higher expected returns and/or lower risks, especially in the light of the expected ageing-induced pressures on financial returns in the industrial countries and further improvements in the financial infrastructure in emerging securities markets as well as strengthening of the domestic institutional investor base.[10]

Beyond this, however, analysts have pointed out that the benefits of international diversification may be decreasing.[11] It is argued that increasing financial integration is leading to an increase in correlation of returns, which reduces the potential for reducing risk through international diversification. Moreover, the fact that an increasing amount of institutional money is managed using diversification is causing the benefits of diversification to become smaller. High correlation of returns between countries has in some cases led to a restructuring of portfolios by diversifying across sectors.

The potential benefits of international diversification are also reduced by the fact that downside market movements occur much more in parallel

[9] Several caveats are in order when interpreting these results. First, it is not possible to control for other determinants of investment performance such as macroeconomic policies, structural factors, and other features of the regulatory regime. Second, to get more conclusive answers it would also be necessary to take into account the details of the institutional investment infrastructure such as the structure of the asset management industry, the "style" of investment, and the investment strategies.

[10] Several industrial countries have not established the proper legal and regulatory basis for dealing with take-overs, minority shareholders protection, insider trading and institutional investor operations [see OECD, (1997), The Impact of Institutional Investors on OECD Financial Markets, Financial Market Trends 68, November 1997].

[11] The IMF concludes that despite all the structural changes that have occurred in the new financial landscape, the potential sources of capital flight remain the same [IMF (1997), International Capital Markets, Washington].

than upside ones. A recent study shows that shocks in volatility are closely linked with rising correlations, in particular in the case of stock markets.[12] Unfortunately, the fact that most assets seem to move uniformly during market crash situations reduces the benefits of controlling downside risks using investment strategies based on diversified benchmarks.

Although there is evidence that the risk-reducing benefits of international investments have become less powerful, studies show that they are still positive, even during sharp downside moves of securities markets.[13]

V. Implications for Policy

Risk is ever present in financial markets. It is conceivable that returns on pension funds could at times prove to be insufficient to provide adequate pensions to retirees. The pressure in such cases for governments to "bail out" pension funds so that retirees are adequately compensated will probably be overwhelming. Accordingly, it is in governments' interests to ensure that financial markets work well so that pension funds can secure sufficient returns without taking on excessive risk.

Although the previous section discussed some potential shortcomings for diversification into foreign markets, the fact remains that a well-diversified fund will be best able to balance desires for return against potential risks. The guiding principle for government policy then should be to provide the regulatory and supervisory structure that will enable funds to effectively diversify. The rest of this section discusses the implications of this principle for government policy.[14]

The first implication is that it is necessary for those making the risk-return trade-off decisions on behalf of pension beneficiaries to be well-informed, to have the proper incentives and to be adequately supervised. A supervisory framework based on prudent-man principles and sound risk management standards, is better adapted to this purpose than an approach

[12] Private sector capital flows to emerging markets fell from $295.2 billion in 1996 to $ 199.6 billion in 1997. This decline was entirely due to the five Asian countries hit hardest by the recent crisis — Indonesia, the Philippines, Malaysia, South Korea and Thailand — who suffered in 1997 a net outflow of $12 billion, compared to a net inflow of $93 billion in 1996 [Financial Times, Capital Flows to Emerging Markets Fall, January 30, 1998].

[13] However, it is of interest to note that when the five Asian countries hit hardest by the crisis are excluded, flows to other emerging markets rose from $202 billion in 1996 to $212 billion in 1997 [Financial Times, Capital Flows to Emerging Markets Fall, January 30, 1998]. This demonstrates that contagion effects were contained to some degree.

[14] The IMF (1997) notes that the growing participation of institutional investors in international markets and improved access of emerging markets to the international capital market have "led to the growth of highly leveraged hedge funds and proprietary traders who are prepared to tolerate significant risk in their search for weaknesses in foreign exchange arrangements....". [IMF (1997), International Capital Markets, Washington].

with "blunt" quantitative restrictions on asset allocations.

Although it is difficult to isolate the impact of different aspects of the regulatory structure on the investment performance of pension funds, comparing the aggregate returns on pension fund portfolios in countries with "prudent man" investment rules with those of countries with quantitative restrictions can give us a rough idea. Since 1984, returns on pension fund portfolios in countries using prudent man principles have been 2.5 to 4% higher than returns in countries using quantitative limits (Table 3).

Table-3: Return on Pension Fund Portfolios 1984-96 (mean of real total return in local currency)

	1984-1993	1984-1996
Belgium	8,8	9,0
Denmark	6,3	6,0
Germany	7,2	7,0
Ireland(*)	10,3	11,0
Japan	6,5	-
The Netherlands(*)	7,7	8,0
Spain	7,0	-
Sweden	8,1	-
Switzerland	4,4	4,0
UK(*)	10,2	10,0
USA(*)	9,7	9,0
Prudent Man	9,5	9,5
Asset Limits	6,9	5,2

Sources: EFRP Report, June 1996; Pragma Consulting; and OECD staff Calculations.
Note: (*) Countries with prudent man principle

The evidence examining longer periods confirms this conclusion. Over 1967-1990, pension funds' portfolio returns exceeded real wage growth in prudent man rule countries while the difference between returns and wage growth was on average zero in countries with quantitative limits. Since differences of 1 or 2 percentage points on the return of pension fund assets can make an enormous difference to both contribution rates and retirement benefits over a life-time, it is important that governments not unnecessarily hamper the investment policies of pension funds.

A second implication for policy is to recognise that financial innovations can improve the functioning of financial markets. Government regulatory actions can do much to either mitigate or aggravate the dysfunctio-

nal aspects of financial innovations. The "correct" policy response to financial innovations will enhance financial stability without hampering the entrepreneurial activities of financial market participants. The process of financial innovation has been driven strongly by the growth of pension funds and other institutions involved in the retirement sector (mutual funds and life insurance companies). The role of public policy in "optimal" pension plan design is to act as a catalyst for the development of new and better retirement products.

The third implication is that financial market infrastructure influences the ability of pension funds to implement asset investment strategies in accordance with planned or desired risk-return profiles. A well-functioning funded pension system requires a stable and efficient financial market infrastructure consisting of the legal framework, the financial accounting system, the regulatory and supervisory framework, clearing and settlement systems, and the micro-structure for trading securities.

Most industrial countries have made considerable progress in the development of a solid regulatory and supervisory framework, although much still needs to be done. Differences in disclosure requirements among countries are marked, partly due to different legal systems. Recent financial turbulence in Asia and other emerging financial markets demonstrates that lack of transparency and inadequate disclosure standards can prolong or exacerbate a confidence crisis.

Accounting and auditing standards are important to the effective management of risk. Accounting standards are important because disclosure will be effective only if the financial information provided by the company is based on solid accounting principles and practices. Common accounting standards are essential for pension funds to be able to assess accurately the "value" of investments. In parallel, auditing standards and practices also need to be high enough to ensure the reliability of disclosed information.

A fundamental principle of risk management, as applied to pension fund asset allocation, is that benefit security is maximised when assets are matched to contractual benefits with respect to maturity and unit of account. However, higher returns can only be obtained by taking on higher risk, i.e. by deviating from this "fundamental" principle. For this reason, internal and external asset managers of pension funds will need to adopt integrated risk management systems that allow for a careful definition of investment risks in relation to pension funds' expected liabilities.

The role and scope of regulations on pension funds should be considered by taking into account the extent to which the implementation of sound risk management standards for pension funds can be linked to a relaxation of regulatory constraints concerning asset allocation. There is an interesting parallelism here with the recent discussion on the balance between capital adequacy standards for banks and the supervision of their in-house risk management systems.

The last implication is that the public management of international systemic crises will become more important as pension funds continue to diversify into international markets. One lesson from recent events is that the abrupt loss of access by individual countries to the global capital market may continue to occur. This is due to two factors: divergent macroeconomic conditions in capital-exporting and capital importing countries and crises in individual capital-importing countries. In such cases, the currency of the capital-importing country will be "tested" through a sustained speculative attack, leading to a sudden drying-up of capital inflows and major capital outflows.

The globalisation of financial markets, driven in part by population ageing and other structural factors, is reflected in the quicker international transmission of short-term price movements in financial markets, as occurred in the Mexican crisis in 1994-95, the Asian crisis in 1997-98, and the Russian financial crisis starting in the second-half of 1998. Financial integration has also increased the potential intensity and duration of speculative attacks. There is evidence that pension funds and other institutional investors play a crucial role at times in determining asset prices in emerging financial markets, with shifts in institutional investor sentiment resulting in periods of bubble-like booms and bursts and highly volatile financial markets. Effective public management of systemic risks thus is essential to restore confidence to investors and to curb unnecessary volatility.

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PROSPECTS FOR PRIVATE PENSION SYSTEMS AND THEIR RELATION TO THE STOCK MARKET IN TURKEY

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Abstract

The study aims to analyze the Turkish pension system and its organizations (Social Security Fund, Pension Fund and Self-Employers Security Administration) as a whole and investigates the possibility of a private pension system in Turkey. The Turkish pension system has become an expensive one in terms of deficits in the recent years. Therefore, the deficit should be eliminated in the short-run; so that, the system should contribute significantly to a fair income distribution, employment, and economic growth through the stock market. The Turkish pension system is not functioning properly because of excessive political interventions, mismanagement, and deteriorated active-passive ratio. Having discussed this subject, the private pension system will be articulated taking into consideration the years 2020 and 2050, along with a presentation of the successful Chilean Pension System. The investigation of whether a private pension system in Turkey would be possible depends on some bottlenecks which need to to be resolved. The most significant bottleneck is the Turkish income distribution which is one of the worst in the world. 60 percent of the population receive only 25 percent of the GNP. Therefore, it is unfeasible to expect this group to pay pension premiums on a regular basis in the short-run. It might be possible in the medium-and-long-run. Should the government pays the premiums for this group, however, funds amounting to US$ 4.25 billion is calculated to flow into the stock market in 2000, and gradually increasing to US$27 billion in 2050 which will make a significant impact on the economic growth.

I. Introduction

The pay-as-you- go pension system is one of the most costly programme funded by the Turkish government in the recent years. The Treasury has supported the system with increasing rates since 1992. The total support accounted for one-fourth of the budget deficit in 1995 and one-third in 1996 and 1997. These deficits are almost the same amount as investment

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expenditures undertaken by the government. Despite this alarming situation, social security and social services in general are at low and insufficient levels. Neither people nor the government is pleased with the existing system. Even based on conservative assumptions, the cost shows a clear tendency to increase in the future, both in absolute terms and as a percentage of GDP. Indeed, should the present system continue with the existing premiums (21.5 percent for Sosyal Sigortalar Kurumu -SSK "Social Security Administration", 35 percent for Emekli Sandığı "Pension Fund" and 20 percent for Bağ-kur "Self-Employers Security Administration"), these three systems will have a total deficit/GDP ratio of 2.7 percent in 2000, 3.45 percent in 2005, 4.31 percent in 2010, 5.58 percent in 2020, 6.98 percent in 2030, and 10 percent of GDP in 2050 on the basis of 1995 prices. (Sosyal Güvenlik ve Saglik Sigortasi Reform Projesi, Sosyal Güvenlik Nihai Raporu, Ankara, 1996).

The goal of this study is twofold: i) A short analysis of the existing pension system in Turkey, and ii) investigating the possibility of the private pension system on a complete or partial basis. Nevertheless, it should not be seen as an offer for a completely new system.

There are three main observations:

a) The pay-as-you- go system is diverted toward bankruptcy system, (i.e., an incapability to supply the promised benefits out of its own resources).

b) A new system of private Pension Saving Accounts (PSA) is superior to the present system, both for workers and society as a whole.

c) A gradual transfer of the system from the present system to PSA is possible.

In order to elaborate observation (a) above, a critical analysis of the present system is necessary. There are a number of exogenous parameters, such as population projections, the growth rates of employment, GDP, and real wages. A conclusion has been reached that the present system is not viable, in particular, with regard to maintaining contributions and benefits. As wages and salaries increase, contributions made by the active participants have also increased. Moreover, higher wages and contributions mean bigger pensions in the future. The possibility of the Turkish pension system to carry this heavy burden is questionable. Alternatively, it is possible to make adjustments to the present pension system and to reduce deficit, which will require higher contributions from the existing members, extension of the retirement age, including workers who are not in the system or lowering benefits for future pensioners. These adjustments are un-

likely to reduce the deficit and to slow down the rate of increase.

II. The Reason for Searching a New System

There are three public pension systems in Turkey: Emekli Sandığı (Pension Funds), Sosyal Sigortalar Kurumu-SSK (Social Security Administration) and Bag-kur (Self-Employers Security Administration). The SSK is subject to most of the discussions, since its deficit is the largest among the other systems. Therefore, the existing situation is focused on the SSK. The SSK has reached the bankruptcy point for a number of reasons:

A. Political Interventions: Early retirement programmes, "super retirement" programmes, admittance of new members to the SSK without any provisions to actuarial calculations are the main political interventions to the SSK. In addition, each retired SSK member receives "social aid" without paying any premium. This accounts for 60 percent of the payment made to retired members.

Early retirement programme receives a particular attention. Retirement age was 60 in 1950. Since then, a number of changes have occurred in the legislation and the retirement age declined, in the most extreme cases, 38 for women workers and 43 for men, if they have paid premium for a certain time. Although the ratio of "young retirees" in the total is small, it is rapidly increasing. Turkey is one of the few countries in the world that allows for retirement without any age obligations. The average retirement age is 63 for women, and 65 for men in the OECD countries. Life expectancy from birth is 80 and 74, respectively, in the OECD. Table 1 provides a comparison of the retirement ages in some selected countries. As it can be seen, the retirement age is 57 for women, and 59 for men in Libya, India, Pakistan, Syria, and Zaire where the life expectancy is about 60. These countries are lower income countries.

Table 1: Retirement Ages and Life Expectancy from Birth in Selected Countries

	Retirement Age		Life Expectancy from Birth	
	Women	Men	Women	Men
Turkey	38	43	71	66
OECD Average	63	65	80	74
USA, Germany	65	65	79	73
Austria	60	65	79	73
Australia	60	65	81	75
Belgium	60	65	80	73
Denmark	67	67	78	73
Finland	65	65	80	72
France	60	60	81	73
Netherlands	65	65	81	75
UK	60	65	79	74
Ireland	65	65	78	73
Low Income Group	57	59	58	55
Libya	65	65	n.a.	n.a.
India	60	60	61	61
Pakistan	55	60	63	61
Syria	55	60	n.a.	n.a.
Zaire	60	62	n.a.	n.a.

Source: (Gelişmiş Ülkelerde ve Türkiye'de Sosyal Güvenlik Sistemlerinin Yeniden Yapılandırılması, TİSK İnceleme Yayınları, 18, Yayın No. 160, 1995). (n.a. not available)

Life expectancy from birth is a good indicator, but since most people begin to work at the age of 20's, life expectancy for working people would be a more explanatory parameter. Table 2 provides life expectancy for Turkey between the base period of 1990-1995 for the different age groups over 20.

Table 2: Estimated Life Expectancy for the 1990-1995 Period (Year)

Ages	Women	Men	Average
20+	54,12	50,35	52,19
30+	44,65	41,23	42,90
40+	35,32	32,09	33,69
45+	30,75	27,65	29,16
50+	26,32	23,43	24,84
55+	22,04	19,51	20,74
60+	17,94	15,90	16,89
65+	14,13	12,62	13,36

Reference: (Gelişmiş Ülkelerde ve Türkiye'de Sosyal Güvenlik Sistemlerinin Yeniden Yapılandırılması, TİSK İnceleme Yayınları, 18, Yayın No. 160, 1995).

As it is clear from the table, life expectancy for the Turkish people is getting longer, while the retirement age is getting low. The gradual ageing of the population means that the ratio between active workers and retired people will get smaller and smaller in the future.

B. Active-Passive Ratio: As a result of the above situation, the active-passive ratio (ratio of working people who pays premium to retired people who get benefits, i.e., retired people per worker) has changed dramatically over time. Table 3 provides a clear idea about such a change for the SSK.

Table 3: Active-Passive Members and Ratio for the SSK

	Active Members	Passive Members	Ratio
1975	1.823.338	289.970	6.29
1980	2.204.807	635.815	3.47
1985	2.607.865	1.070.681	2.44
1990	3.446.502	1.596.634	2.16
1995	4.370.000	2.337.755	1.87

Reference: (Gelişmiş Ülkelerde ve Türkiye'de Sosyal Güvenlik Sistemlerinin Yeniden Yapılandırılması, TİSK İnceleme Yayınları, 18, Yayın No. 160, 1995).

According to Table 3, the number of active member increased 90 percent between 1980 to 1995 while passive members increased 240 percent during the same period. The average size of family an active member has reached 3.8 i.e., an active member takes care a family of 3.8 and a 1.8 retired passive members. This is a heavy burden on the working class. One should take into consideration the underground economy and workers who are not registered to the SSK. It is estimated that only half of the workers are registered to the SSK.

Another significant and alarming situation with the Turkish employment statistics is a misleading point: the labour participation ratio is declining in Turkey. Students, retirees, housewives, disabled people are excluded from this ratio which was 50 percent in 1997, considered as one of the lower rates in the world. The same rate was 70 percent in the mid 1970s. This ratio gives a misleading impression about unemployment rates. This ratio may be lower because of the increase in housewives and retirees.

Table 4: The Number of Members and Pensioners (in 000s)

	1980	1982	1990	1993	1996
Pension Fund (Emekli Sandığı)					
Members	1.250	1.350	1.560	1.601	1.878
Pensioners	495	569	843	951	1.048
Social Security Administration (SSK)					
Members	2.204	2.265	3.446	3.950	4.624
Pensioners	567	808	1.596	1.935	2.539
Self-Employers Security Administration (Bağkur)					
Members	1.100	1.204	1.967	2.872	1.854
Pensioners	138	194	596	744	874

References: S. Canbaş and H. Doğukanlı, Finansal Pazarlar, Beta Basım 1997, for 1982 and 1983; TÜSIAD, Türk Sosyal Güvenlik Sisteminde Yeniden Yapılanma, Istanbul, 1997.

Table 4 reveals a rapid increase in the number of members and pensioners. The number of Emekli Sandığı members increased by 50 percent, while the number of pensioners increased 100 percent between 1980 and 1996. The number of SSK members and pensioners increased by 100 percent and 400 percent, respectively, while the number of Bağkur members and pensioners rose by 50 percent and 500 percent , respectively. The total number of members have increased from 4,434,000 in 1980 to 8,430,000 in 1996 and the number of total pensioners rose from 1,214,000 in 1980 to 4,520,000 in 1996. The number of dependents, on the other hand, have reached 36,254,000 in 1996 from 15,483,000 in 1980.

C. **Mismanagement:** Mismanagement of the SSK is one of the reasons for its current situation. (This does not imply the others are well-managed). This is not, however, an internal problem of the SSK. Rather, it is related with political intervention of the government. The government has a significant share in the administrative body of the SSK along with businessmen and workers. This provided successive governments to utilize the SSK's revenues in a number of ways to finance budget deficits, such as low interest- paid government bonds, or low-cost home credits and real estates. Moreover, various state agencies, such as municipalities, state economic enterprises, along with some private firms do not pay their premiums regularly.

D. High Premiums: In the past, frequent increases in premiums were seen

as the easiest way of reducing the SSK's deficit. As a result, Turkey is one of the countries in the world where the highest rate of premiums are paid, although the premiums are low. This situation generates a low effective rate. Workers contribute 14.5 percent while employers pay 19.5- 26.5 percent which totals 34- 41 percent. This situation increases labour costs, reduces employment or encourages employment of unregistered workers. Therefore, there is a dilemma: either more unemployment or lower benefits for the existing or future pensioners.

In short, the present pension system represents an ever-increasing cost for the workers, the state, and the economy as a whole. The proposal for reforming the existing system is raising the age of retirement and changing the formula for calculating their pensions. The workers will never know the cuts in their benefits will be decided by the legislator in order to prevent similar crises, i.e., the cost of solving the problem will increase.

There is one another reason for searching a reform: It is believed that the creation of a system based on private saving accounts, administered by the private sector under competitive conditions, generates such an environment even if the pay-as-you-go system is financially suitable. A similar system has been employed in Chile since 1981. There are some doubts about the success of the system, but it has generally been accepted as a successful one. Today 9 out of 10 workers in Chile are in the private saving account system and they have received an average return rate of 12 percent above inflation since 1981. The system guarantees the pensioners that their pensions will be updated in accordance with the change in inflation.

III. The Private Saving Account System (The New System)

The technical part of the following information is derived from the web site of the International Center for Pension Reform (headquarters in Chile). The idea of private saving account is a simple one: A structural reform that has the ability of solving the pension problem once and for all. The worker's monthly savings are deposited in an individual saving account. This account belongs to the worker. It increases (in shorter periods negative returns are possible) by safe and diversified portfolio of investments in the capital market. It provides a direct connection between the saving efforts for old age and the pension obtained as a result of those efforts. It is in favour of poor workers by providing a state-guaranteed minimum pension. This does not involve a regressive tax on labour and is financed by general tax revenues. (Under the pay-as-you-go system, poor starts to

work in his/her early ages, makes contribution for longer period and receives benefit for a shorter period). In the proposed system, the longer period of contribution results in a better pension. The system is flexible in the sense that the workers can stay in the present pay-as-you-go system and receive the benefits or they can transfer into the new system, if they are under a specified age. The workers who transfer to the new system will receive a bond from the government. The government guarantees to pay this bond when the workers reach the retirement age or in case of disability. Therefore, a transferring worker will receive benefits from the government and from the private saving account, when he/she is retired.

The new system starts with a primary source of financing which is acquired by the state. This is called "bridge debt" based on the market interest rate. The second source is a transition tax which replaces part of the existing payroll tax. It is assumed that the new system will generate a significant fiscal surplus in the medium and long run. Transition tax will be abolished and bridge debt will be paid back. Abolishment of transition tax would have a positive impact on employment.

The possibility of a bankruptcy in private saving account system is a low one. The new system has an automatic adjustment mechanism to changing conditions. Pay-as-you- go system, in general, does not have this flexibility. Indeed, one of the structural shortcomings of the pay-as-you- go system hindered the relationship between its promises for a certain level of benefits and variables which a government cannot control, such as birth rates and life expectancy of the population. Should these uncontrollable variables change in a certain way, which are taking place in the developed countries in the form of population ageing and in the developing countries in different forms, governments can not fulfill their promises and have to reduce the promised benefits. The bankruptcy of an administrative company does not harm the workers' savings in the private saving account system. Because, savings are in a pension fund that are put into a legal and financial entity separate from the administrative company. On the other hand, the system is supervised by the government with utmost technical capacity and autonomy. The regulations set by the government are strictly controlled.

At the end of working life of a worker, firstly, the pension is subject to a state-guaranteed minimum level and there are two possibilities for the worker: the worker may either choose to leave the total saving to the company which has administered his/her accounts for years and demand

monthly withdrawals or may transform the capital into a life annuity with a life insurance company.

Therefore, the private saving account system is superior to pay-as-you-go system and its advantages may be summarized as follows:

a) It increases pensions.
b) It increases employment. The new system is financed by the compulsory savings of the workers, which at their own do not represent a tax. These compulsory savings may be lower than the payroll tax required by the pay-as-you-go system. Therefore, the payroll tax may generate a distortion in the labour market and the new system can eliminate this distortion.
c) It increases savings. The workers must have a minimum rate of savings and there are incentives for additional savings. All together, the net result is an increase in national savings.
d) It increases capital productivity, and therefore, increases GDP growth rate.
e) On the one hand, it reduces the state intervention into the economy, on the other hand, it depoliticizes the pension system.

There are some shortcomings of the system as can be seen in Chile. The cost of operating the system is high. This is due to low level of automation, and high advertisement costs.

Some private firms do not want to insure women or they are asked to prove that they are not pregnant. Although, 9 out of 10 workers are in the system, those who pay regular premiums have declined from 76 percent in 1983 to 57 percent in 1994.

There is a possibility and necessity for a gradual transformation from pay-as-you-go system to private saving account system. Indeed, the new system is not aimed at capitalizing the existing system. The system is based on voluntary transformation of workers who are below a certain age to the new system. The new workers who enter the workforce are obliged to begin with the new system. As mentioned above, workers who voluntarily transfer to the new system will receive a bond which will compensate them in the future. Those who do not want to transform and existing pensioners will remain in the pay-as-you-go system.

IV. A Proposal for Turkey

The proposal has no claim on a complete conversion of the existing system into a new private saving account system. On the contrary, it is going to be investigate the possibilities of a private saving accounting system. It

is going to be argued that, given the income distribution, it will be difficult to adopt the private system. However, there exists a place for some private initiative.

International Labour Organization has prepared a report for Turkey in 1996. Its assumptions are based on 1995 prices. The following analysis is based on these assumptions:

a) After a 10 year transition period, pension payments will be raised to age of 60 for men(initially 55) and 58 for women (initially 53).
b) Premium rates of 21.5 percent for the SSK, 20 percent for the Bağ-kur and 35 percent for the Emekli Sandığı will not be raised.
c) Social Aid will be parallel (increase or decrease) to social security premiums which are calculated
d) The annual real rate of growth of GDP is assumed as 5.9 percent between 1995 and 2005, 4 percent between 2006 and 2025, and 3 percent between 2026 and 2050.
e) The annual rate of growth of employment is assumed as 1.3 percent annually until 2005,
f) The annual rate of inflation, measured by consumer price index, will be 5 percent after year 2000.
g) The annual real wage increase will be 5.7 percent until 2005, 3 percent between 2006 and 2025, and 2.5 percent between 2026 and 2050.
h) The real interest rate will decline until 2.6 percent until year 2000, and will remain at the level of 2.2 percent after year 2006.

It is obvious that the private saving account system represents some drawbacks for Turkey. ILO study stress that the workers between 30- 50 years, with insufficient asset accumulation will not join the new system. The TÜSİAD study points out that "mandatory savings of workers" should gradually be transferred to the new system. This savings would make a substantial contribution to the new system. Nevertheless, as the number of teachers, health personnel and security forces are taken into consideration, Emekli Sandığı is expected to continue for a foreseen future: According to the TÜSİAD study, the number of public employees will increase from 1,950,000 in 1997 to 2.9-3.0 million in 2050. According to ILO study, the same figures will rise from 4,6 million in 1996 to 17,4 million in 2050 for the SSK; and from 4 million to 15,1 million in 2050 for the Bağkur. Therefore, these three organizations, one way or another, should continue.

There is one more and important reason that should be taken into ac-

count. The income distribution in Turkey is one of the worst in the world and is getting even worse. This necessitates a kind of pension system for the poor who cannot afford to enter the private saving account system. According to the State Institute of Statistics (1994), should the population is divided into 5 groups, each group covering 12-13 million people will receive 54.9 percent, 19.0 percent, 12.6 percent, 8.6 percent and 4.9 percent from higher to lower, respectively. Taking into account the Turkish GDP is approximately US$ 200 billion, each group of 2-13 million people have a total income of US$ 110 billion, US$ 38 billion, US$ 25 billion, US$ 17 billion and US$ 10 billion respectively. Should we make projections into the future;

Table 5: Income Groups and Total Income (Billion US$)

Years	Population in Each Group	Group I	Group II	Group III	Group IV	Group V	Total GDP
2000	13 million	114,7	40,4	27,6	19,1	10,6	212,4
2005	14 million	152,6	53,7	36,7	24,4	14,1	282,5
2010	15 million	186,5	65,6	46,8	31,1	17,3	347,3
2020	17 million	275,1	96,8	66,3	45,9	25,5	509,6
2025	18 million						620,0
2030	19 million						720,0
2040	21 million						968,0
2050	24 million						1.340,0

Reference: Calculations are based on ILO Study with 1995 prices and 1 US$= 49261 TL.

It is being assumed that the income distribution will not change dramatically in the next 25 years. As the rate of growth of the population slows down and employment and income increase, it is expected that the savings, too, will increase. Moreover, people with low income will begin to save as their income increases.

ILO has prepared a similar report for Chile, Argentina, and Colombia and has assumed that a 2 percent of GDP would be transferred from social security funds to stock markets. Here, one should make an assumption about reducing the social security deficit in Turkey. Suppose that this deficit has demolished between 2000-2002. A similar situation was observed in France and a new tax called "social debt" in France, could be applied. Further assumptions are: i)The retirement age will be raised to 55-58 for women and 58-60 for men with a transition period of 5 to 10 years. ii) The

premium payment period will increase (for example to 7000 days). iii) the system will distribute to pensioners the premium it collects, while private saving account premiums would be transferred to the stock market.
The size of the Turkish Social Security system has reached US$ 20 billion and the volume that would be transferred to the stock market is calculated according to the ILO assumption as follows:

Tablo 6: Expected Transfers from Social Security System to the Stock Market (1995 Prices)

Years	Trillion TL	Billion US $
2000	210	4,25
2005	278	5,65
2010	340	6,91
2015	414	8,40
2020	504	10,22
2025	613	12,44
2030	710	14,41
2040	1.000	20,00
2050	1.313	27,00

(Calculated on the basis of ILO assumptions).

The income distribution figures clearly reveals that there is little room for the most income groups to be included in the new system. The GDP per capita were calculated as US$ 3,200, 4,000, 4600, and 6,000 for 2000, 2005, 2010, and 2020, respectively. Only the first income group is significantly above the national averages (US$ 8,800 in 2000, and US$ 16,200 in 2020). The second income group is slightly below the national average (US$ 3100 in 2000, and US$ 5,700 in 2020). The third group starts with US$ 2120 in 2000, and reaches to US$ 3,900 in 2020. The fourth group, on the other hand, reveals US$ 1460 in 2000, and US$ 2,700 in 2020. The last group begins with below US$ 1,000 in 2000, and reaches US$ 1,5000 in 2020. Since more detailed information is not available on income distribution (for example the population divided into 20 groups, each including 5 percent of the population rather than 5 groups each including 20 percent groups) one should accept the figures given in Table 7.

TABLE 7: GDP per Capita for Each Income Group Between 2000- 2020 (US$)

	Group I	Group II	Group III	Group IV	Group V	Average
2000	8,800	3,100	2,120	1,450	815	3,275
2005	10,900	3,850	2,620	1,750	1,000	4,000
2010	12,450	4,375	3,120	2,075	1,150	4,650
2020	16,200	5,700	3,900	2,700	1,500	6,000

Whereas the mandatory system will provide a premium of 10 percent of the GDP, this ratio will be expected to decline to 5 percent of the GDP in 2020. The new system, on the other hand, will provide a premium of 12 percent of the GDP in 2000, and this ratio will decline to 7 percent in 2020. It is said that the size of the Turkish stock market is around US$ 50 billion as of end-1997. The pension fund stream is a continuous and quite a stable fund stream which would be invested in the stock market system not only in shares, but also in Treasury bonds and in real estate market. Since the pension funds are accepted as institutional investments, the effect of this stream on the stock market is subject to another research. One should pay attention to the fact that the above figures are based on minimum levels, because the employment is expected to increase to 12.2 million in 2000, million in 2005, 17.3 million in 2010, 21 million in 2020, 25 million in 2030, 30 million in 2040 and 35 million in 2050.

Recently, the size of the whole Turkish insurance market is around US$ 2 billion and half of this amount is accident insurance. Only a portion of 25 percent is for life and health insurance. Only seven insurance firms are listed on the Istanbul Stock Exchange. It is estimated that the total pension funds are around US$ 800 million. This small amount reveals that even the top income groups are not interested in pension funds. The size of life and health insurance per person is US$ 8-10, which is expected to increase 10 times should the new system is operated. In the near future, should the mandatory premiums come to the stock market this figure would reach US$ 400. The critical questions here are: Do private pension and its contribution to the stock markets system take into consideration the human side and the retired people side of the subject? and Are the Turkish private life insurance companies ready for the new system in which huge amounts of funds would channel into?

Further research topics, under a two-pillar system, should be outlined as;

a) the effect on increase in pensions,
b) the effect on employment,
c) the effect on savings and stock markets,
d) the effect on capital productivity and gdp growth rate,
e) whether the state intervention in the economy is reduced after private pension system is introduced.

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THE IMPACT OF TAX REGIMES ON THE DEVELOPMENT OF PRIVATE PENSION FUNDS: REFLECTIONS OF THE CAPITAL MARKET

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Abstract

Private pension funds have been major institutional investors in most countries of the Western hemisphere. The countries providing fiscal incentives and tax shelter to pension savings are also those having large pension fund assets in the economy. In these countries, privately managed, fully or partially funded pension funds play a market-maker role in the capital market, take place in the demand side of the privatization process, help to the mobilization of workforce in business circles, and ease the burden of demographic change on the budget, in addition to their basic function of providing retirement benefits in old age. Taxation regime of retirement savings shapes the dimensions, functions, legal infrastructure and the investment areas of private pension funds. Taxation can also be a useful tool in the development of the domestic financial markets, the promotion of financial innovations and instruments, and establishment of fundamentals of market economy, where necessary.

This paper aims to show that inappropriate taxation of private pension savings will restrict not only the accumulation of funds but also the possible positive effects of those funds on the capital market, as well as other sections of the economy. It is also suggested in that, private pension funds can reach such scales sufficient to perform these expected functions, by providing tax exemption to contributions, tax-free environment to investment returns and by taxing only the benefits. Finally, countries suffering from improper functioning of a PAYG type social security system, and planning to design funded private pensions as a "voluntary" second pillar, should give ultimate priority to the taxation aspect of this reform.

I. Global Development of Private Pension Funds

As a result of the social security system's handicaps due to demographic

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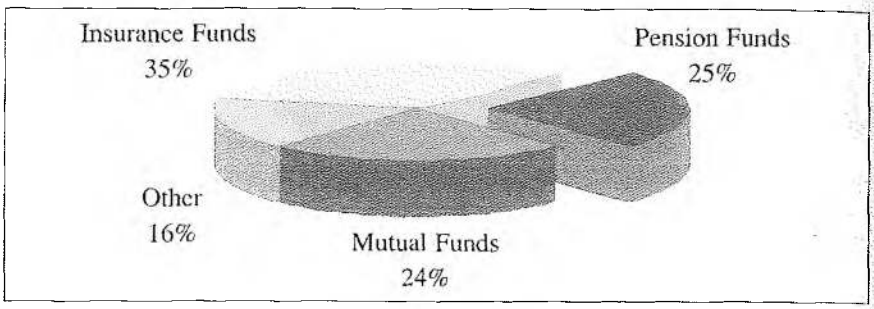
changes in societies, private pension funds have collected increasing amount of savings under their management, becoming one of the major institutional investors in the countries they give service. These funds, reaching US$ 8,7 trillion in assets as of 1996, are the second biggest institutional investor groups holding 25% of financial assets within the OECD region, after insurers.

Figure 1: The Distribution of Financial Assets by Institutional Investors in the OECD Region (1995)



Source: OECD, 1997.

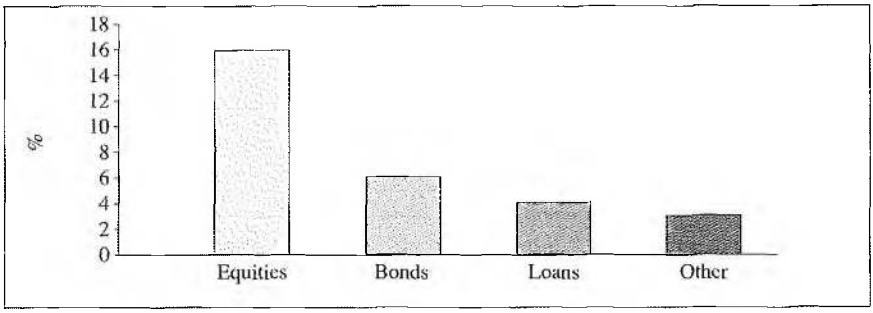
Clearly known future liabilities and usage of insurance products for members makes pension funds a brilliant fund management institution, minimizing the necessity of keeping aside cash for unexpected out-flows. The long-term structure of their liabilities and the large dimension of the assets they manage melt down the risk of any individual investment in highly volatile markets. Private pension funds known as "patient capital", focus in general on the return that will be received in long-term, instead of short-term. Although the investment strategy changes from fund to fund according to the profile of members, pension funds having younger members invest in long-term and comparatively aggressive instruments while funds that have an older member profile give priority to the fixed-income securities in their portfolios.

As a result of the tendency of pension funds to achieve a high return in the long-run equities and bonds cover the bulk of their investment portfolio. The low risk - high return opportunity in the long-term equity investments which are highly risky in short-term, overlaps with the strategies of these long-term investors.[1] A report, which explains key economical and financi-

[1] It should be emphasized that, equities have a large share also in the offshore investments of pension funds as well as domestic market portfolios. This argument is especially true for the countries such as the United Kingdom, the Netherlands, Switzerland and Australia, where private pension funds invest heavily in international securities compared to bonds and real estate [Coote, pp.2-7].

al issues for the aging societies of OECD countries, indicates that shares of equities in the portfolio of pension funds was 79,3% in the United Kingdom, 57,6% in the USA and 41,1% in Belgium as of 1996 [OECD, 1998]. While pension funds' investments in equities vary widely according to the development and efficiency level of capital markets, related legal framework, and proficiency of portfolio managers in risk management, the annual growth rate of equities reaching 16% surpassed the growth rates of other assets, including bonds between 1990 and 1995 in the OECD region.

Figure 2: Annual Average Growth Rate of Equities in the OECD Region (1990-1995)



Source: OECD, 1997.

On the other hand, although it is not a "must" for pension funds to invest in bonds according to national legislation, bonds take a large stake in the pension fund portfolio where and when return of fixed-income securities are high in real terms. Davis points out that it is very beneficial for the pension funds to invest in domestic bonds in Germany and the Netherlands, where these securities have high returns [Davis, 1993]. Indeed, in light of the latest OECD data, assets invested in bonds in the pension portfolio was 77,8% in Germany, 58,5% in Sweden, 53,3% in Switzerland, 52,6 % in Japan and 50,1% in the Netherlands as of 1996.

Once they grow up, pension assets can execute numerous externalities. Nevertheless, I will not emphasize the complex relationship between these funds and the national savings and economic growth[2]. I will also not

[2] Some empirical studies conducted by Vittas, Demirgüç-Kunt and Levine (1996) have stated that the development of private pension funds and the stock market may not be parallel all the time. In countries, where there are portfolio restrictions for private pension funds and in developing markets, where foreign institutional investors become dominant in the stock market due to given privileges, the correlation between the increase in pension funds as percent of GDP and the stock exchange index may turn out to be negative.

mention, under which circumstances pension funds can decrease market volatility, how much they contribute to the development of financial innovations, how they play role in the promotion of derivative markets by using hedging mechanisms, and (though rarely reflected in practice) how appropriate venture capital instruments are for pension funds. Also, I do not want to express how successfully pension funds increase the level of the quality in portfolio management, research and development, consultant and safekeeping services in the finance sector. The only thing that I would like to emphasize here is, if we do not set out appropriate conditions for the development of retirement savings, pension funds may never be able to fulfill the functions that we expect to see in the capital market and in the overall economy. In other words, in order to guarantee the positive impacts of pension funds on the economy and the capital market, priority should be given to enable these funds to manage assets big enough to make any effect on the markets.

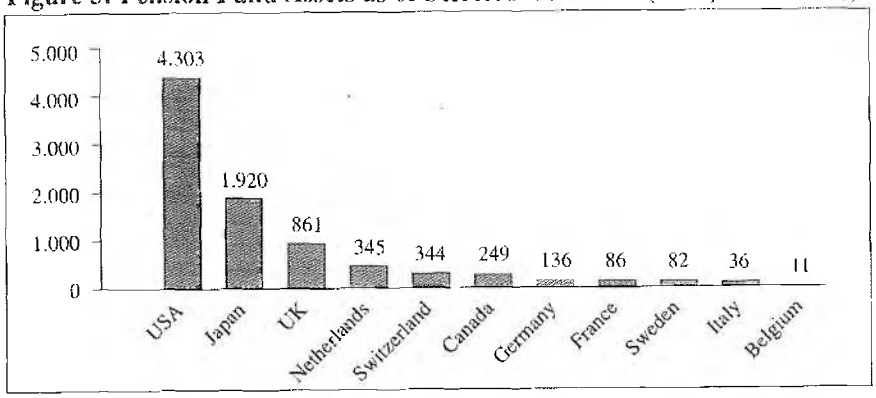
At this point, I consider it necessary to analyze the results received in successful countries, which may be an example for Turkey in this area at the stage of designing her own private pension funds as a "voluntary" second pillar. The word "voluntary" is extremely important, because there will be no need to tax incentives if private pensions are mandatory. Keeping this point in mind, when we take a short glance at the global results, we find that 94% of total pension fund assets are concentrated in the hands of only 7 countries. (Only one country, the USA, holds a massive part of the global assets.)

When we consider the private pension assets to the national GDPs, Switzerland has pension assets as big as 117% of her GDP while the Netherlands has 87%, the United Kingdom 75% and the USA 58%.

If we take into consideration the development of pension fund assets in the 25 years period between 1970 and 1995, we find that the largest increases occurred in Great Britain and Denmark, with 330% and 320% respectively [Davis, 1995; OECD 1998].

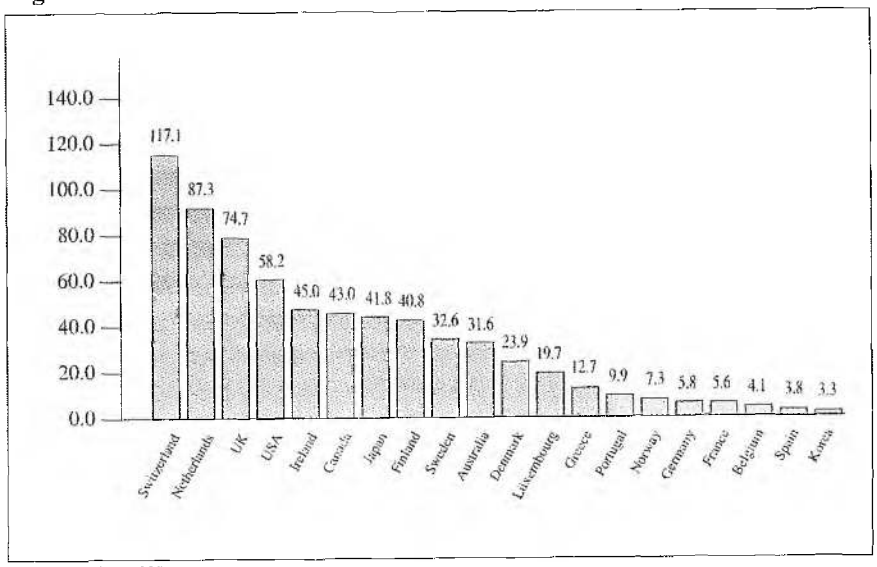
It is obvious that, high returns of prudent man type decentralized liberal fund management plays an important role in countries like the USA, the United Kingdom and the Netherlands in comparison to Germany, France, Italy and Belgium. Meanwhile, people in the United Kingdom, the Netherlands, the USA and Canada save a larger part of their total accumulations in pension schemes than people in Germany and Japan. This concentration in household savings should force us to search for other reasons

Figure 3: Pension Fund Assets as of Selected Countries (1996, billion US$)



Source: OECD, 1998.

Figure 4: Pension Fund Assets as of GDP (1996)



Source: OECD, 1998.

for better development of pension funds in some countries, besides the impact of efficient environment of prudent man type fund management.

Table 1: Share of Pension Savings in Household Savings (1991)

	Share in Household Savings
UK	27 %
Netherlands	26 %
USA	22 %
Canada	17 %
Germany	3 %
Japan	2 %

Source: Davis, 1993.

When we analyze the legal environment of those countries in which pension funds take a large part in both the overall economy and the household savings, and the countries where pension funds have not developed sufficiently, we find that tax regimes concerning pension funds make a great difference. Indeed, tax regulations have the power of channeling the savings into desired areas, shaping the characteristics of pension systems, legal infrastructure and investment instruments, as well as determining the magnitude of these funds. Thus, aiming to increase long-term savings, to replace public savings with private savings, and to guarantee the well-being of long-term savings by keeping them in strictly supervised and licensed institutions, some countries provide fiscal incentives in order to channel savings to private pension funds.

II. Taxation Options Regarding Private Pension Funds

There are three methods of taxing the pension savings:

- Contributions of employers and/or employees to pension funds
- Investment incomes of pension funds
- Retirement benefits paid by pension funds

Public authorities tax one or more of these areas where these funds give service. Annex 1 provides detailed information for each of these three policy options. Taxation policies regarding private pension savings in selected countries can be seen in Table 2.

Table 2: Current Tax Regime of Pension Funds in Selected Countries

	Status of Contributions	Status of Investment Returns	Status of Benefits
Australia	Taxation	Taxation	Taxation
Canada*	Exemption	Exemption	Taxation
Denmark	Exemption	Taxation	Taxation
France*	Exemption	Exemption	Taxation
Germany	Taxation	Exemption	Taxation
Italy*	Exemption	Exemption	Taxation
Japan	Exemption	Taxation	Taxation
Netherlands*	Exemption	Exemption	Taxation
New Zelland	Taxation	Taxation	Exemption
Sweden	Exemption	Taxation	Taxation
Switzerland*	Exemption	Exemption	Taxation
UK*	Exemption	Exemption	Taxation
USA*	Exemption	Exemption	Taxation

Source: Davis, 1995. (*) Countries which provide tax incentives to private pension funds.

As seen in the table, policies providing tax exemption to contributions and investment incomes while taxing retirement benefits are the most common ones among the reviewed countries. The countries that choose this policy are also those which have the largest pension assets in the economy. As of 1996, these countries cover 92% of global pension assets except those belonging to Japan, where pension fund data massively includes retirement savings in life insurance companies and trust funds.

Countries providing tax incentives generally follow the mentality of keeping savings tax exempt while taxing expenditures. When they act according to this mentality, they do not tax the saved pension fund contributions and investment incomes of pension funds. On the other hand, the countries where funded pension liabilities do not show any remarkable presence generally do tax savings as well as expenditures and/or do tax all kind of income in different combinations.[3]

From the point of view of individuals, it is preferable to pay the tax of pension savings at the retirement period where marginal tax levels are generally lower than the working years. This way, individuals pay the tax of

[3] As an example, in Australia, where pension savings are taxed at every stage, the premiums paid by employers on behalf of employees are taxed by 15%, whereas the premium payments of employees are taxed according to marginal tax rates. The investment returns are taxed 15% in real terms and the retirement incomes are taxed at 15% to a certain level and after that level, at the marginal tax rates.

some part of their working period in retirement years through a "tax deferral", while they benefit from lower rates compared to their high tax rates in working years. In addition, a tax-free environment enables pension savings to grow with compound tax-free returns.[4] Thus, providing tax exemption to retirement savings creates a tax arbitrage opportunity in favor of pension funds [Fuller, 1987]. As a result of tax incentives to pension funds, retirement savings become an important part of household savings particularly of middle-income groups in the mentioned countries [Francis, 1993; Daykin, 1995].

From the point of view of the state, on the other side, the taxable amount grows with compound tax-free returns until retirement period. Thus, while private pension funds decrease the burden of their members on the society at old ages, public incomes become higher and higher year after year [Ippolito, 1993]. In addition to this, it will also be more beneficial for the well being of the State budget in the long term, to tax any taxable activity in the retirement period, when public expenditures on social security and health areas tend to increase. In this way, during times of increasing proportion of retired people in the society due to demographic change, the blast in the public expenditures can much more easily be covered by the taxes from the retirement benefits of this growing group. Otherwise, it would not be possible to cope with increasing costs of an aging society via rationally limited taxes of a comparatively small working population.

At this point, we need to mention that the maximization of the pension fund assets in a secure environment is to the benefit of the fiscal authority in the long run because of the enlargement of tax base in parallel to the growth of pension assets. In order to prevent any misuse of tax privileges regarding the pension savings, states establish tight inspection mechanisms and follow closely the funding level of the funds. The state, the "sleeping partner", demonstrates great care in supervising these funds in order to prevent any misuse and defect that can threaten its interest in the retirement savings [Capital Taxes Group, 1989]. Consequently, tax privileges for pension funds increase the common interests of employees and the

[4] This causes firms with high tax liabilities to over-fund the pension saving accounts of employees in order to make use of tax advantages. Studies dealing with the relation between corporate tax rate and the over or under-funding of employer-funded retirement schemes have made two contradictory statements. According to Myers and Majluf, employers tend to fund retirement schemes instead of paying taxes as their marginal tax rate increases. On the other hand, Francis and Reiter state that, the high tax rate for firms are a result of high profits, so, it is not preferable for them to over-fund retirement schemes instead of investing in their own activity. Research on this subject justifies both views.

state, compared to a system in which the state taxes savings at the origin.

III. Potential Negative Aspects of Tax Privileges

On the other hand, it should be noted that tax privileges for private pension plans can bring some undesired consequences in the middle or long term, mainly due to an improper design of the system.

- First of all, private pension funds do not always have a positive impact on the level of national saving. People generally decrease their other savings in taxable areas with the purpose of using maximum tax-free investment opportunities that pension funds provide. Hence, national saving does not increase as much as pension assets. In addition to this, decreasing social security premiums lower public savings and create a suppressive effect on national savings [Franco, 1996; Munnell, 1992].
- If they are not compulsory, private pension funds generally provide a tax-free investment shelter for upper-middle and high-income groups, more than low-income groups. If high-income groups, which are in a better condition to invest in these funds, (up to the maximum limits), benefit more than low-income groups in the society, an adverse effect occurs in the functioning of tax privileges [Munnell, 1992].
- Regarding capital markets, the long-term position of pension funds can cause a decrease in the private (taxable) long-term investments of individuals in the markets or, private pension funds can focus on short-term investments, instead of acting with long-term considerations, thus violating the main aim of tax incentives [Franco, 1996].

However, it should be noted that both the positive and negative impacts of taxation regimes of pension funds arise as a result of the design of the pension system.

IV. Summary

Private pension funds have been major institutional investors in most countries in the Western hemisphere. The countries providing fiscal incentives and tax shelter to pension savings are also those having large pension fund assets in the economy. In these countries, privately managed, fully or partially funded pension funds play a market-maker role in the capital market, take place in the demand side of the privatization process, help to the mobilization of workforce in business, and ease the burden of demographic change on the budget, besides their basic function of providing retirement benefits in old age. The taxation regime of retirement savings

shapes the dimensions, functions, legal infrastructure and the investment areas of private pension funds. Taxation can also be a useful tool in the development of the domestic financial markets, the promotion of financial innovations and instruments, and the establishment of fundamentals of market economy, where necessary.

This paper aims to show that inappropriate taxation of private pension savings will restrict not only the accumulation of funds but also the possible positive effects of those funds on the capital market, as well as other sectors of the economy. It is also suggested that private pension funds can reach such scales sufficient to perform these desired externalities by providing tax exemption to contributions, tax-free environment to investment returns and by taxing only the benefits. Finally, countries suffering from improper functioning of a PAYG type social security system, and planning to design funded private pensions as a "voluntary" second pillar, should give ultimate priority to the taxation aspect of this reform.

Annex 1: Taxation Options of Private Pension Funds

If we consider three areas as three stages where taxation can take place, policy options for taxation or tax exemption may be as follows:

1. The stage where contributions are paid (First Stage)

In case of tax exemption of savings directed to private pension funds, those savings are exempt from tax to a certain limit. In this case, retirement savings are transferred according to pre-tax incomes or are transferred according to post-tax incomes and are deducted from the tax base afterwards. While limits of tax exemption differ from one country to another, it is possible for employees to save beyond the maximum limit with the condition that it is taxed.

In case of taxation of contributions directed to private pension funds, the contributions are paid according to post-tax income. If the pension fund premiums are paid by employers, these payments are regarded as expenditures and are deducted from taxes. This approach, that does not differentiate between savings and expenditures, provides retirement savings to be realized through income and taxes them according to marginal income tax.

2. The realization of pension fund asset investment return (Second Stage)

Another stage where pension funds can be taxed, is the stage of earning

returns such as capital earnings, dividends and interest from investments. This kind of taxation is usually typical in countries where the major incentive is to tax all kinds of income. In addition, in inflationary environments, investment returns should be taxed according to real earnings instead of nominal earnings. Otherwise, if inflation accounting techniques are not used, the income tax regime may cause private pension funds to erode. At this point, it should be mentioned that, the way in which investment returns are taxed determines the asset groups to which pension funds will invest. For example, pension funds invest in securities providing high capital earnings when capital earnings are indexed to inflation but interest and dividend earnings are not. On the other hand, the issue of taxing unrealized investment returns is a problematic one in countries where investment returns are taxed.

In other countries where pension fund investment returns are not taxed, it is aimed to make these funds grow in a tax-free environment. However, there may be exclusions to tax exemptions. For example, in Switzerland where investment returns are tax exempt, earnings from real estate investments are excluded from this exemption.

3. The stage of using pension fund savings in retirement period (Stage Three)

The final stage where retirement savings can be taxed is by taxing benefit payments made to retired people. In some countries, all payments, whether they are annuities or lump sums, are taxed under the same conditions, while in others the conditions may be different. In those latter countries, the most common method of taxation is to make it less attractive for members to withdraw their savings in the form of lump sums.

While some countries strictly forbid lump-sum withdrawal of retirement savings, in others this may be possible. In case of taxation of premiums or investment returns in the first or second stages, this retirement benefit may be exempt from tax. In countries where retirement benefits are taxed, lump sums will naturally be subject to taxation. But, it is observed that, lump sums are generally spent for short-term needs, although the objective of retirement savings is to finance the old age period. For this reason, there is an increasing tendency to tax lump sums with higher rates.

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GLOBAL CAPITAL MARKETS

The third quarter of 1998 has been a period in which the effects of the South East Asian Crisis that broke out last year, were strongly felt. Although the Russian government declared that a devaluation would not be considered, just after three days, the 33% devaluation of the Ruble against the Dollar and the moratorium, revealed the first signals of the Russian economy's downfall. While the ongoing political and economical instability in Russia continued to increase day after day, Latin American economies, Brazil in particular, the ninth or tenth biggest economy in the world, began to indicate signs of crisis as well. The poor performance of Brazil forced the IMF to prepare an urgent 30 billion dollar aid. Due to the Asian and Russian Crisis, the diminishing fund reserves of the IMF fell down to a level below 10 billion dollars- not only forcing the developing but also the developed countries to take new measures in order to minimize the adverse effects of the widening crisis. While the Japanese government imposed a set of new banking sector reforms, the United States began to examine the hedge funds closer, as one of the biggest investment banks of the country, The Long Term Capital Management, came to the edge of liquidation. One of the most important measures taken, was the decreasing of the overnight credit rates 25 basis point, twice in a short period of time, by the FED. Not only the developed markets' but also the stock markets' indices of emerging markets, most of which stood at their historical levels were quick to respond to these measures.

Financial markets in most major developed countries were also affected by the crisis, though not in the same way nor at the same extent as the markets in emerging economies. While the nominal long-term interest rates remained at relatively low levels, as a result of the net declines since year-end 1997, short-term interest rates have converged especially in EMU (Financial Market Trends, June 1998).

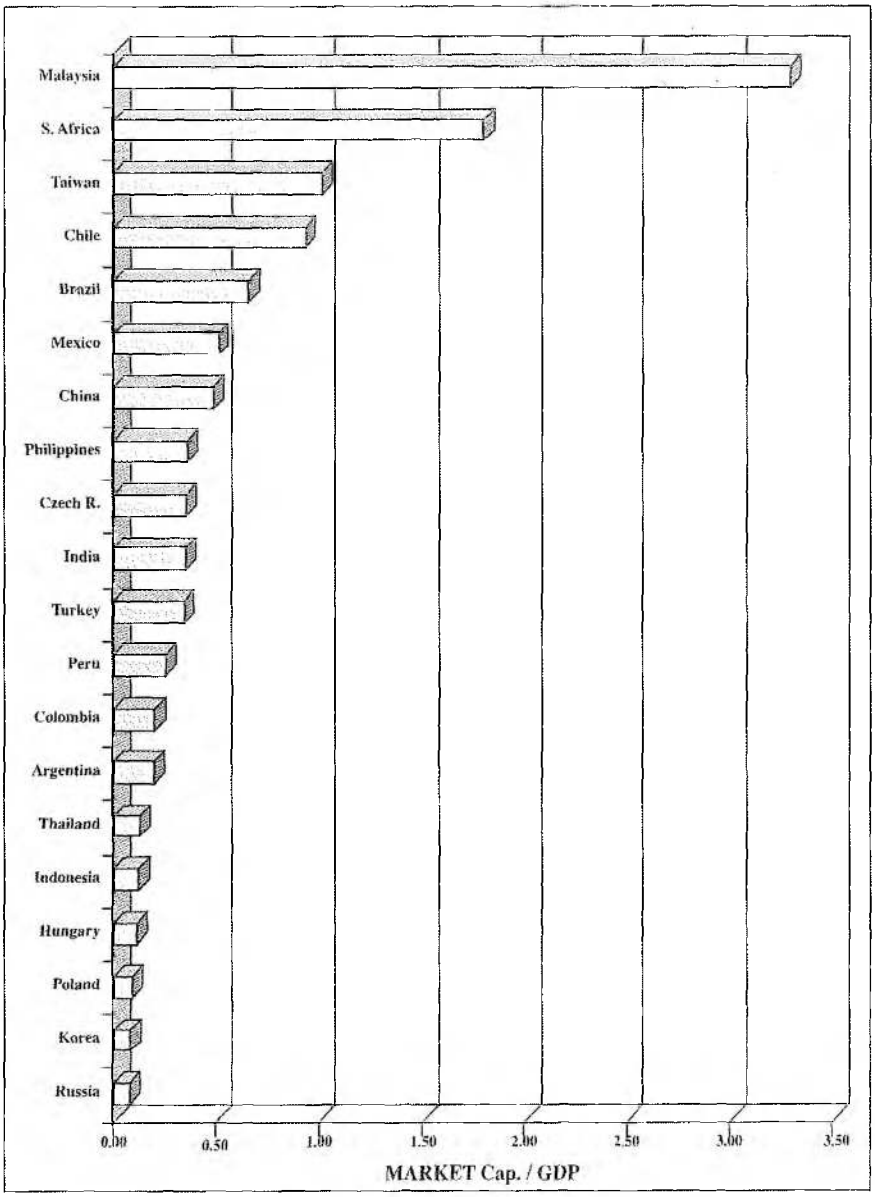
Due to the ongoing financial crisis, most of the emerging stock market indices have fallen piercingly in 1998. As of the end of September, up to the year-end the market capitalization including all stocks witnessed a 21% decrease. When observed on a regional basis, the decrease of the market capitalization was 39.2% in Latin America, 35.9% in Europe, 9.2% in Asia and finally 5.6% in the Middle East and Africa. In Russia, due to the crisis, the fall was more dramatic: a 59% drop in the index and

a 84.3% decline in market capitalization. Other dramatic declines in market capitalization, given respectively are; Venezuela -58.5%, Turkey -44.9%, Mexico -44.2%, Brazil -39%. Regionally, the emerging markets in Latin America and Europe experienced the crisis more intimately. Despite the low performance of the two European markets, Russia and Turkey, some other markets of the region performed very well. Greece and Portugal are two good examples of these, as the market capitalization in September was up by 60.5% and by 31.6% between September and end-1997, respectively.

The effects of the crisis were different in developed markets. Although the indices of the developed markets have also significantly fallen at times, the trend has been upward. S&P 500 index in early September was 35% upper than its level at end-1997 while the D-J. Industrial rose by 22% and Nikkei 225 dropped by 26%.

The performances of emerging markets with respect to P/E ratio in October indicated that the highest rates were in Greece (25.2) and Taiwan-China (22.1). Except these two countries, in almost all of the emerging markets the P/E ratio fell with respect to the end-1997 level. The most serious decreases in P/E ratio were observed in the stock markets' of Indonesia, Korea, Czech Rep., Thailand, Brazil and Turkey. The P/E ratio in these markets as of end-October were (-28.3), (-18.3), (-15.9), (-3.3), (6.8) and (7.0), respectively.

Emerging Stock Markets' Importance in the National Economy (1997)



Source : Emerging Markets Investor, Vol.4, No.3, March 1998, 49, 56.

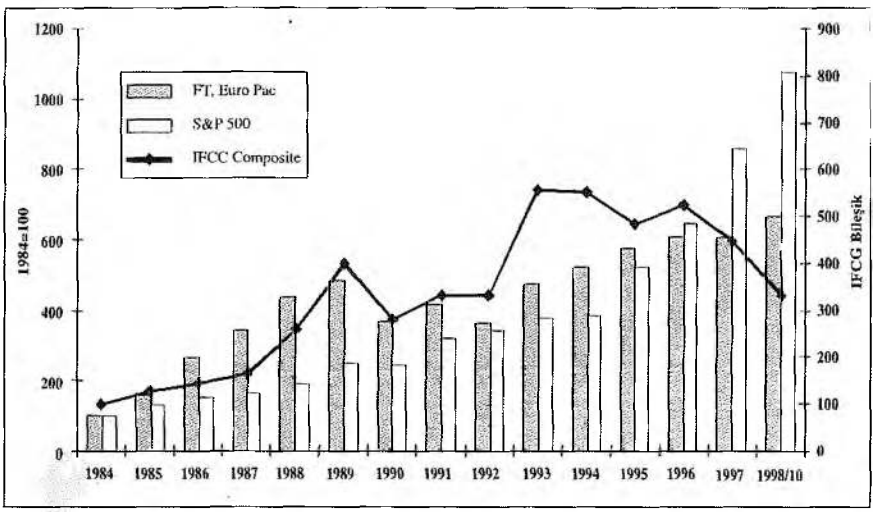
* : The capitalization of stock market as of December 1997 is the total market value of the listed and trading companies in the country's stock exchange or exchanges. GDP/GNP values are estimated by the adjustment of previous year GDP according to last years' growth rates.

Market Capitalization (USD Million, 1986-1998/10)

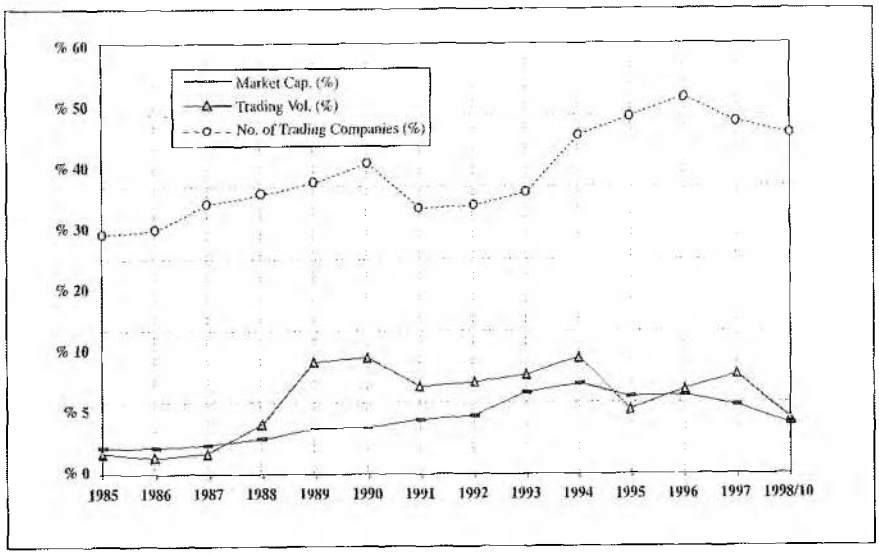
	Global	Developed Markets	Emerging Markets	ISE
1986	6,514,199	6,275,582	238,617	938
1987	7,830,778	7,511,072	319,706	3,125
1988	9,728,493	9,245,358	483,135	1,128
1989	11,713,683	10,975,622	738,061	6,756
1990	9,393,545	8,782,267	611,278	18,737
1991	11,290,494	10,435,686	854,808	15,564
1992	10,833,177	9,949,721	883,456	9,922
1993	13,963,831	12,377,034	1,586,797	37,824
1994	15,154,292	13,241,841	1,912,451	21,785
1995	17,787,883	15,892,174	1,895,709	20,782
1996	20,158,845	17,932,888	2,225,957	30,792
1997	23.541.385	21.311.877	2.229.508	61.095
1998/10	25.517.367	23.751.900	1.765.467	30.585

Source: FIBV, Focus Monthly Statistics, January 1998; IFC Factbook 1998; IFC Monthly Review October 98.
Note: 1998/10 figures are taken from 50 countries' data in FIBV Focus October 1998.

Comparison of Markets' Indices (1984-98/10)

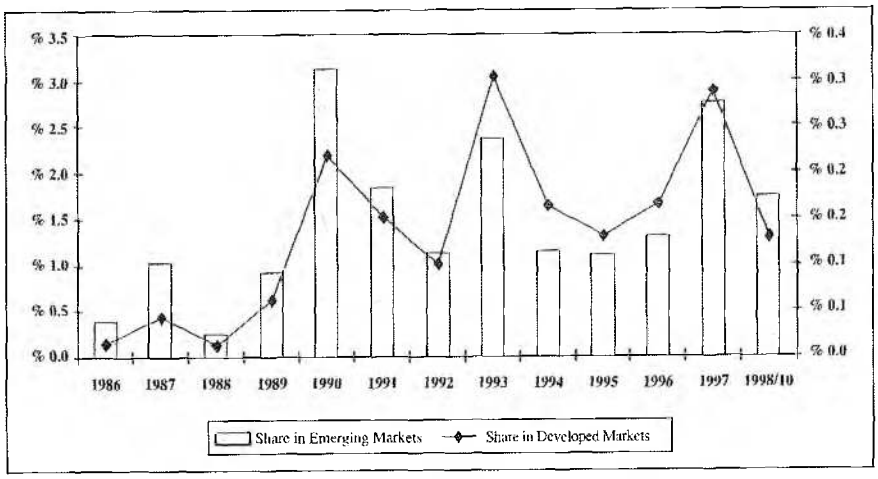


Worldwide Share of Emerging Capital Markets (1985-1998/10)



Source : IFC Factbook 1994-1998, 16-23; IFC Monthly Review, Nov. 1998; FIBV Focus Nov. 1998
Note : 1998/10 global total data are taken from 50 countries in FIBV, Focus, October 1998.

The ISE's Share in World Markets (1986-1998/10)



Source: IFC Factbooks, 1996-1998; IFC Monthly Review, November 1998.

Main Indicators of Capital Markets (October 1998)

	Market	Turnover Velocity (October 98)	Market	Value of Share Trading (millions, US$) Up to Year Total	Market	Market Cap. of Shares of Domestic Companies (millions, US$) (October 98)
1	NASDAQ	286.5%	NYSE	6,117,738.5	NYSE	9,520,443.5
2	Taiwan	245.4%	NASDAQ	4,423,202.4	Tokyo	2,221,195.4
3	Paris	239.2%	London	2,474,430.2	London	2,110,423.0
4	Korea	195.5%	Paris	1,715,059.8	NASDAQ	2,033,566.1
5	Madrid	179.6%	Germany	1,274,426.1	Osaka	1,719,289.2
6	Istanbul	143.1%	Taiwan	772,443.0	Germany	989,321.2
7	Germany	126.9%	Tokyo	628,123.7	Paris	894,717.3
8	Thailand	120.7%	Switzerland	589,545.8	Switzerland	644,441.2
9	Switzerland	99.4%	Madrid	535,478.5	Amsterdam	535,001.9
10	Italy	88.1%	Italy	420,774.2	Toronto	507,186.0
11	NYSE	81.9%	Amsterdam	341,834.7	Italy	479,343.3
12	Stockholm	81.6%	Toronto	282,320.0	Madrid	369,248.4
13	Singapore	79.7%	Stockholm	192,134.8	Hong Kong	345,085.0
14	Amsterdam	78.7%	Barcelona	180,080.4	Australian	304,050.2
15	Lisbon	72.7%	Hong Kong	177,055.4	Bilbao	298,497.4
16	Copenhagen	72.5%	Bilbao	172,102.5	Barcelona	297,397.4
17	Oslo	69.4%	Osaka	137,317.0	Taiwan	284,549.7
18	Irish	67.5%	Australian	133,905.9	Stockholm	262,255.8
19	Helsinki	64.8%	Korea	89,751.6	Brussels	215,757.9
20	Barcelona	62.3%	Istanbul	60,574.9	Johannesburg	191,070.4
21	Athens	61.8%	Copenhagen	54,237.5	Rio de Janerio	160,691.9
22	Toronto	60.0%	Brussels	50,906.3	Helsinki	108,075.9
23	Jakarta	55.9%	Johannesburg	49,560.7	Copenhagen	93,875.1
24	Hong Kong	54.1%	Singapore	45,221.9	Mexico	92,860.6
25	Bilbao	54.1%	Helsinki	44,589.0	Singapore	89,330.3
26	London	53.7%	Lisbon	41,015.3	Korea	67,873.7
27	Warsaw	51.7%	Athens	39,484.1	K.Lumpur	67,463.6
28	Australian	51.0%	Oslo	36,911.2	Irish	61,581.1
29	Vancouver	45.8%	Rio de Janerio	31,137.5	Lisbon	60,926.1
30	Vienna	45.0%	Irish	30,410.8	Athens	56,878.2
31	N.Zealand	43.6%	Mexico	27,860.6	Oslo	52,908.7
32	Tokyo	41.9%	Buenos Aires	22,806.4	Santiago	49,383.9
33	B.Aires	40.6%	K.Lumpur	22,734.1	Buenos Aires	46,766.4
34	Phillippine	33.1%	Vienna	15,402.5	Tel-Aviv	37,833.4
35	Johannesburg	31.0%	Thailand	14,633.3	Vienna	37,595.4
36	Tel-Aviv	30.8%	Tel-Aviv	12,402.5	Luxembourg	36,642.7
37	Mexico	29.3%	New Zealand	11,974.7	Thailand	31,461.9
38	Brussels	27.4%	Jakarta	8,973.1	Istanbul	30,585.8
39	K.Lumpur	22.9%	Phillippine	7,758.7	Phillippine	30,215.1
40	Lima	19.4%	Warsaw	7,432.2	New Zealand	22,521.0
41	Santiago	5.9%	Santiago	3,922.0	Jakarta	16,755.5
42	Luxembourg	3.9%	Lima	2,626.0	Tehran	14,991.9
43	Osaka	3.7%	Vancouver	2,189.7	Warsaw	12,961.1
44	Tehran	3.5%	Luxembourg	1,264.1	Lima	10,101.1
45	Rio de Janerio	1.9%	Tehran	805.8	Vancouver	4,246.9

Source: FIBV, Focus, October 98.

Trading Volume (USD billion, 1986-98/10)

	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	0.02
1989	7,468,215	6,302,687	1,165,528	773	15.61	0.07
1990	5,512,129	4,617,688	894,441	5,854	16.23	0.65
1991	5,016,379	4,410,855	605,524	8,502	12.07	1.42
1992	4,778,429	4,165,501	612,928	8,567	12.83	1.34
1993	7,702,502	6,633,684	1,068,818	21,770	13.88	2.17
1994	10,085,703	8,445,585	1,640,118	23,203	16.26	1.32
1995	11,666,260	10,632,763	1,033,497	52,357	8.86	4.97
1996	13,580,050	11,993,232	1,586,818	37,737	11.7	2.38
1997	19,484,706	16,782,995	2,701,711	58,104	13.9	2.15
1998/10	21,304,559	19,655,638	1,648,921	60,575	7.77	3.67

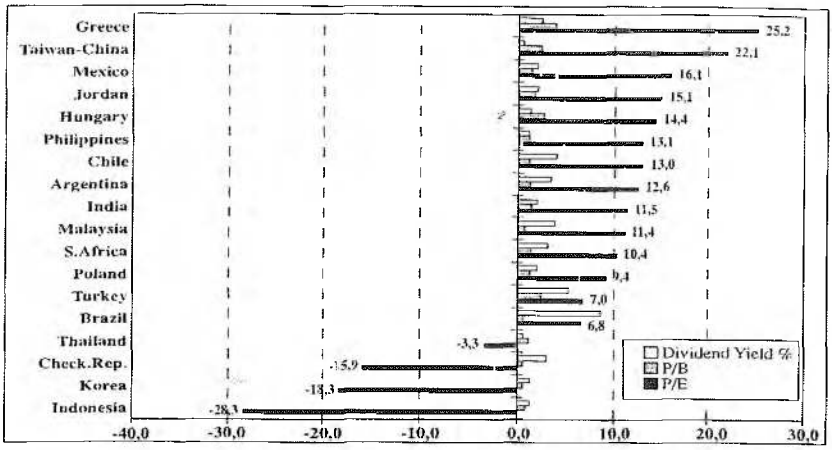
Source: IFC Factbooks 1997-1998; FIBV Focus Nov. 98.
Note: 1998/10 figures are taken from 50 countries in FIBV Focus Nov. 98.

Number of Trading Companies (1986-98/10)

	Global	Developed	Emerging	ISE	Emerging/ Global (%)	ISE/ Emerging (%)
1986	28,173	18,555	9,618	40	34.14	0.42
1987	29,278	18,265	11,013	50	37.62	0.45
1988	29,270	17,805	11,465	50	39.17	0.44
1989	29,486	17,478	12,008	50	40.72	0.42
1990	28,918	16,403	12,515	110	43.28	0.88
1991	25,951	16,315	9,636	134	37.13	1.39
1992	27,586	17,227	10,359	145	37.55	1.40
1993	28,768	17,431	11,337	152	39.41	1.34
1994	36,078	19,064	17,014	176	47.16	1.03
1995	38,864	19,467	19,397	205	49.91	1.06
1996	42,351	20,088	22,263	228	52.60	1.36
1997	40,593	20,656	19,937	258	49.1	1.29
1998/10	36,054	18,961	17,093	277	47.4	1.62

Source: IFC Factbooks 1997-1998; FIBV Focus Nov. 98.
Note: 1998/10 figures are taken from 50 countries in FIBV Focus Nov. 98.

Comparison of Markets' Performances (1998/10)



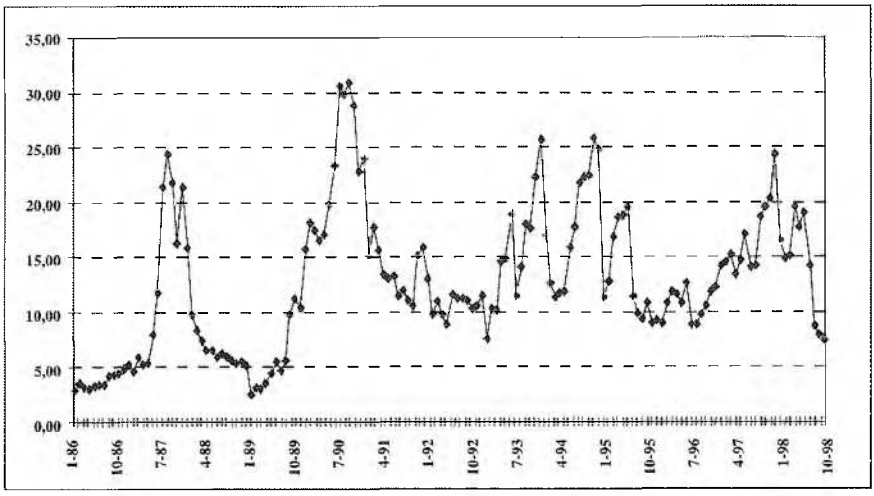
Source: IFC, Monthly Review, October 1998.
Notes: P/B= Market Value (price)/Book Value; P/E = Price/Earnings.
: Figures are taken from IFC Global Index Profile.

Price-Earnings Ratios in Emerging Markets (1993-1998/10)

	1993	1994	1995	1996	1997	1998/10
Greece	10.2	10.4	10.5	10.45	13.1	25.2
Taiwan,China	34.7	36.8	21.4	28.16	32.4	22.1
Mexico	19.4	17.1	28.4	16.79	22.2	16.1
Jordan	17.9	20.8	18.2	16.89	12.8	15.1
Hungary	52.4	-55.3	12	17.48	25.2	14.4
Philippines	38.8	30.8	19	19.99	12.5	13.1
Chile	20	21.4	17.1	27.76	15.9	13
Argentina	41.9	17.7	15	38.21	17.1	12.6
India	39.7	26.7	14.2	12.32	16.8	11.5
Malaysia	43.5	29	25.1	27.11	13.5	11.4
S.Africa	17.3	21.3	18.8	16.27	12.1	10.4
Poland	31.5	12.9	7	14.3	10.3	9.4
Turkey	36.3	31	8.4	10.74	18.9	7
Brazil	12.6	13.1	36.3	14.5	15.4	6.8
Thailand	27.5	21.2	21.7	13.06	4.8	-3.3
Czech Rep.	18.8	16.3	11.2	17.62	8.8	-15.9
Korea	25.1	34.5	19.8	11.69	11.6	-18.3
Indonesia	28.9	20.2	19.8	21.62	11.2	-28.3

Source: IFC Factbook 1996-1998, 129-233; IFC Monthly Review, October 1998.
Note : Figures are taken from IFC Global Index Profile.

ISE's Price-Earnings Ratio (1986-1998/10)



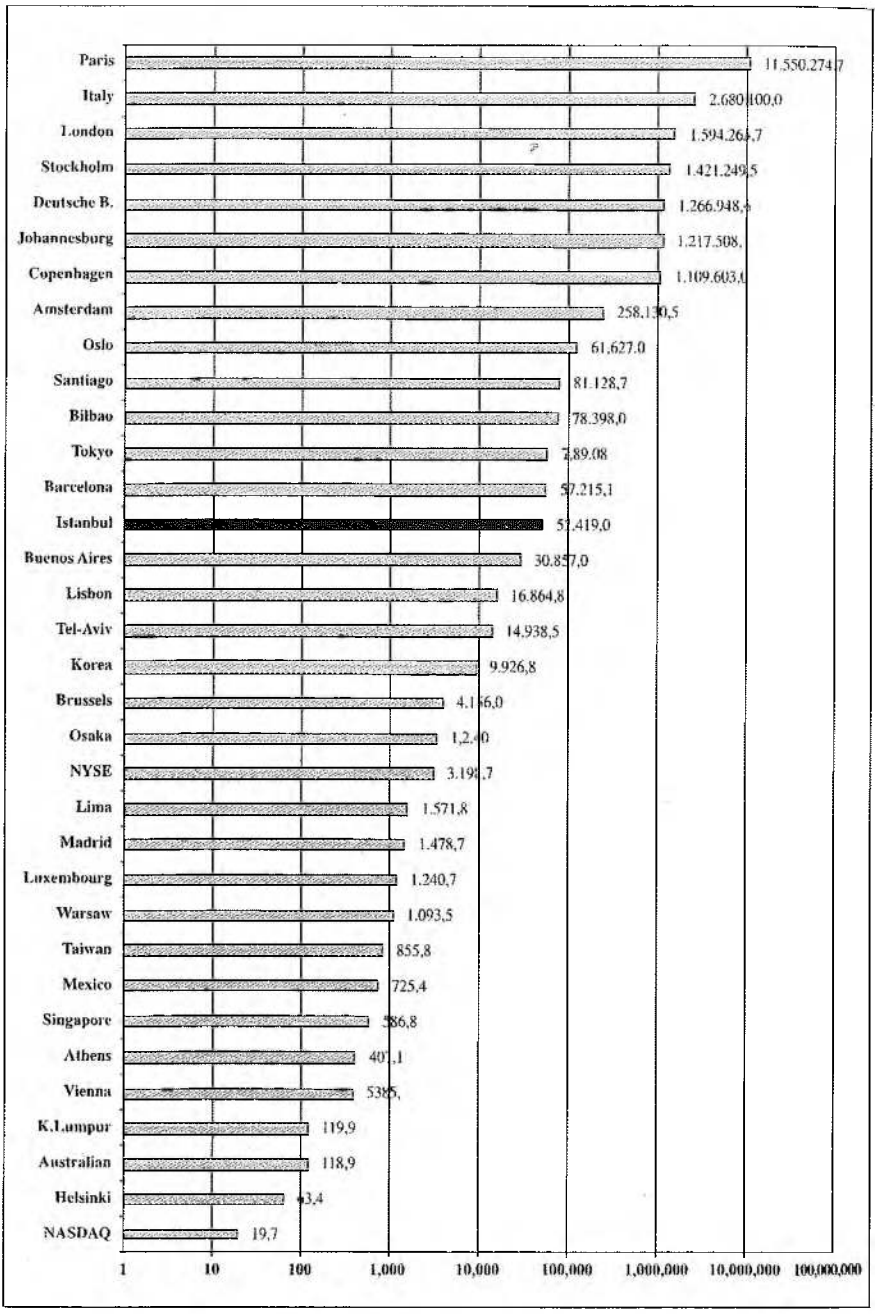
Source: ISE Monthly Bulletin, October 1998.

Market Value/Book Value Ratios (1993-1998/10)

	1993	1994	1995	1996	1997	1998/10
Greece	1.9	1.9	1.8	2.01	2.9	3.9
Hungary	1.6	1.7	1.2	1.97	3.7	2.8
Taiwan,China	3.9	4.4	2.7	3.31	3.8	2.5
Turkey	7.2	6.3	2.7	3.98	9.2	2.4
Jordan	2.0	1.7	1.9	1.71	1.6	1.7
India	4.9	4.2	2.3	2.07	2.7	1.6
S.Africa	1.8	2.6	2.5	2.34	1.9	1.6
Mexico	2.6	2.2	1.7	1.68	2.5	1.5
Poland	5.7	2.3	1.3	2.59	1.6	1.3
Argentina	1.9	1.4	1.3	1.62	1.8	1.3
Philippines	5.2	4.5	3.2	3.14	1.7	1.2
Chile	2.1	2.5	2.1	1.59	1.6	1.1
Thailand	4.7	3.7	3.3	1.78	0.8	1.1
Indonesia	3.1	2.4	2.3	2.66	1.5	1.0
Malaysia	5.4	3.8	3.3	3.78	1.8	0.9
Czech Rep.	1.3	1.0	0.9	0.89	0.8	0.7
Brazil	0.5	0.6	0.5	0.73	1.1	0.6
Korea	1.4	1.6	1.3	0.76	0.6	0.6

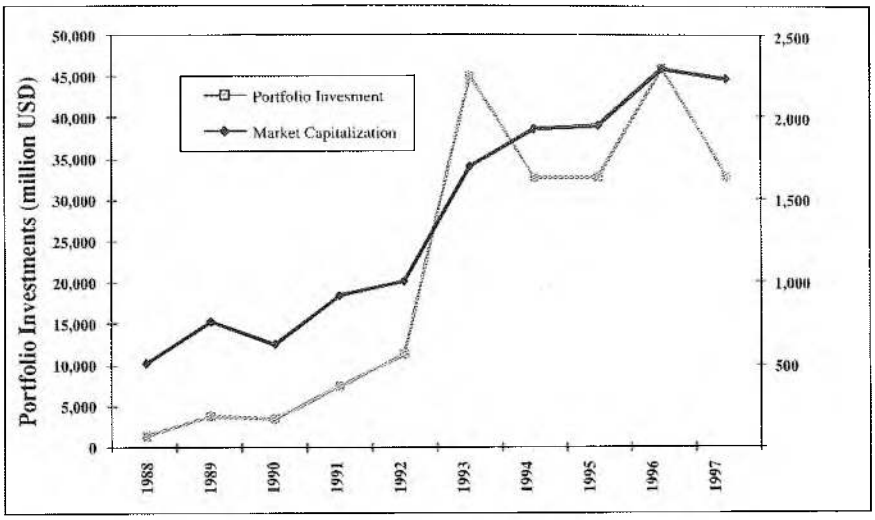
Source: IFC Factbook 1996-1998, pp.129-233; IFC Monthly Review, October 98.

Market Value of Bonds (Million USD, Jan-Oct 1998)



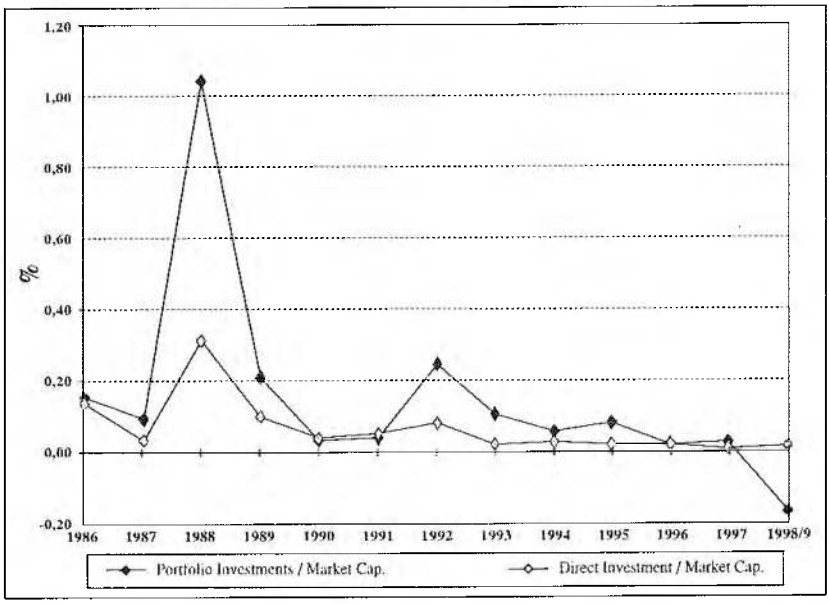
Source: FIBV, Focus, Monthly Statistics, October 1998.

Foreign Investments and Market Capitalization in Emerging Markets (1988-1997)



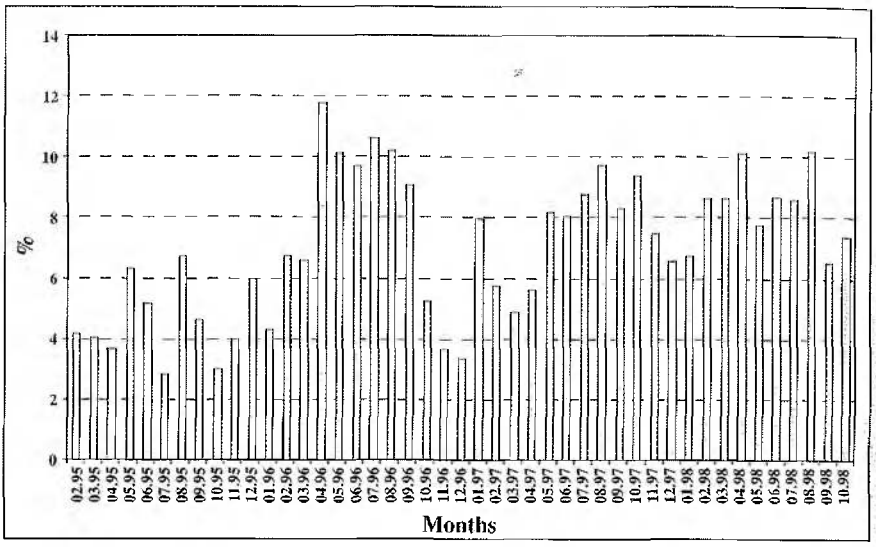
Source: IFC Factbook 1998, 6-23.

Foreign Investments as a Percentage of Market Capitalization in Turkey (1986-1998/9)



Source: ISE Data, CBTR Databank.

Foreigners Share in the Trading Volume of the ISE (Jan. 95- Oct. 1998)



Source: ISE, Data

Return Index Correlations of the ISE (Sep. 1993-Sep. 1998)

Notes: The correlation coefficient is between -1 and +1. If it is zero, for the given period, it is implied that there is no linear relation between two serious of returns. For monthly return index correlations (IFCG) see. IFC, Monthly Review, September 1998.

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ISE
Market Indicators

STOCK MARKET

	Number of Companies	Total Value				Market Value		Dividend Yield	P/E Ratios
		Total		Daily Average					
		(TL Billion)	(US$ Million)	(TL Billion)	(US$ Million)	(TL Billion)	(US$ Million)	(%)	
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	160	255.222	21.770	1.037	89	546.316	37.824	1,65	25,75
1994	176	650.864	23.203	2.573	92	836.118	21.785	2,78	24,83
1995	205	2.374.055	52.357	9.458	209	1.264.998	20.782	3,56	9,23
1996	228	3.031.185	37.737	12.272	153	3.275.038	30.797	2,87	12,15
1997	258	9.048.721	58.104	35.908	231	12.654.308	61.879	1,56	24,39
1998	277	16.962.428	66.904	75.389	297	10.374.768	34.485	3,45	8,65
1998/Q1	262	3.810.696	17.133	63.512	286	12.424.795	51.680	2,71	15,09
1998/Q2	271	6.002.655	23.856	103.494	411	16.265.640	61.442	2,14	19,03
1998/Q3	277	4.723.134	17.435	71.563	264	9.341.353	33.900	3,83	7,80
1998/Q4(*)	277	2.425.944	8.480	59.169	207	10.374.768	34.485	3,45	8,65

Q : Quarter

(*): The fourth quarter includes the October-November period.

Closing Values of the ISE Price Indices

TL Based

	NATIONAL-100 (Jan. 1986=1)	NATIONAL-INDUSTRIALS (Dec.31, 90=33)	NATIONAL-SERVICES (Dec.27, 96=1046)	NATIONAL-FINANCIALS (Dec. 31, 90=33)
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	1.045,91	914,47
1997	3.451,—	2.660,—	3.593,—	4.522,—
1998	2.577,54	1.904,87	3.583,56	3.241,29
1998/Q1	3.259,06	2.746,90	3.892,74	4.024,12
1998/Q2	4.100,00	3.503,84	4.967,07	4.957,42
1998/Q3	2.265,94	1.957,92	3.089,99	2.687,70
1998/Q4(*)	2.577,54	1.904,87	3.583,56	3.241,29

US $ Based

	NATIONAL-100 (Jan. 1986=100)	NATIONAL-INDUSTRIALS (Dec.31, 90=643)	NATIONAL-SERVICES (Dec.27, 96=572)	NATIONAL FINANCIALS (Dec. 31, 90=643)
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,—	500,40
1997	981,99	756,91	1.022,40	1.286,75
1998	498,55	368,44	693,14	626,94
1998/Q1	788,82	664,86	942,19	973,99
1998/Q2	901,23	770,19	1.091,82	1.089,70
1998/Q3	478,51	413,46	652,52	567,57
1998/Q4(*)	498,55	368,44	693,14	626,94

Q: Quarter (*): The fourth quarter figures are as of November 30, 1998.

BONDS AND BILLS MARKET

Traded Value

Outright Purchases and Sales Market

	Total		Daily Average	
	TL Billion	US$ Million	TL Billion	US$ Million
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	15.565.723	60.440	68.571	266
1998/Q1	3.186.680	14.154	52.241	232
1998/Q2	4.842.578	19.069	83.493	329
1998/Q3	4.541.395	16.780	68.809	254
1998/Q4(*)	2.995.070	10.437	71.311	248

Repo-Reverse Repo Market

	Total		Daily Average	
	TL Billion	US $ Million	TL Billion	US $ Million
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	87.308.471	339.635	384.619	1.496
1998/Q1	19.320.590	86.636	316.731	1.420
1998/Q2	20.689.218	81.921	356.711	1.412
1998/Q3	30.278.897	111.327	458.771	1.687
1998/Q4 (*)	17.019.766	59.752	405.233	1.423

Q: Quarter

(*): The fourth quarter includes the October-November 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	102,91	108,52	115,72	108,98
1998/Q1	103,53	111,16	122,77	112,03
1998/Q2	105,54	117,13	134,03	117,55
1998/Q3	104,23	110,67	115,30	112,21
1998/Q4 (*)	102,91	108,52	115,72	108,98

ISE GDS Performans 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	764,74	844,13	925,02
1998/Q1	523,70	571,24	646,15
1998/Q2	605,48	673,87	762,24
1998/Q3	685,90	755,45	827,84
1998/Q4 (*)	764,74	844,13	925,02
	US $ Based		
1996	122,84	132,99	144,74
1997	127,67	137,36	151,95
1998	150,40	166,01	181,92
1998/Q1	128,88	140,58	159,02
1998/Q2	135,33	150,61	170,36
1998/Q3	147,27	162,21	177,75
1998/Q4 (*)	150,40	166,01	181,92

Q : Quarter

(*): The fourth quarter figures are as of November 30, 1998.

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Book Reviews

Social Security in the 21st Century, Eds. Eric R. KINGSON, James H. SCHULZ, Oxford University Press, New York, 1997, pp. xxii+313.

Being related with the cultural issues as well as the economic structure, various social security systems are being applied in different countries. US social security program, which can be regarded as the most important social program that has been applied successfully for more than fifty years, needs to be restructured in the beginning of the new era.

"Social Security in the 21st Century", which has been edited by the United States' leading experts, namely Kingson and Schulz, provides the basic facts and an understanding of the various issues surrounding social security. It also discusses the reform of the system due to the rapidly changing working conditions and family structure.

The impetus for this book came from the *National Academy of Social Insurance*, which consists of social insurance experts who come from a variety of disciplines and professions including actuarial science, economics, health policy, history, law, and sociology. Each of the authors as recognized experts in the development of the nation's social insurance, private pension, and health financing systems, provide a wide range of views with regard to the definition of social security problem and preferred policy solutions. The book, generally focusing on the redistributive aspects of social security and the issues concerning its financing and economic effects, is divided into four parts which are composed of 18 articles.

The two articles in the first part present a short overview of the first section. Chapter 1 explains the rationale for government intervention in providing pension income and different forms of possible government interventions. This chapter attempts to lay out specific objectives of government intervention and evaluates the performance of each form in achieving those objectives. Chapter 2 reviews the history of social insurance in four distinct periods; the pre-1935 struggle for political legitimacy, 1935-50 fight for survival, 1951-72 period of expansion, and the post-1972 period of solutions of issues relating to cost.

The second part of the book contains eleven articles, which focus on the economic effects, affordability, impact on the federal budget, fairness to various groups, benefit adequacy, changes in disability policy and ge-

nerational equity. Chapters provide a wide range of views with regard to questions about social security and preferred policy solutions.

Chapter 3, written by the editors, reviews the debate about whether receipt of social security should be means-tested or continue to be paid regardless of income levels. Chapter 4, provides an answer to the question of whether benefits are too high or low within several contexts.

The questions of how the social security program actually works and how well it accomplishes the social objectives that have been set out for it, is answered in Chapter 5 by describing the relationship between OASDI (Old-Age, Survivors, and Disability Insurance Program) taxes paid and benefits received. A sizable literature on this subject is also given herewith.

The changes in work and family roles that have altered the patterns of economic dependency among family members are described in Chapter 6. This chapter also discusses reforms in the benefit structure of the "Social Insurance" program. The next chapter focuses on the provision of income for those protected within the scheme of the disability policy and on the issues about the disability policy reforms.

Both the social security and the private pension systems influence the retirement decisions of the older people and move the trend towards earlier retirement. The determinants of the timing of retirement are discussed in Chapter 8 by focusing on financial factors in both social security and private pension systems.

Considering individual incentives, capital accumulation, and the issue of competitiveness, the types of economic impact of social security on the economy are examined in Chapter 9. After an analysis of the implications of investing a portion of the Social Security Trust Funds in private securities, public attitudes juxtaposed with social security developments are reviewed in Chapter 11. A detailed analysis of survey findings about the public's knowledge of, support for, and confidence in social security, including a comparison of public confidence in social security, private pensions, and personal savings is also given in this chapter.

The question of whether America's older citizens receive too large a proportion of the share of the income, that the nation's social programs distribute, at the expense of the young has prompted a considerable amount of comment in the last decade. The debate about the general conflict between old-age beneficiaries and young age groups over social security pensions is provided in Chapter 12. The confidence in the long-range fis-

cal viability of the social security program and its relationship with the actuarial status of the program is discussed in the next chapter.

The articles concerned with the issues concerning the financing and economic effects of social security and its redistributive aspects in the second part of the book are evaluated in the third part of the book. Three chapters in this part comment on issues including the windfall gains to start-up generations, the complexities in the treatment of single earners and of one- and two-earner couples, the lack of certainty in the financial projections prepared by the actuaries, and the legal foundations and administrative structure which have engendered the supported political culture for social security.

The final part of the book concentrates on the future and the issues of the reform. A wide range of reforms to be avoided are also identified in this part. Fundamental principals underlying a future reform of social security system and a number of issues including delays in both the normal and the early entitlement age are examined in Chapter 17. A reform package to restore actuarial balance is presented in the last chapter.

This book, which is the result of a long and hard work of an eminently qualified group of authors, is a useful resource for all participants in the social security. As the authors of the chapters in this book avoid technical jargon, people who know very little about pensions can get a comprehensive overview of contemporary social security issues. By enlarging the community of the well informed, the debates about the basic principles that define the scope and purpose of social security discussed in this book will guide policymakers as well as all readers to restructure the system.

Pension Fund Investment Management, Ed. Frank J. Fabozzi, McGraw - Hill, 1990, ss. vii+306 .

The need for social security is compensated through various means in different societies from the beginning of history. While the in-house solidarity played an important role at first, the aid extended to the poor by the state and individuals, mostly due to religious or some other instincts, began to take its place. The system began to change in the Middle Age, and the professional organizations played the main role until the industrial revolution. In the second half of the 1800s, the establishment of modern social security systems, diminished the role of in-house solidarity and the professional organizations. The last ring of this chain is the private pensi-

on systems.

The significantly growing financial assets of institutional investors that manage private pension funds and the level they reached today, caused the subject of management of these funds to become a very important issue. The book "Pension Fund Investment Management" edited by Frank Fabozzi, is an excellent source that sheds light on the complex responsibilities of fund sponsors and their advisors and on new techniques helpful in overcoming the problems that occur in the management of these funds.

The book contains 15 chapters written by different authors. Although each chapter handles different subjects, the overall message of the book is about long-term goals, policies and strategies which are compulsory for a successfull pension fund management. An author mentions that in managing a pension fund the whole is far more than the sum of its parts.

The second chapter, written by Jeffery V. Baileys proposes a world-view where sponsors are objective risk controllers and long-term planners as opposed to short-term return maximizers.

Chapter three, written by Robert D, Peter L, entitled "Defining and Managing Pension Fund Risk", discusses the role in asset allocation that pension fund risk plays. Furthermore, it is mentioned that the nature of liability risk is not as simple as it seems.

In the fourth chapter "Managing The Asset Mix: Decisions and Consequences", the writer Arnott stresses the importance of not allowing the market to determine asset allocation policy.

Garry Allen, Mark Finn and Daniel Coggin discussed the subject "Organizing Internal Asset Management for the 1990s" in chapter five and proposed a way to manage internal managers that is a dramatic departure from the traditional pyramid management method. The following two chapters examines the use of benchmark portfolios and the way of using benchmarks to define and fill managers assignments. The writer also examines building fixed portfolios and the future of benchmarks for other asset classes such as real estate. Both of these chapters emphasize the role of benchmarks in determining the desired risk/return profile of the funds.

Chapter eight stresses the importance of viewing portfolio risk arising from the fund's managers. Grinold mentions that compensation plans based on assets under management are not consistent with the sponsor's goal of maximizing the value added capability of aggressive managers.

Divecha and Nick Mencher the author of chapter nine titled "Managers Fees from Performance Viewpoint" focuses on the limits of fees based on

assets under management. The authors mention that the performance fees require sponsors to exercise greater care and vigilance in their management of managers.

The following five chapters focus on the relationship between sponsors and their managers. Chapter 10 "Structuring Managers Using Fundamentals" discusses the fact that using an optimized allocation process to incorporate the skills and styles of managers, sponsors can better link their managers to the fund's overall policy guidelines. The idea of viewing fund management as an organic whole is continued in the discussion of selecting managers in Chapter 11 titled "Money Manager Selection: A Top Down Approach". "Attributing Performance to Sponsors and Managers" is the title of the following chapter whose author Surgz argues that the effects on performance of managers' and sponsors' decisions can be difficult to untangle, but must be understood if the fund is to succeed.

Margarett H. the writer of Chapter 13 focuses on the sponsor's role in overall fund performance. This chapter entitled "Selecting an International Investment Manager" focuses on the key issues of selecting an international benchmark, deciding whether or not to hedge currencies, selecting between active and passive management and selecting an investment style.

In Chapter 14 the author, Keith P., presents the problems inherent in one of the most controversial sets of standards for corporate pension plans. The author suggests that the rules should be reconsidered and revised to better accomplish their initial goals.

The last chapter "Blurring Lines Between Public and Private Pension Funds" by Mencher, mentions the increasing similarity between the methods used by corporate and public funds. The author also argues that an ethical dimension to fund management might help to attract and keep capable personnel in the public sphere.

Pension Funds: Retirement-Income Security and Capital Markets, An International Perspective, E. Philip Davis, Oxford University Press, 1995, pp. xii + 337.

Population ageing will be one of the most determined characteristics of the 21. Century. Whereas people over 60 were 10-15 percent of the world

population in the 1990s, this rate is expected to be 20-30 percent by the 2030s. This change will lead to more retirees, less labour force, more social security cost, less productivity and efficiency, lower economic growth due to less saving and investment, bigger budget deficit and higher inflation.

This book offers an overview of the economic issues relating to the development of funded pension schemes to complement social security as a possible approach to rapid population ageing in the industrial countries. To analyse the structure, regulation and performance of pension funds and experience regarding social security, the material were provided from twelve OECD countries - the USA, the UK, the Netherlands, Switzerland, Sweden, Denmark, Japan, Canada, Germany, Australia, France and Italy- and two developing countries - Chile and Singapore.

Pension funds, which can be defined as financial intermediaries, usually sponsored by non-financial companies, which collect and invest funds on a pooled basis for eventual payment to members in the form of pensions, have a pervasive influence on the economy, affecting the maturity and the magnitude of savings, patterns of employment and retirement, adequacy and distribution of retirement income, and corporate finance. They are conventionally seen as merely one part of a system of income provision for old age. The other parts include compulsory flat-rate or earnings related social-security pensions which are usually pay-as-you-go (workers pay pensioners directly); individual saving such as life-insurance-based savings plans and purchase of residential property; support by the family; and work after retirement.

The book contains eleven chapters, one conclusion chapter and two appendices. The first chapter-overview of the economic issues- introduces the main economic issues relating to pension funds distinguishing defined-benefit and defined-contribution plans and outlining the features of pension funds by contrasting them with other types of financial institutions.

The second chapter, named as "the economics of social-security pensions", provides a complementary analysis of issues in pay-as-you-go social security, the main alternative to funded private schemes, whose problems lead private schemes to be increasingly favoured. The advantages of social security as well as its disadvantages are also mentioned and in order to ensure retirement-income security, a combination of pension funds and social security is recommended.

The heading of Chapter Three is "the structure of pension provision in

twelve OECD countries". It introduces the main features of private pension funds and their relationship to social security, in twelve OECD countries in the light of the previous chapters.

The taxation of pension funds is the subject of Chapter Four. Taxation is an example of a regulation that can stimulate pension-fund growth. Taxation forms and tax treatments for pension funds in twelve OECD countries are studied in the chapter.

Chapter Five assesses the main issues in pension-fund regulation, comparing and contrasting the adopted solutions in the countries studied.

The sixth chapter reviews the performance of funds. The test of the economic efficiency of funded pension schemes lies in the rate of return and risk they offer to workers and companies relative to those that could be obtained via pay-as-you-go system. Rates of return and risks depend on the asset allocation and therefore have an influence on capital markets.

In Chapter Seven, the effects of the development of pension funds on the capital markets are discussed. Pension funds tend to support the supply of long-term funds to capital markets along with efficient allocation of funds.

Two of the issues raised by the analysis of pension funds in the capital markets are corporate finance and international investment. As main providers of corporate finance, the role of pension funds in the economy as a whole is discussed in Chapter Eight. In Chapter Nine, growing international investment of pension funds are analysed.

Defined-benefit and defined-contribution plans as types of pension funds are discussed in Chapter Ten. Finally, Chapter Eleven introduces the main issues relating to old-age security and the capital markets in developing countries and the role the pension funds can play therein. The developing countries selected are Chile and Singapore. Issues arising in these two countries are similar to those in developed twelve OECD countries.

"*Market Timing Models*", Richard Anderson, Irwin Professional Publishing, Chicago 1997, ss. xxi+214.

There has been a remarkable amount of publication on the securities portfolio investments since 1950s. While studies written on static asset allocation methods have constituted the bulk of these publications, dynamic models and tactical portfolio management implications have started to ap-

pear in the scientific articles especially in the last 20 years. Although he does not have an academic background, Richard Anderson, who has a well-known reputation in the Wall Street due to his distinguished experience in portfolio management as a practitioner, endeavors to define fundamentals of an effective and dynamic portfolio management. The book, in general, presents detailed description of modeling for all companies in the bonds and equities market, the uses of regression analysis in market timing forecasting, and the evaluation of portfolio performance.

Introduction of the book delivers conceptual definitions. In this chapter, "market timing" is defined as an investment strategy in which funds allocated to a designated set of assets are adjusted on an ongoing basis in response to changes in return, volatility or correlation forecasts. The book uses the newly emerged term "tactical asset allocation" instead of the term "market timing." Concepts, which have gained importance in the financial markets, such as return, correlation and variance are redefined in the context of market timing strategy. In addition, it is mentioned that, in today's conditions, the forecasting stages should be evaluated in a dimension that includes actual trading strategies.

The first chapter of the book explores the linear regression models, which can be configured using single or multiple predictor variables in the stock and bond markets. After providing approaches regarding forecasting and predicting of market prices by means of the models, solutions to the problems that arise as a result of new variables in cases of insufficient explanatory variables, are discussed. In order to explain the dividend yield as the predictor variable, stock market return is used as the first forecast variable, and P/E ratio as the second. Furthermore, sensitivity analyses of several predictor variables are demonstrated through easy to understand samples.

The second chapter includes four forecasting models for four different markets, using Standard & Poors data. These models are the stock market model, the bond market model, the currency market model and the large vs. small capitalization relative performance model. In evaluating the output of the regression models, Durbin-Watson statistic, R-Squared measure and tests are considered in order to guide the investors of the related markets. In one of the case studies, excess return is defined in order to forecast the volatility of the S&P 500 Index. The excess return is calculated through subtracting the return on one-month Treasury bills from the total return on the S&P 500 Index. Dividend yield, 12-month percent change in the consumer price index for urban consumers (CPIU), 12-month change

in the credit quality spread, the natural logarithm of 24-month price return on the S&P 500 and free reserves of the Federal Reserve Board are used as predictor variables. The last section of this chapter, considers the Canadian/US relative inflation, 24-month percent change in oil stock prices, 24-month percent change in the Canadian $ exchange rate and the Canadian Treasury bill rate as predictor variables of the Canadian Dollar Model where the Canadian/US $ rate is the forecast variable.

The third chapter covers the evaluation of results of forecasts in line with the previous chapters as well as different portfolio management strategies and market timing in the context of long-term investment strategies. The sub-chapters simulate the models introduced and as a result of testing the considered models, the "Wall Street Simulation" approach is supported.

Methodologies employed by prominent Wall Street strategists Zweig, Kerschner and Garzarelli are presented in the last chapter. Indicators used by Zweig to evaluate the markets, Kerschner's approaches which depend upon fundamental financial theories, and Gazzerelli's models that take into account the economic and industrial effects on the fundamental analysis, establish the links of the book with the actual practices in the markets. The aim of providing these three samples is to show that every market participant can reach his/her own timing and forecasting method by himself/herself.

Consequently, it is obvious that, investors also require investment timing and strategies in addition to fundamental data. Within this context, Anderson's book, "Market Timing Models", with its solid and explicit style which is far from theoretic details, assists all market participants who would like to configure their own portfolio.

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