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Articles

A Proposal for a Deposit Insurance
System in Turkey

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Abstract
The aim of this study is to evaluate the current deposit insurance system in
Turkey and present some suggestions that may increase the effectiveness of
the system. To our best knowledge, this is the first article in English
regarding the Turkish deposit insurance system. Section II provides an
introduction to the deposit insurance system. Section III is devoted to the
investigation of different approaches to the deposit insurance concept. Some
problems that may stem from deposit insurance are discussed in section IV.
Section V offers some suggestions that can increase the effectiveness of the
present system. The final section summarizes our results.

I. Introduction [**]
The instability of the banking sector, deficiency in payment systems
and decrease in savings rates in a country can lead to the destruction

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[**] This article is the revised and summarized version of Balaban and Çilli (1995) which
was completed in October 1995. That study, available from the authors upon request,
investigates in detail the country experience with respect to deposit insurance applied
in the developed and developing world as well as determination of deposit insurance
premiums. The present article particularly focuses on some suggestions for the
establishment of a new system in Turkey as in Balaban ve Çilli (1996). See Balaban
(1996), developed from the current work, for a proposal to establish an investor
protection scheme in all financial institutions and pricing details.

of the financial intermediation process between banks and the real sector, and in turn, small investors may realize large losses. Hence the banking sector is closely supervised by authorized agencies in almost every country.

The protection of stability in the banking sector is usually provided by the relevant departments of the supervisory bodies established to fulfill this need. These departments or units try to prevent the banks from taking risks more than socially acceptable and verify that banking transactions are in accordance with the effective legislation.

Although the supervisory agencies play an important role in controlling the banking sector, several country experiences show that depositors may need some other protective institutions when the banking sector faces payment difficulties. It is well known that bank runs are a common practice in this case where even banks with better financial standing can have troubles. The historical bank runs in several developed and developing countries are the basic reason to establish a deposit insurance system to protect depositors. Turkey is not an exception in this sense.

The developments in the Turkish banking sector until now show that the present deposit insurance system cannot provide depositors with enough protection. The best evidence in support of our claim is that the government has announced that all bank deposits are under state protection following the bank runs during the 1994 economic and financial crisis. For this reason, we think that it is necessary to review and restructure the present deposit insurance system in Turkey.

The primary aim of this study is to evaluate the current deposit insurance system in Turkey and present some suggestions that may increase the effectiveness of the system. To our knowledge, this is the first article in English regarding the Turkish deposit insurance system. Section II provides an introduction to the deposit insurance mechanism. Section III is devoted to the investigation of different approaches to deposit insurance. Some problems that may stem from deposit insurance are discussed in section IV. Section V presents some suggestions that can increase the effectiveness of the present system. The final section summarizes our results.

II. What is a Deposit Insurance System?

An insurance contract essentially provides the insured with a guaranty that the insurer pays all losses in case of the realization of a risk specified in the contract. For example, a health insurance policy compensates fully or partially expenses in case of sickness or accident. In health or other usual insurance contracts, the insurer is not expected to take measures against the risks specified in a particular contract. On the other hand, the deposit insurance system aims at preventing bank runs if only a few banks have payment difficulties in the whole banking sector.

The previous international evidence shows that rumors about banks easily attract large audience and bank runs can be a common practice. This may lead to payment and liquidity problems for banks that have good financial standing. As such, a great number of bankruptcies can be seen.[1] The deposit insurance system is established to prevent these kinds of developments in the financial system [2]

Depositors should trust the deposit insurance system since it fulfills its role in preventing bank runs. This can be achieved if depositors are sure that they will not lose their money even if their banks bankrupt. Thus bank runs that may increase during the periods of financial crisis can be prevented by such a system. If depositors' confidence cannot be achieved, the banking system seems weaker.

The deposit insurance system is generally established by a law stipulating the rules and regulations regarding the operation of the system. This law regulates, in general, the amount and type of insured deposits, characteristics of insured financial institutions, funding, the legal procedure in case of a bankruptcy, and

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[1] The recent experience in Turkey in April 1994 sets a good example in this sense. Payment difficulties in three Turkish banks had adverse effects on the whole banking sector. The associated bank runs could be prevented by the government intervention. On 5 May 1994, the government has announced that all bank deposits are under state protection.

[2] There is voluminous research on deposit insurance in the international literature. For the interested reader we add a large section of references at the end of the article. See also Balaban, Çilli (1995, 1996) and Balaban (1996).

mandatory or voluntary participation in the system.

III. Deposit Insurance Systems [3]

Deposit insurance systems can be classified into three categories with respect to the amount of insured deposits. The limited deposit insurance system has pre-specified restrictions on the amount of insurance. The 100% coverage system insures the whole amount. The discretionary system lies between the limited and 100% coverage. In this system, the pre-specifed rules can be amended in favor of depositors by a government decision in case of a bankruptcy.

The limited system insures a certain amount of deposits and the rest is excluded from the guaranty scheme. This system favors small depositors. Large depositors are assumed to follow the risk level of a certain bank better than small investors. It is also assumed that they can bear a high interest rate, and in turn, a higher return for the increased risk. Therefore, this can lead to the maintenance of market discipline. In this system, the insurer has no authority to provide financial assistance to a troubled bank, and to rehabilitate or merge.

In the 100% coverage system, there is no restriction on the amount of insured deposits. In this system, the insurer has a power to assist a troubled bank, rehabilitate or merge to solve the problems of the insured bank.

In the discretionary system, a certain amount of bank deposits is insured. According to this limit, the discretionary system is similar to the limited system. However, in special cases the excluded deposits are also covered by the insurance system. These special cases can be, say, economic and/or financial crises where the whole banking sector experiences bankruptcies. In short, the discretionary deposit insurance system works like the limited system in normal times of economy while it shifts the 100% coverage system in crisis periods.

IV. Some Problems with Respect to Deposit Insurance System

The literature of this field agrees that one of the most important

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[3] We heavily depend on Talley and Mas (1992) in this section.

problems that may arise from the deposit insurance system is moral hazard.[4] The moral hazard problem here is due to the encouragement of the insured banks to take more risk. The effect of moral hazard is the highest in the 100% coverage system. In addition, it is also high in a system where all banks pay equal deposit insurance premiums. The moral hazard effect is seen because of limited liability of banks that may involve more risky business. Note that, there is a positive relationship between risk and return. If banks realize high returns, there is no problem and every part in the system is content. However, if banks realize large losses because of their riskier business and face insolvency at the end, the insurer must assume these losses. If deposit insurance premiums are not differentiated in accordance with the risk levels of banks, risk is not priced and banks do not have additional costs because of riskier business. This may lead to an increase in the overall risk level of banks.[5] If all banks behave in the same way, the stability and soundness of the financial system can be adversely affected.

The deposit insurance system affects not only the behavior of banks but also that of depositors. If all banks pay equal premiums and the 100% coverage system is in effect, depositors do not care about the risk level of a bank. For this reason, if the risk level of a bank increases, depositors do not demand higher rates of interest rates to limit the banks' risk. Technically considered, they do not price risk. As such, banks are inclined to take more risks.

V. Deposit Insurance System in Turkey and Some Suggestions

The deposit insurance system in Turkey is regulated by the Banking Law. The first application of deposit insurance depends legally on the By-Law no. 70 which amends the Banking Law. Here, a certain amount of bank deposits is insured. Therefore, Turkey implements a limited system. During the periods following this regulation, deposit insurance loses its importance. After the developments emanating from the 1994 economic and financial crisis, the By-Law dated 22 June 1994 and no. 538 aims at improving the system. However, we think that the present system cannot provide

[4] See, for example, Mester (1990) on this topic.
[5] See Flood (1990) for a discussion on this issue.

depositors with confidence if its philosophy and structure are closely examined.

The rest of the present work investigates the Turkish system under the general rules regarding deposit insurance and discusses its deficiencies. We follow an approach that takes depositors' confidence into account. We think that depositors' confidence heavily affects the success of a deposit insurance system.

The most important characteristics of the deposit insurance system in effect are that political authority has a power on the decision-making process and it uses this power through a state Minister responsible for economic affairs. With this nature of the system, it turns out to be a discretionary system. The most important evidence in support of our view is that the present structure operates as a limited system during the periods of relative stability in financial markets while it becomes a 100% coverage system during the crisis periods as in 1994.[6]

The most serious problem with the current system is that operational rules of the system are not well defined and the political authority has the main power. This leads to a serious bias and subjectivism in the system. This approach is also clear in the Banking Law. The present system is heavily reliant on the decision of the politicians rather than well-defined and pre-specified legal rules. The uncertainty of politicians in the decision-making process in case of a financial instability makes the system and all parties vulnerable to additional uncertainty.

We believe that one should discuss the following points to make the current system better: **1)** whether it is necessary to establish an explicit deposit insurance system, **2)** whether the insurer should be a public or private institution, **3)** whether participation in the system should be obligatory or voluntary participation for banks, **4)** how bankruptcy should be administrated, **5)** which type(s) of deposits should be insured, **6)** which amount of deposits should be insured, **7)** whether an insurance fund should be established, **8)** how the deposit insurance premiums should be determined, **9)** how the system should be financed, **10)** how moral hazard effects can be

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[6] See footnote no.1.

eliminated, and 11) how public banks affect the deposit insurance system.

5.1. Should an Explicit Deposit Insurance System be Established?
A guaranty to the depositor can be provided in two basic ways. The first one is to establish an official deposit insurance system. This is called an explicit system in the literature of this field. The explicit systems are classified in section III. Instead of establishment of an explicit system, a second way can be that the public authority takes necessary actions when the banking sector faces a financial crisis. This is called an implicit system (Talley and Mas, 1992).

The sense of confidence in the decision-making process of the banking sector participant is empowered by an explicit system although it has initial and continuous social costs. On the other hand, an implicit system does not have initial social cost but depositors feel less confident in such an environment. In addition, no one can say that the costs incurred in an implicit system after a banking crisis can be less than total costs of an explicit system. Finally, there are no rules to prevent public authority from taking arbitrary measures in an implicit system.

According to the above discussion, we propose that an explicit deposit insurance system should be established in Turkey. We also suggest that international experience accumulated concerning such systems should be paid due attention.

5.2. Public or Private Ownership
The nature of deposit insurance makes it a public function.[7] It aims at protection of interests of all parties in the banking sector and maintenance of stability and soundness of the financial system. This requires that the deposit insurer should seek different aims than profit maximization and behave as an arbitrator among market participants. If international experience is closely investigated, we see that most of the deposit insurance institutions are public organizations.

According to the above discussion, we believe that a public deposit insurance institution in Turkey can be more useful and in

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[7] See Russel (1993) for the role of public in deposit insurance.

accordance with the aims of such a system.

It is unquestionably desirable that all problems stemming from the deposit insurance should be solved within the system itself without any government intervention. However, compared with the long-lasting tradition of *etatism* in Turkey tells us that investors display more confidence in public institutions than private ones.[8] In addition, a publicly-owned system can raise extra funds easier compared to a private organization when it is necessary. For these reasons, the deposit insurance system should be established as a public enterprise at least in the preliminary phase. A final point in this section focuses on how a public organization should be created.

The present deposit insurance system is managed by the Savings Insurance Fund (SIF), a department of the Central Bank. The regulation of deposit insurance is a cooperative activity between the Treasury and the Central Bank.

The depositors cannot trust the present system because the political authority has a decisive role and there are deficiencies and uncertainty in the operative rules of the system. An obvious evidence in support of our view is that the government announcement, dated 5 May 1994, concerning the state guaranty for all bank deposits to prevent bank runs after the 1994 crisis. For this reason, we believe that the current system should be changed and restructured.

The present system also creates communication and authority problems between the Treasury and the Central Bank. This is highlighted even by daily press coverage as in September 1995. During the unstable periods in the financial system, communication problems cause significant lags in intervention.

One can add more structural reasons, emphasizing that the present system cannot function well. We propose that a new unit, **Undersecretariat of Banking**, should be established by the relevant departments of the Treasury and the Central Bank.[9] A separate organization can lead to a faster information flow and elimination of

[8] Our view is supported by the fact that, after the 1994 financial crisis the depositors withdrew their savings held in small banks in favour of public banks.
[9] Balaban (1996) suggests to establish a financial institutions insurance system and Undersecretariat of Financial Institutions.

authority chaos. For instance, determination of deposit insurance premiums, investigated later in this work, can be easily facilitated.

It is vital that the new unit should be free from political intervention to prevent a possible instability in the financial system. To this end, this unit can be constitutionally regulated and made accountable to the Parliament instead of the government.[10] In addition, managers of this unit should also be accountable and should be sanctioned.[11]

5.3. Obligatory or Voluntary Participation

We believe that participation in the deposit insurance scheme should be obligatory for all banks if the significant role and share of the banking sector in the Turkish financial system are taken into account. It should also be noted that, troubled banks adversely affect payment systems in a country. For example, systemic risk, liquidity and credit risks in electronic payment systems increase. Another important point is that depositors mostly choose banks participating in deposit insurance scheme. This choice may increase cost of capital for the banks excluded from the system.

Voluntary participation in a deposit insurance system may also lead to adverse selection and moral hazard problems.[12] The former problem is associated with the fact that generally banks with weak financial standing choose to participate in the system. This increases the risks undertaken by the deposit insurer, and in turn the deposit insurance premiums. An increase in premiums may leave the weakest banks within the system. The latter stems from the fact that banks voluntarily participating in the system can choose to invest in riskier projects.

5.4. Administration of Bankruptcy

In case of bankruptcy of a bank, the behavior of the deposit insurer and timing and way of compensation of depositors are of great importance. It is necessary that the deposit insurance regulation should clearly explain these points for the success of the system. This

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[10] We borrow this view from Gültekin (1995).

[11] A similar rule is valid for the managers of the Federal Deposit Insurance Corporation in the U.S.

[12] See Wheelock and Kumbhakar (1995).

also improves the confidence of investors.

The administration process for the finalization of bankruptcies in the Turkish deposit insurance regulation seems inadequate and ineffective. Leaving this process completely to the political authority brings uncertainty. Article 64 of the Banking Law states for the actions to be undertaken for the troubled banks that *"the Minister has full authority to demand that a bank is asked to take necessary actions when, in supervision, a bank is ascertained that it has serious financial weakness, to submit the bank to the Savings Insurance Fund if the previous corrective actions do not help or to apply the Article 68 for the bank."*[13] In addition, according to the Banking Law, there are no sanctions for the Minister if depositors realize losses stemming from any misapplication or delays in the application of the law. Therefore, the Minister enjoys full authority but no responsibility.

The above regulation has two major deficiencies. First, troubled banks can lobby to postpone the application of the law, even it may never be applied. This may lead to an increase in the risk level of a troubled bank since it may choose to increase its borrowing costs. Second, delays in the liquidation of a financially distressed bank increases losses of the deposit insurer. Put differently, social costs of bankruptcy may increase.

We believe that establishment of a new system free from political intervention can be useful. The new system should clearly explain the behavior of the deposit insurer and the objective criteria to be followed in case of a bankruptcy under the Banking Law.

Another deficiency of the present system is the uncertainty regarding timing and nature of the payments by the Savings Insurance Fund. It is legally uncertain when compensation of depositors starts if a bank is liquidated. The timing of payment is particularly important in a high inflationary country like Turkey. In addition, compensation instruments are not definite and the SIF is authorized to decide on it. According to this, it is possible to fully or partially compensate depositors by giving shares to them.[14] This

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[13] See the Banking Law (1994), 79-82.

[14] Article 65/1c of the Banking Law.

adversely affects the confidence of depositors because they invest their savings in cash and demand to be compensated in cash.

Any uncertainty regarding the compensation process should be minimized by regulation. Payments by the SIF should start immediately after the SIF announces that the bank is not authorized to accept deposits and engage in any banking activity. Compensation should also be completed within three months in line with the   international experience. This period can be extended to three months if required.

Depositors should be compensated by cash or marketable Treasury bills. Compensation by shares should be eliminated.

5.5. Type of Insured Deposits

The present deposit insurance system authorizes the Cabinet to determine the type and amount of time deposits to be insured.[15] Certainly, time deposits, an important funding source of banks, should be covered by the insurance system. However, it is uncertain whether sight deposits are insured. In our opinion, it is necessary to explicitly include sight deposits in the system. In addition, such an uncertainty makes the current system discretionary.

We propose that the Turkish deposit insurance system should cover deposits of real and legal persons.[16] In developed countries, deposits of legal persons are excluded from the system. It is assumed that institutional depositors should and can follow changes in the risk level of a bank more easily compared to individual depositors. However, at this moment, we find it useful that institutional clients should also enjoy insurance coverage to maintain financial stability.

Time deposits, with a maturity longer than one year, should be excluded from the coverage. Here, we aim to encourage long - term depositors to follow risk level of a bank closer.

We propose that only Turkish lira deposits should be insured. The exclusion of foreign exchange deposits may prevent currency substitution which is already high in Turkey. In addition, the deposit insurer does not also assume exchange risk.

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[15] Article 67/2 of the Banking Law amended by the Law no. 3291.

[16] See Balaban (1996) for a discussion on insurance coverage of the other invesment insturments.

Deposits of the banks' top managers and their relatives, shareholders with a share of more than say, 5%, independent auditors of the bank, top managers of companies controlled by the bank should also be excluded from coverage. In addition, employees personally responsible in the bankruptcy of a bank should not have deposit guaranty.
deposit guaranty.

Deposits held in foreign branches of the Turkish banks should not be insured also. Deposits held in the Turkish branches of foreign banks should be covered only if the foreign country does not provide any protection.

The deposit insurance system should not insure bills, bonds and asset-backed securities issued by a bank.

5.6. Amount of Insured Deposits

Deposit insurance can be established either as a limited arrangement or as a 100% coverage system. However, each system has different effects on the stability of the financial system.

The limited system assumes that depositors do not have any incentive to follow the risk level of a bank if the entire amount of deposits is insured. This moral hazard effect leads depositors to focus on only return and disregard the risk level. This causes a decline in market shares of low-risk banks. These banks may also increase interest rates to be able to compete well. Therefore, a 100% coverage system may lead to an increase in market interest rates. In addition, banks may get involved in riskier business to compete with each other. Hence, overall risk of the banking sector may increase.

We propose that a limited amount of deposits should be insured. In a limited system the adverse effects of deposit insurance on market interest rates and the risk level of banks is less compared to a 100% coverage system.

Another important point involves the question of how big insured deposits should be. A generally-accepted principle in the literature of this field is that small accounts should be insured. [17] This is for that owners of big accounts can better follow riskiness of a bank

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[17] See, for example, Mester (1990), 18.

compared to the owners of small accounts. They can limit the risk of bank by demanding higher rates of interest.[18] However, this does not necessarily mean that small depositors are absolutely unaware of the risk level of a bank. We propose that, in Turkey, a small number of deposits or only small depositors should enjoy insurance. To this end, one should follow the number and share of accounts within total deposits with respect to their amount. For example, if accounts between 1-2 billion Turkish liras outnumber other accounts with different amounts in the second quarter of 1995, the upper limit of insured deposits should be 2 billion Turkish liras.

We suggest that the upper amount of insurance can be limited to 15,000 ECU.[19] This is also important for harmonization with the European Union.[20] We contend that this amount is not small if we note that per capita income and savings rates in European countries are higher than those in Turkey. The determination of the insured amount in terms of ECU, instead of Turkish lira, provides depositors with hedging against inflation. If the insured amount is set in terms of Turkish lira, it should be revised biannually or yearly.

We think that co-insurance can be useful to introduce in Turkey as in many countries. Co-insurance means that there is a limit on the payment rate for the insured deposits. This rate is 90% in the European Union. In this case, if maximum payment is limited to one billion Turkish liras, the insurer pays this amount to a depositor with an account of 1.111 billion Turkish liras. If a person deposits one billion Turkish liras, the compensation will be expanded for only 900 million Turkish liras.

If the decision-makers adopt our proposal, this may bring different effects. First, big depositors divide their investments up to the maximum insurance limit and diversify across banks. This may change market share of the banks.

Second, in case of bank runs the banks realize less cost. Explained differently, small amounts of withdrawal is less costly compared to big ones.

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[18] Mester (1990), 18- 19.

[19] As of 29 September 1995, 1 ECU was equal to 63,777 Turkish liras. 15.000 ECU was about 956 million Turkish liras.

[20] See Balaban and Çilli (1995).

Third, banks may choose to open new branches to serve small depositors. This may increase costs of banks in the short run. However, with the other opportunities of retail banking, banks may be better off in the long run.

5.7. Establishment of an Insurance Fund

Following the establishment of an explicit deposit insurance system, one should decide whether an insurance fund should be established. There are two main approaches to answer this question. First, the deposit insurer demands required premiums from the participating banks in case of a bank failure, instead of establishing a fund at the beginning. Second, an official fund is established at the beginning and all members of the system are asked to pay regular premiums. The first approach seems less costly because it does not demand any resources initially. On the other hand, it may be difficult to raise the required funds if needed, since when a banking panic erupts, all banks may encounter troubles.

We suggest that an insurance fund should be established and all banks should be required to pay annual premiums according to their risk levels. This is highly important in Turkey, which is living through a continued high inflation environment.

5.8. Determination of Deposit Insurance Premiums

The determination of deposit insurance premiums is of great importance. In practice, banks are required to pay premiums out of total deposits they collect. Deposit insurance premiums should be differentiated across banks. Otherwise, the perceived risks are not properly priced across banks. This encourages the banks to involve in riskier business because they do not face additional costs. Therefore, in a deposit insurance system, banks should not pay equal premiums.

The present deposit insurance system in Turkey does not adequately differentiate banks according to their risk levels. The current regulation provides two risk categories according to capital adequacy ratio. The annual premium paid by a bank, whose capital adequacy ratio is below 8, is 26 basis points per unit of deposit whereas a bank with a ratio above the 8% pays 25 basis points.[21]

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[21] See the Council of Ministers Decree (1995),1-2.

The present premium rates cannot well discriminate banks with respect to risk exposure because we believe that there is no meaningful   difference between 25 and 26 basis points.

We propose that each bank should pay annual deposit insurance premiums according to its own risk level. In addition, the Undersecretariat of Banking, herein proposed to be established, should announce these required premiums in all branches of banks.

Risk-based deposit insurance premiums can be determined according to the capital adequacy ratio, the CAMEL[22] method or option pricing. The CAMEL method is used by the Turkish Central Bank to monitor changes in risk levels of banks. The first two methods group banks with respect to certain risk measures. Option pricing can be used if the market value of the bank's assets is known or can be successfully approximated.[23]

5.9. How to Finance Deposit Insurance Fund

It is important for an explicit deposit insurance system to specify how an insurance fund should be financed. A first question is whether an initial contribution is necessary. Initial contribution increases costs but improves depositors' confidence. We suggest that, for the success of the Turkish deposit insurance system, all banks should provide initial contribution in accordance with their risk levels. In addition, the Central Bank and/or the Treasury should also contribute. Their contributions can be the specific sum of other banks operating in the system.

A second question is whether a minimum level for fund assets should be set. We support that, to maintain the confidence of depositors, a target should be set and all banks should contribute additionally if fund assets go below the target.

Another question regarding financing is how and where fund assets should be invested. For the success of the system, we suggest that fund assets should only be used in ways consistent with the fund's aims. This should be regulated by law. For example, fund assets should not be used to finance budget deficits even temporarily.

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[22] CAMEL stands for capital adequacy, asset quality, management, earnings and liquidity. See Balaban and Çilli (1995) and Balaban (1996).

[23] See Balaban and Çilli (1995) and Balaban (1996).

5.10. Dealing with the Moral Hazard Problem

As previously noted, deposit insurance systems may lead to moral hazard problems in the banking sector. This stems mainly from that banks generally operate under limited liability where only bank assets are at risk in case of a bankruptcy. We believe that a well defined personal liability may limit the adverse effects of moral hazards.

Article 69 of the present Turkish Banking Law defines personal liability considerations. If this rule is properly applied, moral hazard effects can be minimized. For example, in case of a bank failure, top managers and/or other employees personally responsible in this failure can be sanctioned. However, personal liability can be claimed by the Minister, the bankruptcy administration or the merged bank. However, the minister and the bankruptcy administration represent political authority.[24] Therefore, the application of personal liability seems to be a political process. Banks can easily lobby against personal liability. We suggest that a clear regulation should be devised that makes personal liability an automatic process rather than a political one.

5.11. Public Banks and Deposit Insurance

Public banks have a significant share in the Turkish banking sector. This nature of the system may prevent banking regulators to establish a healthy system of deposit insurance.

The 1994 crisis shows us that depositors tend to think that public banks never go bankrupt or, even if they end up bankrupt, their investments are under state protection. This tendency culminates in that depositors prefer public banks rather than private ones particularly during the crisis times. This leads to bank runs in the private banking sector. In Turkey, we believe that public banks have an implicit function of deposit insurance. Therefore, we suggest immediate privatization of these public banks in order to establish a successful and a healthy system of deposit insurance in Turkey.

VI. Conclusion

In this study, we investigated within the framework of deposit

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[24] See section 5.4 and footnote 13.

insurance how the confidence of depositors, essential for the health and credible operation of the banking sector, can be maintained. Then, we make some suggestions for the improvement of the present deposit insurance system in Turkey. We summarize our proposal as follows.

First, we think that a publicly-owned and explicit deposit insurance system where participation is obligatory for all banks, should be established. The system should be coordinated by the Undersecretariat of Banking, a new unit to be established by the relevant departments of the Treasury and the Central Bank and accountable to the Parliament instead of the government.

Second, Turkish lira deposits of real and legal persons should be insured. Deposits denominated in foreign currencies and deposits held in foreign branches of banks should be excluded.

Third, the deposit insurance system should be a limited system. In addition, a certain amount of deposits should be insured with a pre-specified payment rate.

Fourth, the antipicated risk should be priced across the banks.

Fifth, an insurance fund should be established and each bank should provide initial contribution according to its risk level. The Central Bank and the Treasury should also provide initial contribution. Banks should pay annual premiums according to their risk level. A minimum target for the fund assets should be set. In addition, each bank should be asked to pay extra premium if the fund assets decrease below the target.

Sixth, fund resources should only be used in accordance with the aims of the system. These resources should be invested in riskless and liquid assets.

Seventh, personal accountability or liability in case of bankruptcy of a bank should be introduced. This process should operate automatically and no discrimination should be allowed.

Finally, public banks should be privatized since these banks have great shares in the Turkish banking sector and play an implicit role of deposit insurer.

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A Suggestion for a Bond Index [1]

Gürsel KONA [2]

Abstract

Since 1985, the debt securities markets in Turkey have become increasingly important with an acceleration in domestic borrowing required to finance continuously substantial budget deficits. Almost 80% of total stock of securities have comprised government debt securities, as of the end of 1995. Consequently, primary and secondary markets for government debt securities have made faster progress in comparison to the equity markets. In contrast, my six years of observations as a professional in the regulation side of the industry have shown me that most of the research and academic efforts have been diverted to the equity markets rather than the debt markets.

In this study, a collection of bond indices have been suggested to measure the performance and summarize the changes in prices of bonds in secondary markets. Subsequently, theoretical background of Price and Performance Indices for four different maturity subgroups and one general Price Index (totally nine) have been introduced. Furthermore, some examples on various uses of these indices and associated comparisons, employing real data, have been supplied. These indices have been calculated and published by the ISE officially, since the beginning of 1996.

I. Introduction

Up to the beginning of the 1970s, bond yields were the only figures that measured the performance of bonds and bond markets. Bearing different maturities and durations, different coupons and prices, bonds are reduced to a common denominator, which is called the yield. Using these yields, individually and separately or taking averages, bonds can be compared with each other or with the market. Because of the importance of the yield involved, bond market analysis concerned, almost exclusively, forecasting interest rates. This way of approach is correct, when the volatility of interest rates is low and when private investors buy and hold bonds untill maturity .[3]

After the oil crisis in 1974, private investors learned that bond markets were not safe havens. Investors ran the risk of losing substantial money, even the principal, while abnormal returns were also possible like those achieved in the stock markets, depending on the prevailing interest rates. As a result, market prices of bonds, not the yields were assuming more and more importance. This remarkable intellectual and mental change led the people to consider measuring and forecasting the performance of bonds and bond markets, using more practical tools other than yields. The list of bond prices, which includes hundreds of individual quotations, was not a common, comprehensive and practical indicator, (Mella, 1991).

When a stock index is considered, a forecast of any change in the index represents also the performance of the stock market. However, a forecast of any change in the yield explains only the trend of prices, not the extent. Some market participants proposed to use the average prices calculated from these yields. This method was never carried out in a mathematically sound way. Others preferred to use the price of a single benchmark bond as the indicator for developments on the bond market as a whole. This benchmark bond was the most recently issued 30-year Treasury bonds which are subject to extremely high price fluctuations and

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[3] Mella,Frank, German Bond Index: REX, a publication of the Federation of German Stock Exchanges.

therefore, it over/underestimates the behavior of the market, when other bonds with shorter maturities are considered.

Despite the odds, the most viable and the most precise answer to the question of "how was the market?" is an index. Building indices for markets in which stocks are traded is as easy as taking geometric or arithmetic, weighted or non-weighted averages of prices for a sample of stocks. However, to construct a bond market index requires more careful studies to cope with some problems caused by the qualifications of debt securities stated below.

First, the universe of bonds is much broader than that of the stocks. Bonds are different, in terms of the issuer, coupon and maturity. Therefore, bond indices have to be divided into numerous subgroups, according to their maturities, their coupons, their issuers.

Secondly, bonds are not infinite and indefinite instruments unlike stocks. Therefore the composition of an index portfolio, as a representative for the whole market, will change when the securities are redeemed, implying that the continuity of the index will be distorted while developing historical comparisons using the index will be unfeasible. This means that a bond index will be adjusted several times a year. Additionally, lessening of maturity causes changes in the susceptibility of the bond portfolio to price fluctuations and there is no way to modify the situation. Another problem is weighting the prices or yields depending on which measure has been taken into consideration. Should the issue amount or the trading value or market value be used for weighting?

Finally, some bond issues are not as liquid as stocks. Consequently, pricing of these bonds can be difficult for the purpose of calculating an index.

This part of the study deals with construction of "bond indices" to represent price movements and performance of Turkish bond market. Actually, in literature, the word "bond" stands for debt securities, having maturities longer than one year. However, the Turkish market is flooded by short-term government debt securities. As a result, the term "Bond Indices" has been replaced with "Government Debt Securities Indices" (GDSI) and, in the remaining part of the study, this designation and abbreviation were used very frequently.

In the following pages, you will find a full description of the GDSIs, the motivation behind their development, a variety of historical returns and comparisons with real market performance. Before going through these fields of research a short explanation on the purpose and basic principles of bond indices will be emphasized.

II. Purposes and Basic Principles of Bond Indices[4]

Main purposes of a bond index should be:

• To act as a benchmark for portfolio management,

• To act as an indicator of market performances and development. This should include price and yield performances, as well as structural information, e.g. average maturity, duration, convexity, etc.

• The basis on which market options and futures may be derived and,

• A comparative tool for different markets.

In order to accomplish these objectives an index calculation should possess the following main principles:

• The indices should reflect the experiences of the average holder in the sector.

• The calculations should be reproducible by another party.

• Objective criteria should be used in selecting and processing the data.

• The above criteria, data and the calculation formula should be published.

• The index should be independent of the base date.

• The calculations must reflect changes in the structure of the market in a timely manner (e.g. new issues, redemptions, etc.)

• It should be possible to create new indices using the same methodology, which can be compared with the published indices.

• The calculations should be applicable to a wide range of bonds which belong even to different sectors.

III. The Motivation and Basic Idea Behind the GDS Indices

Since 1985, after internal borrowing gained an important role in financing the budget deficits, primary and secondary markets for

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[4] Patrick J. Brown, "Constructing and Calculating Bond Indices", Probus Publishing Company, Cambridge, 1994.

government debt securities in Turkey have become leading parts of financial markets. Until the ISE Bonds and Bills Market was established in 1991, the market was operating in an opaque, inefficient and unorganized environment. After establishing a transparent, organized and semi-automated market for bonds within the premises of the ISE, price and yield data became available for the public. However, the lack of one common, widely understandable and comparable indicator was a deficiency of the market. This study has been done to overcome the specified deficiency by creating bond indices.

As it may be realized from previous paragraphs, a bond index which is easily understandable and comparable with other indicators in the market has to convey some information related to the prices of bonds. Therefore, our main concern will be price movements of bonds rather than yields or changes in yields themselves. A change in the price of a bond has two underlying reasons;

1. The price of a bond alters depending on changes in yield levels. In other words, a shift in yield curve causes changes in the prices of bonds with constant maturities. In figure 3.1. (A)   (1 →2) movement shows how the yield of a hypothetical bond with

Figure 3.1: Two Different Movements in Prices (I.)
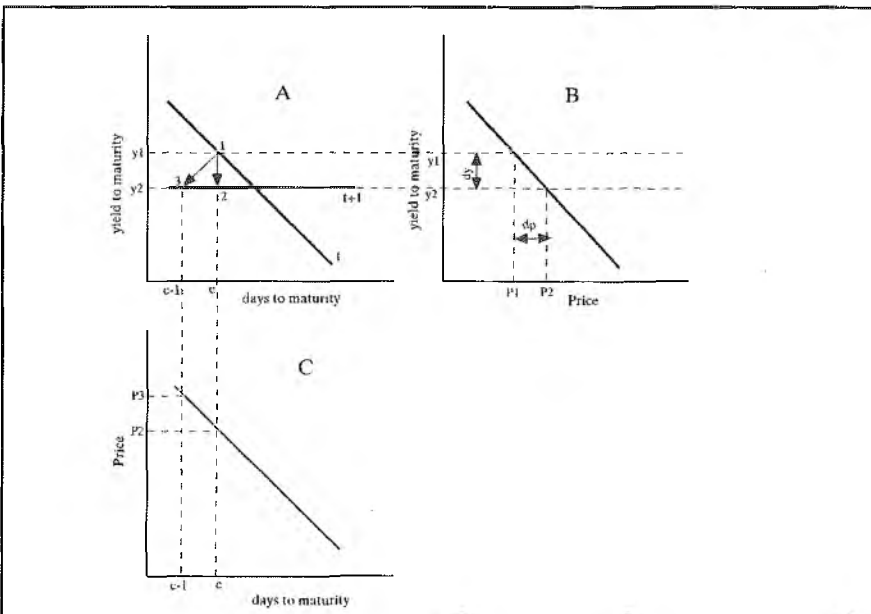
constant maturity (c) can change from the day of t to the day of t+1. The change in the yield has also an implication on the price of the bond carrying a constant maturity. When an inverse relationship between the yield and price is considered, for the illustrated example, price of the bond has increased according to previous day ($P_1 \rightarrow P_2$) (Figure 3.2).

2. Secondly, the price of a bond changes with the lessening of days to maturity other than that of the change in yield levels. Again, looking at the figure 3 yield of a bond prompted by the lessening of days to maturity. In the example, the shape of the yield curve is arbitrarily chosen and, for the purposes of illustration it is exaggerated and a change in the yield is seen in the illustration. However, a yield change may not be necessary for a change in the price. Because of the inverse relationship between price and maturity, the price of a bond will change as a consequence of the lessening of days to maturity, even its yield stays constant (Figure 3.2).

Figure 3.2 : Two Different Movements in Prices (II.)
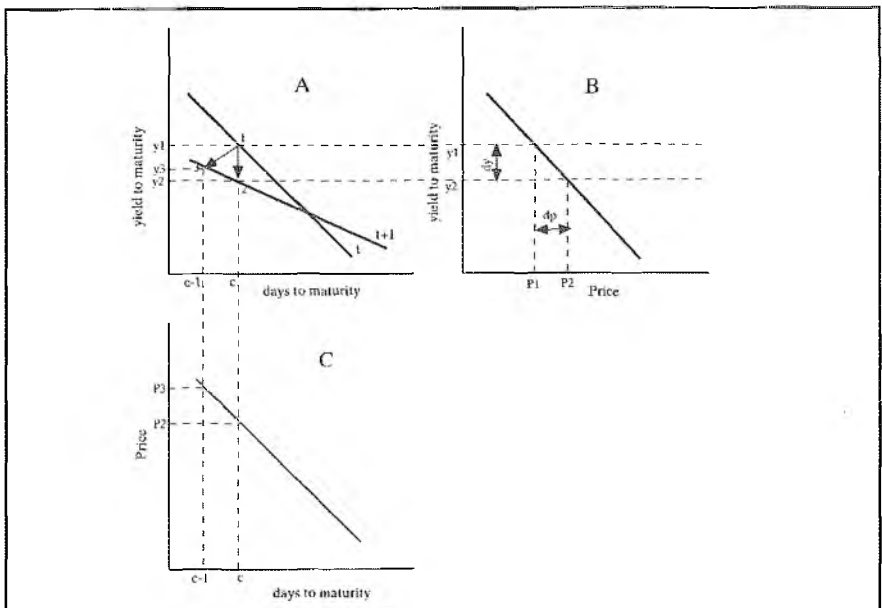
In this example, the price of our hypothetical bond has changed from P_1 in day t to P_3 in day t+1, because of the two reasons stated above.

A bond index has to show these price movements at the right time, with the same magnitude and right direction. It has to meet the demands made on the measurement precision in the field of bond research and, especially in quantitative analysis. Moreover, it has to be a good indicator for an average investor and should have the capacity to be used as a tool to create different indicators by the efficient and professional investor. Furthermore, the traders in bond markets must be able to use the index easily and efficiently for technical trading.

IV. Suggestion of Bond Indices for the ISE Bonds and Bills Market

As you have seen from the first part of the study, the Turkish bond market and its main component the ISE Bonds and Bills Market, are markets for debt securities with very short-term maturities. As a consequence, GDS indices are thought as indicators of price movements in these short-term securities.

In this study, two types of structurally different indices are suggested with the Price Index and the Performance Index. As it may be understood from their titles, the Price Index shows the changes in prices from P_1 to P_2 in Figure 3.1 while the Performance Index indicates the changes in prices from P_1 to P_3 in the same figure. Despite the fact that all the securities in the market have short-term maturities, there are a variety of "days to maturities" which make it hard to reflect all the price movements using a simple index. These terms can be grouped as 30, 91, 182 and 365 days to maturity. Therefore, to calculate different indices for different maturity subgroups will add explanatory power to the indices. This means eight different indices, four Price Indices and four Performance Indices. Additionally, a General Price Index, which is an arithmetic average of all price indices weighted by their values at the time of issue, will be introduced. The following symbolization will be useful for a conceptual framework for indices.

With the below abbreviations,

$P_{c,b}$: ISE Bonds and Bills Market daily weighted average price of a

hypothetical bond/bill with "c" days to maturity at the base date[S«1]

$P_{c,t}$: ISE Bonds and Bills Market daily weighted average price of a hypothetical bond/bill with "c" days to maturity at the date of "t",

$P_{c-n,t}$: ISE Bonds and Bills Market daily weighted average price of a hypothetical bond/bill with "c" days to maturity at "n" day after the base date ,

$IF_{c,t}$: "c" day Price Index at the date of "t",

$IP_{c,t}$: "c" day Performance Index at the date of "t",

$IF_{g,t}$: General Price Index at the date of "t" and,

$w_{c,t}$: weight of bills with "c- day" maturity in outstanding bills (according to TL amount at the time of issue).

      * Price Indices (at the date of "t");

$$IF_{c,t} = \frac{P_{c,t}}{P_{c,b}} \times 100 \tag{1}$$

    * Performance Indices at the date of "t" (which is "n" day after the base date);

$$IP_{c,t} = \frac{P_{c-n,t}}{P_{c,b}} \times IP_{c,b} \tag{2}$$

      * General Price Index at the date of "t"

$$IF_{g,t} = (IF_{c,t} \times w_{c,t} \tag{3}$$

are calculated as index values ("c-n" indicates the diminishing maturity).

V. Mathematical Aspect of Index Calculation

At first sight, the approach looks like easy to apply with the basic calculation. However, some secondary calculations are required before being ready to calculate all the indices. The stages of such calculations are specified in the following section:

1. The yields are calculated from the weighted average prices of all Treasury bills with maturities less than 365 days.

$$P_{wap} = (P_1 \times V_1 + P_2 \times V_2 + ... + P_n \times V_n) / (V_1 + V_2 + ... + V_n) \tag{4}$$

P = price of a trade realized on the ISE Bonds and Bills Market for

a bond/bill,

V = Total face value of a trade on the ISE Bonds and Bills Market for a bond/bill,

P_{wap} = Weighted average price of that security,

yield of the security = $(1/ P_{wap} - 1) * 365 / c$

c: days to maturity.

2. This information is used to calculate the yield curve. The yields are turned into a function of days to maturity with the regression technique. During this process, a linear regression equation is employed. The market is very narrow in terms of maturity range, so that only 10-15 different maturities are traded daily. In such a market, conducting statistically significant studies to find out an answer to the question of "what kind of function explains the yield curve most likely?" is not reasonable. Nevertheless, the observations and experiences of the author demonstrate that a linear function can explain the market with more than 85% correlation (actually in most cases more than 90%) over the four years with the exception of the crisis. In summary, to protect the reproductibility of indices and to allow making comparisons over the time among index values, it is important to use one certain equation and, for the time being, this equation is linear.

$$y = a c + b \qquad\qquad (5)$$

3. Each day the yields of hypothetical securities are read off the yield curve which is smoothed by the method stated above. Subsequently, these yields are transformed into prices of these hypothetical securities.

a) In order to calculate the Price Indices, the yields of 30, 91, 182 and days to maturity are read off every day and transformed into prices.

b) In order to calculate Performance Indices, the yields of hypothetical bonds which have 30, 91, 182 and 365 days maturity at the base date are found on the yield curve. Days to maturities of these hypothetical bonds are decreased one day, for each subsequent day at which indices are calculated. Again, the yields are found and transformed into prices. While a new hypothetical bond is chosen at the time of redemption of hypothetical bonds/bills, the following rules will be applied:

  i) The maturity date of the new hypothetical bond/bill must be a business day

ii) The maturity date of the new hypothetical bond/bill must not exceed the end of the month, the end of the 3-month and the 6-month periods and the end of the year, for 30-day, 91-day, 182-day and 365-day Performance Indices, respectively.

VI. Base Date and Frequency of Calculation

The indices are calculated on the basis of weighted average prices on each trading day.

The base period of the indices is December 25-29, 1995. The base values are calculated according to above stages. At the beginning of the new year, the base date for the Performance Indices will be changed so that the last week of the previous year will be the base date for the indices of the new year. This creates a comparison opportunity for the Performance Indices with other investment alternatives within the year. However, calculation of the Performance Indices which base date still on 25-29, December, 1995, will be maintained as different series. In order to safeguard the continuity of the Performance Index, the base dates are taken as the maturity date of bonds/bills (hypothetical bonds) as well as the date on which new hypothetical bonds/bills are included in the index while base values comprise the index values on base dates.

VII. Examples of Calculation

Before going through the calculation, a base date has to be chosen for the year 1995. For demonstration purposes, January 2, 1995 is chosen as the base date. The base values are the following:

Table 7.1: Base Values

Maturity Dates of Hypothetical Bond/Bill	Days to Maturity	Price
01.02.95	30	92005,67
03.04.95	91	78168,14
03.07.95	182	61442,06
02.01.96	365	37080,08

Price and Performance Indices were set to 100 at the base date.

For illustration purposes, March 22, 1995 is chosen as the calculation date, arbitrarily. The following statistics were calculated in the regression analysis,

R^2 = 0.987528

t-stat of coeff.   = 35.59,   t-stat of const= 114.48

and the linear equation is

y= 71.08196327+c * 0.137848

y: yield to maturity

c: days to maturity

To calculate the Price Indices, the yields of hypothetical bonds with 30, 91, 182 and 365 days to maturity must be computed using the above equation   subsequently to be converted into prices. As it shall be recalled to create, Performance Indices, four hypothetical bonds with 30, 91, 182 and 365 days to maturity are chosen at the base date and the prices of these bonds are found every day, using the same equation.

Table 7.2: Calculated Values Required for Performance Indices

Days to Maturity	Yield to Maturity	Price
12	72,74	97664,52
12	72,74	97664,52
103	85,28	80602,64
286	110,51	53593,79

Table 7.3 : Calculated Values Required for Price Indices

Days to Maturity	Yield to Maturity	Price
30	75,22	94177,70
91	83,63	82747,71
182	96,17	67588,82
365	121,40	45167,79

The below table shows the values of Indices at March 22, 1995.

Table 7.4: Values of Indices

Days to Maturity	Performance Indices	Price Indices
30	120,9	102,36
91	124,94	105,86
182	131,18	110,00
365	144,54	121,81

Values in the table are calculated in the following way:

7.1. Performance Indices :

Since there are 79 days between January 2, 1995 and March 22, 1995, all hypothetical bonds/bills have maturities 79 days less than that of the original maturities at the base date. Therefore, the prices of 12, 103 and 286-day bills are needed in order to calculate the 30, 91, 182 and 365-day Performance Indices, respectively.

30-day Performance Index:

$$IP_{30} = \frac{P_{12}}{P_{30b}} * IP_{30b} = \frac{97664.52}{93740.67} * 116.09 = 120.95$$

The following special treatment is needed for the 30-day Performance Index :

The 30-day hypothetical bill issued at the base date (January 2, 1995) redeemed at the date of February 1,1995. At this date, a new 30-day hypothetical bill was chosen. The index value calculated at this date was used as a base index for subsequent calculations $(IP30b=108.69)$. This second 30-day hypothetical bill (actually, it is a 28 day bill, because of the last business day of month conversion) also redeemed at March 1, 1995. At that date, the 30-day Performance Index was 116.09 and the price of the new 30-day hypothetical bond was TL 93,740.67. This price will be used as a base value for subsequent 30-day Performance Index calculations untill the end of March 1995. Since we calculate indices for March 22, 1995, the price of 93,740.67 is used as a base value for the 30-day

Performance Index.

91-day Performance Index:

$$IP_{91} = \frac{P_{12}}{P_{91b}} * IP_{91b} = \frac{97664.52}{78168.14} * 100 = 124.94$$

182-day Performance Index:

$$IP_{182} = \frac{P_{103}}{P_{182b}} * IP_{182b} = \frac{80602.64}{61442.06} * 100 = 131.18$$

365-day Performance Index:

$$IP_{365} = \frac{P_{286}}{P_{365b}} * IP_{365b} = \frac{53593.79}{37080.08} * 100 = 144.54$$

7.2. Price Indices :

30-day Price Index:

$$IF_{30} = \frac{P_{30}}{P_{30b}} * 100 = \frac{94177.70}{92005.67} * 100 = 102.36$$

91-day Price Index:

$$IF_{91} = \frac{P_{91}}{P_{91b}} * 100 = \frac{82747.71}{78168.14} * 100 = 105.86$$

182-day Price Index:

$$IF_{182} = \frac{P_{182}}{P_{182b}} * 100 = \frac{67588.82}{61442.06} * 100 = 110.00$$

365-day Price Index:

$$IF_{365} = \frac{P_{365}}{P_{365b}} * 100 = \frac{45167.79}{37080.08} * 100 = 121.81$$

VIII. Historical GDS Indices for 1996 and their Reliability:

Since the beginning of 1996, officially the ISE commenced to calculate

and publish GDS Indices, except those of the 365-day Price and Performance Indices which represented the market in an inefficient manner in the year of 1995 (test year for GDS Indices). The graphical presentation of indices for the first nine months of 1996 and their comparisons with real data can be found in the Appendix.

   As you know, all the indices are calculated using the prices of hypothetical bonds/bills which are derived from the regression equation. In this chapter, these are compared with market prices (again daily-weighted average price) of real bonds/bills. This study has been done by calculating new indices using those "real prices" and the results are shown on graphs together with GDS indices. As it is seen from the graphs, all the GDS Indices could represent their maturity subgroup with a good degree of reliability except for those featuring 365-day indices. Conceivably   lack of the trades on 365-day bonds in the market may have reduced the explanatory power of the regression equation, consequently the justification for such indices.

IX. Miscellaneous Use of GDS Indices:

In the following pages, you will see how GDS Indices could be used by an investor or anyone who would like to depict performance and price movements of the market. In the examples, official values of the indices which covering the first nine- month period of 1996 were used.
   • Price Indices can be used as indicators for changes in bond yields. This is the most direct way of making a scientific use of these benchmarks. When we look at the Price Indices for June 19, 1996, it is seen that the prices of 30-day bills increased by 3.24 %, 91-day bills increased by 8.52% and 182-day bills increased by 13.31% according to the base date. These numbers reveal that the bond yields declined over the first half of the year as our General Price Index supports this conclusion producing an increase of 7.64%. In summary, one can say "bonds are getting more expensive" following the GDS Price Indices. These indices can be compared not only with the base date but also with any previous day. For example, one can say 182-day bills were cheaper on June 19, 1996 than in June 18, 1996, when we compare values of 113.31 and 113.67 representing the 182-day Price Indices on June 19 and on June 18, respectively.
   • The GDS Performance Indices can be used to make comparisons

Figure 7.1: 30-Day Price Indices and Realizations
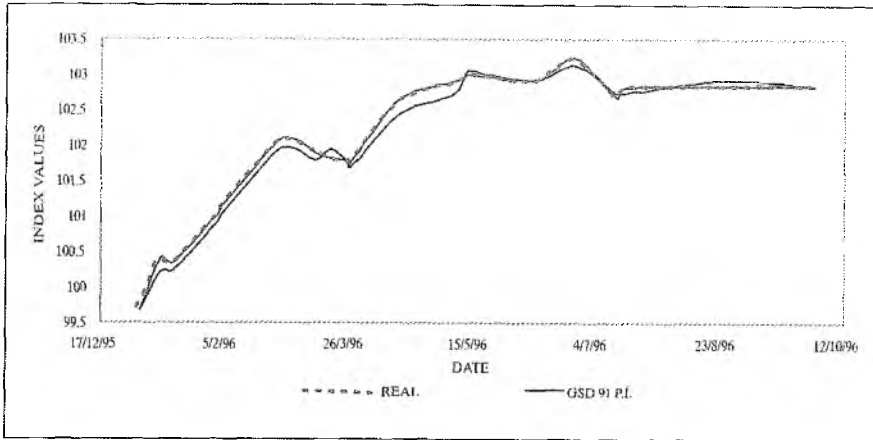
Figure 7.2: 91-Day Price Indices and Realization
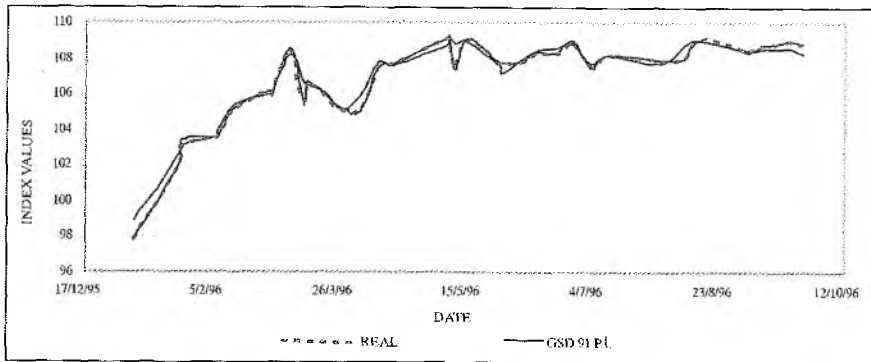
Figure 7.3: 182-Day Price Indices and Realization
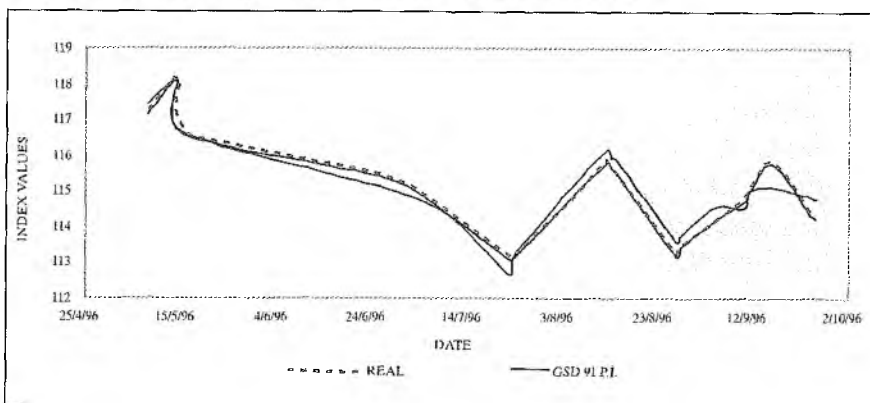
Table 9.1 : End-of-Month Values of GDS
Performance Indices in 1996

	30-day	91-day	182-day
JAN.	109.15	111.74	114.11
FEB.	118.18	122.66	131.13
MAR.	126.34	131.13	138.75
APR.	135.22	142.51	150.79
MAY	145.42	153.92	162.86

Table 9.2 : Cumulative Returns on GDS Performance Indices and
Selected Alternative Instruments

	GDS PERFORMANCE INDICES				STOCK INDICES ISE-100			MUTUAL FUNDS	
	GDS 30	GDS 91	GDS 182	GOLD	FINAN-	INDUST.	COMPO	TYPE A	OTHR
JAN.	9,15	11,74	14,11	8,49	25,78	20,97	21,95	14,48	10,33
FEB.	18,18	22,66	31,13	13,03	60,95	49,03	51,48	32,96	21,14
MAR.	26,34	31,13	38,75	20,33	98,98	58,24	66,64	41,87	28,94
APR.	35,22	42,51	50,79	24,48	86,63	54,15	60,90	44,67	36,70
MAY	45,42	53,92	62,86	30,05	71,10	47,14	52,16	46,38	44,48

among returns on bills and returns on alternative instruments. The following tables and graphs represent how the indices were be used in an accurate manner for comparative purposes.

According to the findings in Table 9.2, an investor choosing to invest in the 30-day bills at the beginning of the year renewing investment every 30 days, got a nominal return of 26.34 % at the end of March 1996 with an inflation-adjusted return estimated at 1.64%. As another investor preferring the 91-day bills at the beginning of 1996 received a 31.13% return, corresponding to a real return of 5.49% in the same period. Similar comparisons can be applied to the period of January-May 1996.

⦾ Since the linear approach was used for the development of indices, linear interpolation method can be employed to construct indices for maturities other than 30, 91 and 182-day standard

terms. Let us take an investor with a different investment horizon whose performance cannot be explained with our indices. Such an investor owns 19-day bills on April 26, 1996. Assuming that the investor acquired a treasury bill with a 134-day maturity at the beginning of the year, the 115 days exist between April 26 and January 2, then maturity of the Treasury bill at the time of purchase must be $115+19 = 134$). Applying straightforward steps of linear interpolation, the return of investment was found as 48.84% for the period of January-April 26. Of course, anybody can measure the realized return on the investment vehicle, using purchase and sale prices. However, what I would like to show is that after, applying certain forecasting techniques to determine the future values of performance indices, anyone can predict the returns for the maturities other than standard. Below, you will find interpolation steps which were implemented terms in order to reach the above result:

1. Performance Indices are $IP_{91}=99.66$, $IP_{182} = 96.92$ at January 2, 1996.

2. 134-day Performance Index at January 2, 1996 must be
   IP_{134} $=(134 - 91)/(182 - 91) * (96.92 - 99.66) + 99.66 = 98.37$

3. Performance Indices are $IP91=142.51$, $IP182 = 150.79$ at April 26, 1996.

4. 134-day Performance Index at April 26, 1996 is
   $IP134$ $=(134 - 91)/(182 - 91) * (150.79 - 142.51) + 142.51 = 146.42$

5. Return on investment for the period of January 2-April 26 is
   $(146.42 - 98.37)/98.37 = 48.84\%$

The result is very near to the realized values. "By mere coincidence", on January 2, a Treasury bill with a 134-day maturity was traded and its weighted average price was realized as TL 66,373 (for TL 100,000 face value). At April 26, the weighted average price of same treasury bill became TL 96,228. The calculated return yielded 44.98 %, just 3.86 points below the above result.

X. Drawbacks of GDS Indices:

The most important detriment of indices originates from the maturity structure of the secondary market. Although more than 80

% of inter-dealer (excluding customer transaction, if we deem that just 25 % of total transactions take place on the ISE) outright purchase and sales transactions conducted on the ISE Bonds and Bills Market, only some popular maturities are traded. This decreases the number of observations which are put into the regression analysis, anchancing its explanatory power. Meanwhile, most of the funds in the market run overnight and the volume of the outright market does not exceed 10% of the total volume of the secondary market for debt securities. Consequently, this situation together with highly volatile interest rates, make it harder to interpret a more reasonable yield curve function rather than the linear one.

There are also some problems attributable the regression method itself. The least square method tries to fit a function by minimizing the discrepancies which is a kind of averaging. In some cases, this reduces the shift on the yield curve. In a worst scenario, the Price Index can show an upward movement in prices as the yields also stage an upswing. In plain words, this situation was observed only once in the past.

Unless securities with a wider spectrum of maturities are traded in the markets with higher amounts, the indices will convey some deficiencies that are attributed to the market itself. Additionally, more suitable and credible yield curve smoothing techniques can be replaced with the regression method.

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B. Technical and Research Reports
1. Salomon Brothers, "Salomon Brothers Fixed-Income Indexes", 1989
2. Federation of German Stock Exchanges, "German Bond Index", REX.

Managing Systematic Risk in Emerging Markets

Gökhan Ugan[*]

Summary

This article examines the adaptability of stock index futures into emerging markets as a systematic risk management tool. First, a risk-return analysis was conducted to determine the level of risk in the emerging markets. As a result of this analysis, emerging markets appeared to be riskier than mature markets. Subsequently, this high risk factor was utilized to explain, by comparing market structure and some financial and economic indicators between emerging and mature markets. Earlier experiences show that stock index futures have some complications at the stage of introduction. In this manner, some important measures envisaged for emerging markets are suggested at the end of this article.

I. Introduction

As global investment alternatives have become widely available, emerging stock markets appear to be an attractive choice in terms of higher returns. For example, stock markets in Hungary, Russia and Venezuela have gained 102.8%, 84.2%, and 78.9% respectively, in US$ terms in just nine months, from December 29, 1995 to October 2, 1996.[1] However, these excessive returns are associated with higher risks, mostly arising from the improprieties of stock markets and instability of their respective national economies As a reliable indicator of economic stability, the inflation rate measured with consumer prices had risen by 114.7% in Venezuela. This risk factor of returns on emerging markets eventually discourages domestic and foreign investors from participating in stock trading

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[1] The Economist, 5 October 1996 issue: Financial and Economic Indicators

activities. Therefore, emerging stock markets are unable to carry out their important role of increasing economic efficiency with improved capital allocation and utilizing and enhancing savings.

In this manner, this study examines the ways of hedging risk arising from the market itself in emerging stock markets. The main objective is to investigate the adaptability of stock index futures into emerging markets as a systematic risk management tool. Accordingly, a risk-return analysis was conducted for 24 emerging and 14 mature stock markets in order to determine how much risk an investor assumes for return in one unit of investment.

Coefficients of variation (CV) were used to calculate the systematic risks of both markets upon weekly returns. The formula of CV is written below[2]:

$$ CV = \frac{\sigma}{\mu} \quad \text{where } \sigma = \sqrt{\frac{\sum_{I=1,n}(k_I - \mu)^2}{n-1}} \text{ and } \quad \mu = \frac{\sum_{I=,n} k_I}{n} $$

In this formula, σ is standard deviation, μ is arithmetic mean, k is the historical rate of return on stock market, and n is the number of observations. Data was obtained from The Economist magazine. According to the results of comparison of stock returns' CVs between emerging and mature markets, emerging markets seem to be riskier than mature markets. To comprehend why returns on emerging markets are higher and riskier, structural differences between emerging markets and mature markets were revealed, based on the data obtained from the World Bank Fact Book. In the light of all this information, the adaptability of stock index futures into emerging markets was discussed.

The structure of mature markets differs from those of emerging ones. Feldman and Kumar (1995) mention that mature markets display some distinctive characteristics such as the role and size of the private sector; access to the market by foreign investors; the role of alternative sources of financing; the institutional setting,

[2] Eugene F. Brigham and Louis C. Gapenski, Financial Management: Theory and Practice. (New York: The Dryden Press, 1994), 150 and 153.

supervision, clearing and settlement arrangements; and the legislative and regulatory framework governing domestic and foreign investment. Not only do emerging markets have weaknesses in terms of dynamic structure, but also they are not well-integrated with the global markets. Harvey (1995) proves this fact referring to the low correlation coefficients between returns on emerging markets and those on mature markets.

Given that emerging markets have less-developed structure and move almost independent from mature markets, introduction of stock index futures in emerging markets appears to be an important concept that must be investigated. In some earlier cases, the introduction of stock index futures led to volatility in stock markets. Lee and Ohk (1992) argue that stock index futures trading increases volatility of the underlying index significantly regardless of the term structure. In a different study, Martin and Senchack (1991) found that systematic risk of the Major Market Index (MMI) and its component stocks significantly increased after the introduction of stock index futures. Consequently, the success of stock index futures in an emerging market depends on making the necessary adjustments referring to their expected effects on the market. Kyle (1988) makes some alternative suggestions. First, he recommends improving ex-ante monitoring and maintaining the equilibrium between the patient and impatient investors. He also suggests the improvement of the computerized system of order entry, increasing the accountability of specialists[3] by opening up their books to the outsiders, and ensuring the ticker to convey more accurate, detailed and up-to-date information. Similarly, Kamara, Miller, and Siegel (1992) call for measures improving liquidity of the stock market instead of further regulations on stock index futures. In addition to these, Rozeff (1990) points out that measures that are supposed to be taken in the U.S. may not be appropriate for another country. However, educating public servants in a way so that they serve the general public instead of some private interest groups and imposing some structural reforms can be used to solve the problem in every country.

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[3] Price stabilizers of stock market.

If the systematic risk were hedged by stock index futures, investors in emerging markets would switch to stock markets, creating a new resource for further national industrialization. Equally important, if applied properly, stock index futures would help emerging markets attract more foreign investment which, in turn, could be used in socio-economic development and world-wide integration.

II. Risk in Stock Markets

Perceived risk may arise from two sources in stock ownership. The first one, the unsystematic risk, or also known as company-specific and diversifiable risk, is unique to a particular company or industry. The frequency and probability of some events that directly affect a specific company or industry determine the degree of unsystematic risk. The second one, the systematic risk, or also known as the market risk and undiversifiable risk, is common among all stocks. Events that affect the economy as a whole, such as inflation, recession, or interest rates also influence almost all stock prices in the same direction but by different proportions. The frequency, consistency and magnitude of this kind of price movements determine the degree of systematic risk. The more frequent, more inconsistent and greater the price movements are, the higher the systematic risk is.

Unsystematic risk can be eliminated by holding several different company stocks from different industries (diversification) since it is unique to a single company or industry. Along with diversification, options on stocks can also be used for the same purpose. However, until the beginning of the 1980s, the most popular way to manage systematic risk had been changing the portfolio composition. After 1982, stock index futures offered an alternative solution to this problem.

Rationally speaking, systematic risk in emerging markets is expected to be higher due to political and economic instability. To see whether this assumption is accurate or not, an analysis was conducted to compare systematic risks per unit between mature and emerging markets. The results of this analysis are summarized in Table 2.1.

Table 2.1: Results of the Risk-Return Analysis

COUNTRY NAME	STOCK MARKETS			CURRENCY			INDEX IN US$			RETURN		
	σ	μ	CV	σ	μ	CV	σ	μ	CV	σ	μ	CV
EMERGING MARKETS												
China	4.50	0.49	9.21	0.11	0.00	46.51	14.63	85.38	0.171	4.48	0.49	9.152
H. Kong	2.45	0.41	5.96	0.05	0.00	0.00	82.35	1390	0.059	2.46	0.41	5.971
India	3.54	-0.09	38.42	1.54	0.12	13.19	8.94	97.69	0.091	4.00	-0.18	22.06
Indonesia	2.55	0.40	6.43	0.28	0.05	5.86	0.02	0.24	0.079	2.64	0.35	7.531
Malaysia	2.24	0.32	7.01	0.40	-0.02	17.85	33.60	428.1	0.078	2.24	0.34	6.518
Philipp.	2.75	0.41	6.77	0.17	0.01	11.36	11.09	111.3	0.100	2.80	0.39	7.106
Singapore	1.92	0.07	29.39	0.37	-0.03	13.97	91.49	1599	0.057	1.96	0.09	21.06
S. Korea	2.91	-0.35	8.23	0.49	0.13	3.75	0.10	1.12	0.094	3.11	-0.48	6.497
Taiwan	3.11	0.55	5.66	0.37	0.05	7.33	24.00	202.6	0.118	3.23	0.50	6.406
Thailand	2.94	-0.35	8.50	0.23	0.02	15.17	4.21	49.29	0.085	2.94	-0.36	8.127
Argentina	3.52	0.60	5.88	0.20	0.00	0.00	56.36	523.9	0.108	3.49	0.60	5.851
Brazil	3.47	0.80	4.35	1.51	0.13	11.84	7164	53085	0.135	3.88	0.70	5.573
Chile	1.43	-0.11	12.77	0.90	0.04	21.62	0.50	13.59	0.037	1.70	-0.15	11.69
Mexico	2.91	0.79	3.68	1.96	0.29	6.82	43.42	397.1	0.109	4.11	0.56	7.336
Venezuela	6.90	3.29	2.10	12.99	2.56	5.08	1.58	9.29	0.170	10.72	1.72	6.225
Greece	1.94	0.10	19.06	0.78	0.06	13.07	0.14	3.90	0.036	2.06	0.05	43.43
Israel	2.94	-0.12	23.94	0.80	0.11	6.94	3.71	62.55	0.059	2.94	-0.23	12.55
Portugal	1.11	0.25	4.39	0.91	0.05	16.66	0.85	17.65	0.048	1.13	0.20	5.573
S. Africa	1.82	0.43	4.25	1.69	0.41	4.11	117.2	1627	0.072	2.81	0.05	52.74
Turkey	5.61	1.18	4.73	0.92	1.23	0.75	0.09	0.82	0.105	5.69	-0.03	201.4
Czech R.	9.37	-0.85	11.03	0.89	0.05	18.93	13.69	29.46	0.465	2.89	0.69	4.208
Hungary	4.42	1.64	2.69	1.30	0.30	4.29	4.29	16.80	0.255	4.46	1.34	3.325
Poland	4.54	1.12	4.05	0.66	0.32	2.05	718.2	4245	0.169	4.45	0.79	5.603
Russia	7.60	1.70	4.46	0.34	0.36	0.92	0.01	0.04	0.336	7.51	1.33	5.638
Average			9.707			10.33			0.127			19.65

Gökhan Ugan

Table 2.1 - Results of the Risk-Return Analysis

COUNTRY NAME	STOCK MARKETS			CURRENCY			INDEX IN US$			RETURN		
	σ	μ	CV	σ	μ	CV	σ	μ	CV	σ	μ	CV
MATURE MARKETS												
Australia	1.66	0.17	9.65	1.06	-0.07	15.28	80.44	1715	0.047	1.95	0.25	7.752
Austria	24.20	3.53	6.85	0.90	0.12	7.82	32.15	78.32	0.411	1.92	-0.06	30.64
Belgium	1.70	0.40	4.19	0.95	0.12	8.07	2.50	54.32	0.046	1.60	0.29	5.519
Britain	1.26	0.26	4.88	0.93	0.03	26.91	179.9	5753	0.031	1.55	0.23	6.647
Canada	1.36	0.36	3.81	0.59	0.04	13.25	170.6	3622	0.047	1.62	0.32	5.104
Denmark	1.04	0.36	2.89	0.90	0.10	9.19	2.82	68.51	0.041	0.93	0.26	3.523
France	1.65	0.35	4.75	0.84	0.08	10.13	13.05	265.2	0.049	1.46	0.27	5.501
Germany	1.61	0.39	4.17	0.97	0.12	7.97	62.29	1645	0.038	1.41	0.27	5.283
Italy	2.51	0.10	24.24	0.65	-0.13	5.15	0.03	0.39	0.065	2.73	0.24	11.54
Japan	1.95	0.35	5.64	0.98	0.20	4.94	8.87	193.5	0.046	1.88	0.15	12.49
Spain	7.12	0.63	11.35	0.90	0.07	13.89	0.17	2.70	0.064	7.13	0.57	12.58
Sweden	1.91	0.30	6.43	1.24	-0.10	12.39	19.05	279.5	0.068	2.20	0.41	5.368
Switz.	1.74	0.42	4.15	1.23	0.15	8.10	122.7	2878	0.043	1.81	0.28	6.553
U. S.	3.14	0.48	6.57	0.00	0.00	0.00	361.5	5448	0.066	3.14	0.48	6.575
Average			7.112			10.22			0.076			8.935
World	1.20	0.25	4.80	0.00	0.00	0.00	27.31	749.3	0.036	1.20	0.25	4.801

According to the results, on a weekly basis, investing in emerging markets is twice as risky as in mature ones in terms of US$. The average of emerging markets' CVs for the period from October 3, 1995, to October 2, 1996, is 19.65 (CVM$) whereas the same figure for mature markets is 8.935 (CVE$). CVs for all markets are depicted in Figure 2.1.

Figure 2.1: Stock Market Risk Comparison (US$)
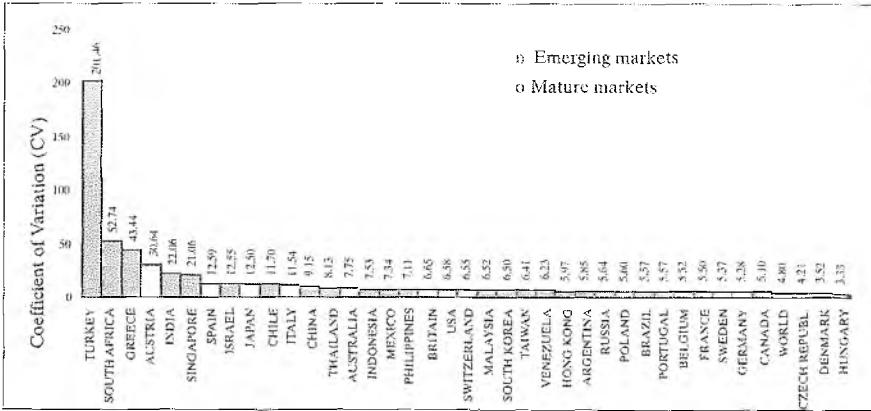
However, the average systematic risk (CV) for emerging markets in terms of local currency is 9.707 (CVML) and for mature markets is 7.112 (CVEL). The results of risk-return analysis in local currency terms are shown in Figure 2.2.

Figure 2.2 : Stock Market Risk Comparison (Local Currency)
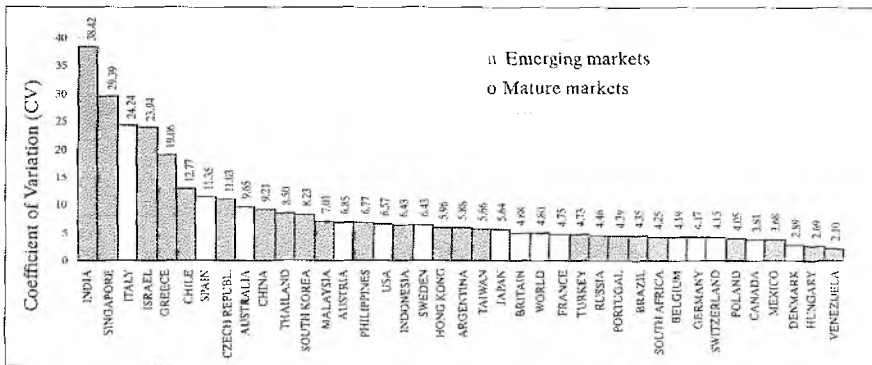
In the first case, the rate of average systematic risk of mature stock markets in US$ terms to that of emerging markets is 2.2 [CVM$/CVE$]. However, in the second case, the same rate is 1.4 [CVML/CVEL]. The difference between the two rates stems from the exchange rate risk. In other words, local investors are exposed to a lesser risk than foreign investors. The exchange rate risk is depicted in Figure 2.3 for mature and emerging stock markets in terms of standard deviation.

Figure 2.3: Exchange Risk Comparison
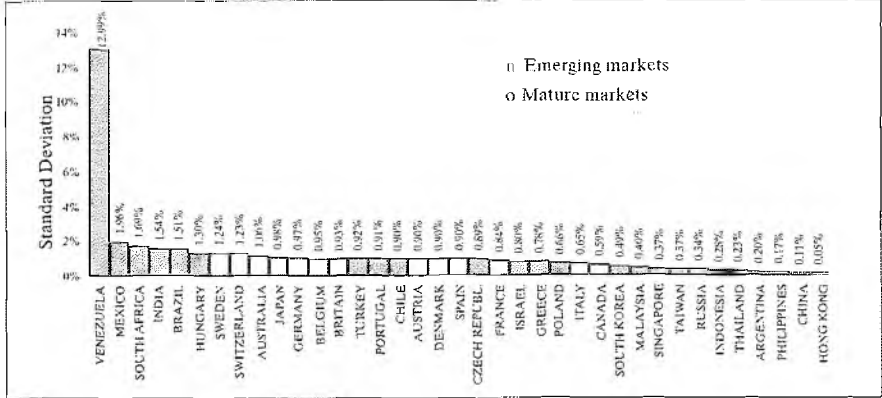
II. Structure of Emerging Markets

The results of the analysis show that emerging markets have a different structure, causing a higher systematic risk. Thus, understanding the differences between emerging and mature markets makes reaching a decision about the suitability of stock index futures application in emerging markets easy.

Emerging stock markets exhibit different structural characteristics from mature markets. In most mature markets, the institutional setting is conducive to broad-based investor confidence and competitive trading, liquidity and trading activity tend to be very high, market breadth is substantial, the private sector is dominant in the economy, information is widely available and reporting and disclosure standards are high. On the other hand, emerging markets' characteristics vary from one to another. Feldman and Kumar (1995) classify emerging markets under four groups.

The first group consists of countries with markets in the early stages of development, with few quoted companies, small capitalization, high concentration, low liquidity, high volatility and a comparatively rudimentary institutional setting. Hungary and Poland are convincing examples of this category.

In the second group, the market liquidity and the number of quoted companies are higher. Foreign investors are aware of the investment opportunities in these countries; however, their investments are in small amounts. The equity market is still small

relative to the economy, but the corporate sector has begun to rely increasingly on equity financing. Brazil, China, India, the Philippines and Turkey are examples of this group.

In the third group, the market returns are less volatile, trading activity and the volume of shares issued increases rapidly, capitalization expands considerably and there is more interest in developing mechanisms to transfer risk, such as equity and currency hedging instruments. Argentina, Indonesia, Malaysia and Thailand fall into this group.

The fourth group involves more mature markets in which liquidity and trading activity are very high, market breadth is substantial and the equity-risk premiums[4] are close to internationally competitive levels. This group includes countries

Table 3.1 - Capitalization Rates

Country	1983	1993	Differ.	Country	1983	1993	Difference
Emerging Markets				Thailand	3.8%	105.5%	101.7%
Argentina	1.3%	17.2%	15.9%	Greece	2.9%	13.8%	10.9%
Brazil	7.4%	20.6%	13.2%	Portugal	0.5%	14.6%	14.1%
Chile	13.2%	102.1%	88.9%	Turkey	2.0%	30.2%	28.2%
Mexico	2.0%	55.5%	53.5%	Average Change			76.2%
Venezuela	3.5%	13.6%	10.1%	**Mature Markets**			
Hong Kong	70.8%	350.8%	280%	Canada	42.8%	59.2%	16.4%
S. Korea	5.3%	42.1%	36.8%	France	7.2%	36.4%	29.2%
Philippines	4.3%	75.0%	70.7%	Germany	12.6%	25.9%	13.3%
Singapore	89.2%	254.3%	165.1%	Italy	5.0%	13.7%	8.7%
Taiwan	14.5%	90.2%	75.7%	Japan	47.6%	71.2%	23.6%
India	3.5%	44.8%	41.3%	Britain	48.9%	121.7%	72.8%
Indonesia	0.1%	23.1%	23.0%	U.S.	55.7%	82.4%	26.7%
Malaysia	76.1%	341.9%	265.8%				
				Average Change			27.2%

Source: Feldman and Kumar (1995), 183.

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[4] Risk-adjusted returns relative to short-term money market interest rates.

such as Hong Kong, South Korea, Mexico, Singapore and Taiwan.

In addition to differences among one another, emerging markets also display some similarities. First of all, market capitalization has been continuously increasing in large amounts. The differences between capitalization rates to GNP in 1983 and 1993 are shown in Table 3.1 for some emerging and mature markets mentioned in this study.

According to these results, the capitalization rate to GNP had increased in emerging markets on average almost three times as much as that in mature markets. Feldman and Kumar (1995) note that this increase stems mostly from new listings.

Feldman and Kumar also point out the important role of equity finance for emerging markets in the growth of new assets. Equity issuance accounts for more than a third of the increase in net assets of large firms in emerging markets whereas this ratio is only 5% for companies in mature markets.

Harvey (1995) concludes that emerging markets are not well integrated with the global markets, referring to the low correlation coefficients between returns on emerging markets and those on mature markets. Demirgüç and Huizinga (1995) explain this lack of integration with the portfolio investment barriers in emerging stock markets. The main disadvantage of investing in those markets is the taxation on capital gains and dividends going to the foreign investors.   The trend in emerging markets is toward lowering dividend taxes and maintaining the current level of taxes on capital gains. This trend is the opposite of what appears optimal.

Furthermore, according to Richards (1996), short-term returns in emerging markets are found to be auto-correlated. This auto-correlation may exist due to either insider trading by market participants who have privileged information compared with to others or uninformed traders such as foreign investors who have little information. Therefore, along with the weak regulatory environment, inadequate information dissemination causes some improprieties such as insider trading and manipulation in emerging markets.   In most emerging markets, information systems are available to only a limited number of people--in most cases, traders.

Finally, Claessens, Dasgupta, and Glen (1995) find in their study that emerging markets do not exhibit some anomalies such as

turn-of-the-year effect, small firm effect, and relationship between seasonal effect and the size effect that exist in most mature markets. However, they are characterized by high volatility and pricing inefficiencies, infrequent trading and speculative bubbles.[5]

A comparison of average financial and economic data may help to understand why returns on emerging markets are higher but riskier.

Table 3.2 - Financial and Economic Indicators

Indicator	Mature Markets	Emerging Markets	Indicator	Mature Markets	Emerging Markets
Consumer Prices	1.9%	18%	Money Supply	3.6%	30.5%
Employment	-3.7	11.5	Interest Rates	4.5%	19.67%
Current Account	-0.6	-2.9	Currency Unit	2.91%	17.81%
Ind. Production	1.4%	4.1%	Pri. Cons.	60.4%	61.8%
Govern. Deficit	-4.44%	-1.58%	GDP Per Cap.	23207	4950

Source: The World Bank Fact Book (1995) and The Economist, 2 November 1996: Financial and Economic Indicators.

In this table, consumer prices, annual change in industrial production, current account (billion $), interest rates, and annual change in currency units represent data perteining to 1996 whereas employment index (1987= 100), the rate of goverment deficit to GNP, annual change in money supply, the rate of private consumption to GNP, and GDP per capita represent data for 1992.

Accordingly, higher industrial production and employment level, excess money supply, real interest rates, as well as an appreciated currency explain higher returns in emerging markets. However, high inflation, a bigger gap in the current account, and low GDP per capita lead to a volatility in these markets.

IV. Effects and Policy Concerns of Stock Index Futures Introduction
So far, several studies have examined the effects of stock index futures introduction. Although some findings are contradictory, most agree that the effects of stock index futures depend on the structure of the market in which the stock index futures are

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[5] High prices occur because of the belief in further increases in prices, not because of the improvement in the companies' financial positions.

introduced. In this section, the common effects of introducing stock index futures to the stock market are discussed.

The most argued effect is whether stock index futures increase the volatility of the stock market. Kamara, Miller, and Siegel (1992) found that the volatility of daily returns increased after the introduction of stock index futures while the volatility of monthly returns remained unchanged. Therefore, investors are not adversely affected. Lee and Ohk (1992), however, concluded that stock index futures increased the volatility of the underlying index significantly regardless of the term structure. In conclusion, Kamara, Miller, and Siegel argue that no evidence was found supporting the theory that stock index futures had an adverse effect on market stability in the long-term. Indeed, stock index futures increase social welfare with their hedging benefits. Similarly, Lee and Ohk suggest that the introduction of stock index futures may lead to a change in the speed of information flow to the stock market. This effect removes the short-term auto-correlation of stock prices that stems from the inadequate information flow. Thus, although its volatility increases, the stock market becomes more efficient since the volatility shocks are quickly assimilated in the market. Price stabilization mechanisms (e.g., specialists, price limits) may also reduce the volatility caused by stock index futures.

Another effect of stock index futures is the liquidity effect. After the introduction of stock index futures, uninformed investors would switch to futures markets while informed investors would invest in individual stocks. If this migration occurred, the ask-bid spreads of stocks would become wider compared to the pre-futures period. The migration theory is suggested by Jegadeesh and Subrahmanyam (1993) to support the liquidity effect. According to their study, average proportional spread in the stock market had increased subsequent to the introduction of stock index futures.

Stock index futures also increase systematic risk. Martin and Senchack (1991) found that the systematic risk of the MMI and its component stocks significantly increased after the introduction of stock index futures trading. In addition, an increase in average correlation among index stocks was observed. However, stocks that were not included in the index did not exhibit similar characteristics.

The introduction of the Hang Seng Index stock futures contract can be given as an example of the effects of stock index futures on emerging markets. The first observed event was the mispricing of the futures contracts. According to Yau, Schneewers, and Yung (1990), this mispricing could be explained by three possibilities. First, non-synchronous trading and reporting of data could lead to mispricing. Second, being forbidden from short selling in the stock market and high transaction costs could discourage arbitrageurs to operate in these markets. Once arbitrageurs are non-existent in the futures market, mispricing does occur. The third reason is the over-optimism about the bullish market. This anticipation creates excess demand for index futures and leads to mispricing. Freris (1990) also found that, although the inter-day and intra-day volatility of the market rose in some amounts, the introduction of stock index futures trading in Hong Kong had no measurable effect on the stock price volatility. This can be explained by the trend of the bull market when stock index futures were introduced. Freris also concluded that the greater the volume of trading, the greater the daily changes and spreads.

When the October 1987 market crash occurred, the foremost culprit was identified as stock index futures. The general assumption was that the inadequate margin requirements created an adverse effect on the stock market just as margin buying contributed to the market crash in October 1929. Therefore, regulatory institutions felt responsible about the crash and attempted to impose some restrictions on stock index futures trading. The same measures were taken in Japan in 1991 due to overvaluation of stock index futures. Authorities raised margin requirements for futures investors to 7% in cash and 13% in shares and brought in limits on how far futures contracts can move in one day because they feared that unwinding of the arbitrage deals would unleash a downward spiral, as happened twice during 1990.[6] Also, in 1992, the Japanese Ministry of Finance has imposed higher trading limits and higher commissions on futures to reduce their unfavorable effect on the stock market.[7]

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[6] "Tokyo Stockmarket: Futures Imperfect," The Economist 9 February 1991,p.87.
[7] "Stockbrokers in Japan: Goodbye to All That," The Economist 12 December 1992, pp. 88-89.

However, several studies proved that stock index futures did not cause the market crash by themselves. Antoniou and Antonious (1993) found that the initial source of the problem was the inability of liquidation in the stock market. This liquidity problem drove sellers from the stock market to the futures market and caused the arbitrage link to break down. The outcome was a downward spiral in prices in both markets.

In addition to this, the ticker did not provide accurate and up-to-date information on that day, and this caused the link between the two markets to collapse. Also, the computerized system of order entry became so congested that traders could not trust it to provide prompt execution. Moreover, index futures arbitrageurs felt that the other party of the trade would not fulfill obligations and this accelerated the panic.

Generally, there is no need to introduce further regulations on stock index futures; however, the possible consequences of comprehensive regulations are also discussed. Kyle (1988) defines two important types of investors. The first one is impatient investors. They induce price fluctuations and create trading volume. The second one is patient investors. They provide depth to the market by stabilizing prices by buying when impatient sellers push prices down and selling when impatient buyers push prices up. If margin requirements are increased drastically, the access to the order entry system is restricted, and punitive taxes are imposed on positions held for the short periods of time. The impatient investors will quit the market due to high costs of transaction. However, in the long-run, patient investors will also quit the market because impatient investors are the source of profit for the patient investors. The result will be a smaller and less liquid, but not necessarily, more stable market.

As mentioned among the measures to be taken, broadening conditions of trading halts was found to have some adverse consequences. According to Fortune (1993), the first one is that, if they are imposed, investors will want to pay lesser prices but require higher yields because the market will lose its liquidity. The second one; trading halts can become self-fulfilling. If investors anticipate a trading halt, their transactions will eventually result in a trading

halt. The third one; if a trading halt occurs, traders will try to close their positions in the stock market, and this will worsen the situation. Thus, when the transactions are stopped in futures markets, it must also be stopped in the spot market.

V. Conclusion

This study examines the possibility of eliminating systematic risk in emerging stock markets to appreciate their higher returns. Among the contemporary systematic risk management techniques, stock index futures were chosen as the most appropriate ones for emerging markets because they are the first developed and most experienced risk management tools in mature markets. However, stock index futures are inefficient to eliminate the systematic risk entirely because they only facilitate the risk transfer between two individuals with different expectations; a certain amount of risk will remain. That is why they are very practical in eliminating or reducing the systematic risk arising from the stock market volatility but not functional when the market movements are heading to one direction. Experiences such as the market crash in 1987 show that, if the stock market is inefficient, stock index futures even worsen the situation when expectations are similar. In that sense, they are ineffective to eliminate the political and regulatory risk of emerging markets.

Consequently, implementing stock index futures is suggested for emerging markets in order to manage the systematic risk arising from the market volatility. However, some certain stages must be accomplished before introducing the stock index futures trading.

Governments of emerging markets should not limit regulations that are necessary to correct the market failures and not interfere in the development of the market.

To ensure liquidity and price efficiency in the market, the microstructure (trading structure) of emerging markets should be improved by upgrading settlement and clearance procedure, removing barriers to the dissemination of information and increasing the capability of the electronic trading system.

In addition to microstructure alignments, the regulatory environment should also be tightened. First, a market surveillance

system must be set up to determine excessive speculation, manipulation and insider trading, which can destabilize the stock market. Second, legal provisions and means to enforce them have to be instituted to prohibit these actions. Third, inadequate information dissemination, accounting and reporting standards should be improved, and the procedure of new listings should be simplified though disclosure requirements ought to be increased. Fourth, transaction fees should be reduced in order to attract more investors.

Given that stock index futures increase volatility, some measures, such as privatization, must be taken to reduce the fluctuations. Furthermore, participation of foreign investors also reduces volatility in the stock market. Thus, restrictions on foreign investment should be eliminated or, at least, reduced by lowering or removing dividend and capital gains taxes. Establishing a specialist system like in the U.S. would also be necessary especially for absorbing adverse consequences of accelerator and expiration effects of stock index futures.

After the improvement of the stock market, examining the index structure comes next. The components of the underlying index should have equal capitalization weights and a high number of outstanding shares. If the current index does not involve these characteristics, then a new index should be constructed to be used as the underlying asset of stock index futures.

Accomplishing these stages is very important because there must be a good cash market price or index value that is uniform and freely available throughout the market as well as accurate and manipulataion-immune cash settlement system to work properly. Emerging markets must also be careful in identifying investors and arbitrageurs as well as their trading activities, determining position limits and margins appropriate to the stock market's structure. Investors, traders and arbitrageurs must be educated in a way that should posses a clear conception about what the trading procedure of stock index futures is.

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Analysis of Factors Affecting the Performances of Turkish Financial IPOs

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Abstract

In this paper, I analyze empirically the factors affecting the performances of the Turkish financial initial public offerings (IPOs). The sample consists of 39 financial firms listed and traded on the Istanbul Stock Exchange during the period of 1990-1995. The initial trading day raw and the market adjusted returns are 14.6% and 15.3% respectively. The investigation of factors influencing the initial performance reveals that the rising market between the fixing of the offering price and the first trading day, the standard deviation of market-adjusted returns of IPOs during the first 30 trading days, are found to be highly significant determinants of underpricing. Furthermore, the size of the proceeds generated from the public offering and the self-issued offerings variables are found to be weak determinants of initial underpricing.

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I. Introduction

Firms operating in relatively less developed capital markets or firms under a certain size are most likely to obtain their financing through internal sources or external borrowing. This type of financing is also a cause of mismatch between the sources and uses of funds; hence, this phenomenon increases financial risks of firms. Initial Public Offerings (IPOs), as a relatively new source of financing in the Turkish Capital Market, have been used more often in recent years in addition to the traditional financing methods of borrowing and internal financing. The IPOs' proceeds between 1990-1995 have been over 2.2 billion U.S. dollars.[1]

For firms possessing a certain size, the raising of funds internally or borrowing from the money market may not be sufficient or may be prove costly which will direct firms to seek alternative sources of financing. This provides an opportunity for the development of the Turkish Capital Market. Furthermore, the persistent government budget deficit and high inflation have been influencing negatively the financial structures of firms. The main source of public budget deficit financing is through public borrowing, more specifically borrowing from banks. This reduces the amounts of funds available for firms through commercial banks and increases the cost of borrowing. At this stage, firms have become aware of another way of financing, namely Public Offerings which have been widely used in developed capital markets. One of the important issues of IPOs is the level of returns obtained by investors.

Several studies have examined the performances of Initial Public Offerings (IPOs) in different markets. The results of these studies generally encompass the existence of positive initial returns (underpricing). More recently long-run performance (up to three years) of IPOs have been documented. While some of the results show significant underperformance in years subsequent to listing, others find the persistence of initial overperformance. Studies on the performances of Turkish IPOs indicate the existence of significant initial underpricing. For example, Kıymaz (1996a) and

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[1] During the same period, financial firms going public have raised approximately 8.265 trillion TL. This is equivalent to approximately 800 million U.S. dollars.

(1996b) report that the market-adjusted abnormal returns are 15.3% for financial IPOs and 12.2 % for industrial IPOs on average.

The purpose of this paper is to investigate the factors influencing the performances of Turkish financial IPOs and to test some of the hypotheses of underpricing suggested in the literature. The remainder of the paper proceeds as follows. In section 2, the prior international evidences on IPOs are reviewed. While the data descriptions along with the definitions of selected variables intended to explain underpricing are presented in section 3, the cross-sectional explanations for initial IPOs' performances are outlined in section 4. Finally, section 5 summarizes and concludes the paper.

II. International Studies on IPOs

The performances of IPOs are investigated extensively in several markets and these studies are outlined in Table 1. A number of studies investigating the performances of IPOs report the existence of short-run underpricing (Ritter (1991), McGuiness (1992), Lewis (1993), Kunz and Aggarwal (1994), Kim, Krinsky and Lee (1995), Lee, Taylor and Walter (1996)). However, there exists a disagreement among studies with respect to performances of IPOs in the long run. While some studies report the persistence of underpricing in the long run as well, others report no significant positive abnormal returns, or in some cases, negative abnormal returns in the long run.

The performances of IPOs are widely analyzed in the U.S. Among these studies, Ritter (1991) investigated 1,526 IPOs of common stocks during the period of 1974-1985. While the initial underperformance was found to be 14.3%, three-year control sample adjusted returns were reported to be -29.1%. These results indicate that, in the long-run, IPOs underperformed. The results of Aggarwal and Rivoli (1990) research are also in line with Ritter (1991) and show an initial underpricing of 10.7 % and an average underperformance of -13.7% in the long run for a sample of 1,598 firms.

**Table 1: Summary of Previous Studies on Short-run and
            Long-run IPOs' Performances**

Study	Country	Sample Period	Number of Firms	Market Performance (%)	
				Short-run[a]	Long-run[b]
Lee, Taylor and Walter (96)	Singapore	1973-92	132	31.4*	8.0
Lee, Taylor and Walter (96)[d]	Australia	1976-89	266	11.8*	- 51.0*
Kim,Krinsky and Lee (95)	Korea	1985-89	169	57.5*	91.6*
Kunz and Aggarwal (94)	Switzerland	1983-89	42	35.8*	32.5
Lewis (93)	UK	1980-88	712	14.3*	-11.4*
Aggarwal,Leal and	Brazil	1980-90	62	78.5*	-47.0*
Hernandez (93)	Chile	1982-90	36	16.3	-23.7
	Mexico	1987-90	44	2.8	-19.6
McGuiness (92)	UK	1984-88	92	16.6*	-
Keasey and Short (92)	UK	1984-88	222	14.0*	-
Ritter (91)	USA	1975-84	1,526	14.3*	-29.1*
Aggarwal and Rivoli (90)	USA	1977-87	1,598	10.7*	-13.7*
Jog and Riding (87)	Canada	1971-83	100	9-11.5*	-
Dawson (87)	Hong Kong	1978-84	21	13.8	-9.3
	Singapore	1978-84	39	39.4	-2.7
	Malaysia	1978-84	21	166.6	18.2*
Güzelhan and Agar (91)	Turkey	1989-91	Mar.36	2.6	-
Kıymaz (96)[c]	Turkey	1990-95	39	15.3*	-9.3e
Kıymaz (96)[d]	Turkey	1990-95	88	12.2*	-2.5e

a: Short-run returns generally refer to the first day returns.

b: Long-run results are exclusive of first day returns.

c: Includes only financials.

d: Includes only industrials.

e: These studies include only five-month periods and, since the results are not
   statistically significant, they should be interpreted cautiously.

*: significant at least 5% level.

While the initial underpricing of IPOs is confirmed universally, the long-run performance results are mixed. Dawson (1987) investigates both short and long-run performances of IPOs in Hong Kong, Singapore and Malaysia during the period of 1978-1983. While there exists initial underperformance in Hong Kong and Singapore, the long-run performances are negative, relative to market returns. Only Malaysian IPOs have underpricing both in the short and long runs.

Jog and Riding (1987) examine underpricing of Canadian IPOs by analyzing 100 IPOs during the 1971-1983 period. The results show that the average underpricing ranged form 9% to 11.5% and underpricing was significantly related to the trading volume business sector of firm and the use the of funds from the offering.

Keasey and Short (1992) investigate the level of underpricing of IPOs in the U.K. The level of underpricing was 14 % and related to few variables. Specifically, the level of underpricing was markedly related to the amount of money raised on flotation and the presence of earnings forecast.

Aggarwal, Leal and Hernandez (1993) examines the performances of IPOs in both short-and long-run terms, based on a sample of 62 Brazilian IPOs, 36 Chilean IPOs and 44 Mexican IPOs. Results indicate that initial one-day returns are found to be 78.5%, 16.3% and 2.8 % for Brazil, Chile and Mexico, respectively. Long-run mean market-adjusted returns are -47.0 % in Brazil and -23.7 % in Chile and -19.6 % in Mexico.

Lewis (1993) reports average first day return of 14.3 % for 712 UK IPOs   during   the   period   of   1980-1988   and   long-run underperformance of -11.4 % after three years.

 Kunz and Aggarwal (1994) examine the IPOs at the Swiss stock market by examining a sample of 42 firms going public between 1983 and 1989. The result indicates an average initial return of 35.8 %. The long run returns, inclusive of initial returns, remain well above 30% up to three years following IPOs.

Kim, Krinsky and Lee (1995) investigate Korean initial public offerings of 169 firms during the period of 1985-1989. The results reveal that the Korean IPOs outperform seasoned firms with similar characteristics. The average underpricing was found to be 57.5% on

the initial day and 59.1% in the long-run.

Lee, Taylor and Walter (1996) analyze both initial underpricing and post-listing returns of 266 Australian industrials during the period of 1976-1989. The results show that the Australian IPOs significantly overperform the market initially by 11.8% but underperform market movements in the three-year period subsequent to listing by -51 %. Lee, Taylor and Walter (1996) also focus on initial and long-run returns for Singaporean IPOs. They report initial returns of 31.4 % in the short-run and 8% in the long-run.

Studies on Turkish IPOs' performances have the following findings: Güzelhan and Ağar (1991) investigate 36 firms going public in the period of 1989 and March 1991. The results indicate the existence of 2.6% underpricing on the initial trading day.

Kıymaz (1996a) and Kıymaz (1996b) investigated the performances of Turkish financial and industrial IPOs respectively in the period of 1990-1995. Kıymaz (1996a) reports an initial market-adjusted abnormal return of 15.3% for financial IPOs. The market-adjusted abnormal returns for sub-groups of financials are reported to be 20.9% for banks, 10% for insurance, 5.5% for leasing/factoring and 18.5% for holding/investment trust sub-groups. All results are statistically significant with the exception of banks. When the after-market returns, following the initial trading day are investigated, the positive initial trading day returns are mostly replaced by negative returns. For all financials, the cumulative abnormal returns (excluding initial day returns) at the end of the fifth month are -9.3 %. For banks, insurance and leasing/factoring groups, the cumulative abnormal returns at the same period are -20.8%, -38.3% and -27.8%, respectively. On the other hand, holding/investment trust group continues to have positive cumulative abnormal returns of 20.4%. Among them, only the insurance group results are statistically significant.

Kıymaz (1996b) reports an initial market-adjusted return of 12.2% for industrial IPOs. The market-adjusted initial returns for sub-groups of industrials are found to be 11.4% for food/beverage, 8.7% for textiles/apparel, 18.8% for paper/publishing, 16.4% for chemical/petroleum, 12.9% for mineral products, 13.1% for basic

metals and 8.2% for machinery/equipment groups. All results are statistically significant. In the after-market period of five months, however, there are differences with respect to IPOs' performances of groups. For all industrials, the cumulative abnormal returns are -2.5% at the end of fifth month. The positive after-market performances continue to exist for food/beverage, textiles/apparel, chemical/petroleum and mineral products groups. On the other hand, paper/publishing, basic metals and machinery/equipment groups have negative after-market performances. Among them, only the results of paper/publishing, chemical/petroleum and machinery/ equipment groups are statistically significant.

In summary, the international studies on IPOs can be classified into two groups. While almost all studies consistently find short-term underpricing, indicating the existence of abnormal returns to investors, there exist mixed results for long-term performance, with many countries showing underperformance. Hence, evidence for long-run performance is not conclusive.

III. Data and Short-run Evidence of Underpricing

3.1. Data and Variables
The sample consists of 39 financial firms that launched initial public offerings and subsequently listed on the Istanbul Stock Exchange (ISE). The financial firms are classified under four sub-groups: banks (10), insurance (7), factoring/leasing (7) and holding/investment trusts (15). Of the 39 IPOs', in 1990, 9 IPOs, in 1991, 4 IPOs, in 1992, 3 IPOs, in 1993, 5 IPOs, in 1994, 6 IPOs and in 1995, 12 IPOs were offered to the public. The date of going public, offer price, number of shares offered, price series for firms and the ISE Composite Index, firms' balance sheet and income statements and other related information were obtained from the ISE or its publications. During the period of 1990-1995, 8.265 trillion TL was raised by 39 financial firms .[2]

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[2] This amount reflects the nominal proceeds. It may be more meaningful to express gross proceeds in terms of U.S. dollars. Such proceeds equal to approximately 800 million dollars.

Table 2 incorporates the description of data. Panel A of Table 2 reports statistical description of Kıymaz (1996a) findings regarding the initial trading performance of Turkish financial IPOs. Accordingly, the raw returns for all financials are 14.6% and market-adjusted abnormal returns are 15.3%.[3] The market adjusted abnormal returns are used as dependent variable in regression analysis.

There are several hypotheses regarding the possible explanations for IPOs. Generally, the literature on underpricing relates the underpricing phenomena to ex-ante uncertainty (Beatty and Ritter (1986), Rock (1986)). In line with these studies, a positive relationship between the level of underpricing and the ex-ante uncertainty of a new issue is expected. Since it is not possible to measure ex-ante uncertainty directly, a number of variables are used as proxies. These include the size of firms, the gross proceeds, market conditions, operating history of firms, percentage of equity offered to the public, the standard deviation of daily stock returns and the method of going public. On the Panel B of Table 2, the descriptive statistics of variables, which have been suggested as potential explanators of cross-sectional differences in initial underpricing, are outlined. These are:

Total Asset (ASSET)
The larger firms may have less uncertainty regarding the performances of firms. The size variable is employed to capture the possibility that small IPOs are more speculative than larger IPOs. Hence, larger IPOs are expected to have lower uncertainty in comparison to smaller IPOs. The average asset size of financials is 1,082.3 billion TL. This variable is measured as the natural logarithm of total asset value at the end of the preceding year to the year of going public. Accordingly, the variable has an average value of 5.83, minimum value of 1.82 and a maximum value of 8.84.[4] A negative coefficient is expected for this variable.

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[3] For each firm, the raw returns are calculated by using (Pi,t /Pi,t-1)-1 formula, where; Pi,t-1 is the offer price and Pi,t is the closing price on the first troding day. Abnormal returns are defined to be raw returns minus corresponding market return. ((Pi,t /Pi,t-1)-1- Ri,t). The ISE Composite Index is employed as the market return.

[4] The asset size is also measured by using the year- end TL/$ exchange rate and similar results may be obtained.

Operating History (AGE)

The operating history of the firm, prior to going public, is also employed as proxy for ex-ante uncertainty. Since older firms have more public information available than younger firms, the older firms are expected to have lower ex-ante uncertainty compared to younger firms. Hence lower underpricing is expected for older firms. The age of the firm in years on flotation is used as variable and is expected to be inversely related to the level of underpricing. The average age of the firms is found to be 15.89 years.

Gross Proceeds (PROCEEDS)

The size of gross proceeds may provide some information about performances of IPOs. Smaller IPOs may be more speculative compared to larger IPOs. Hence, uncertainty may be higher for smaller IPOs. The natural logarithm of the gross proceeds in U.S. dollar terms is used as variable. The average gross proceeds are 24.686 million dollars. The variable is expected to be inversely related to the level of underpricing.

Market Trend (MARKET)

The underpricing of initial public offerings may be the result of a rising stock market between the fixing of the offer price and the first trading day. In order to measure the effects of the rising market on IPOs' performances, the ISE Composite Index is employed. Specifically, movements in the ISE Composite Index returns in 30 days prior to first trading day are used as explanatory variables. The average, minimum and maximum values of this variable are 0.08, -0.14 and 0.46, respectively. A positive relationship between the variable and underpricing is expected.

Offer Rate (RATE)

The percentage of equity offered to the public may signal the quality of the IPOs to the investor. According to Leland and Pyle (1977), the private information of the pre-offering corporate value was signaled to the potential investors through the percentage of equity retained. They hypothesized that the value of the firm is positively related to the percentage of equity retained in the firm by

the owners. Keasey and Short (1992) argue that a relatively high percentage of equity retention may reduce investors' uncertainty because the firms' owners have signaled their faith in business. On the other hand, the greater percentage of equity retained by owners may also be perceived by the market participants as less marketability of shares, which may increase the uncertainty. In order to test the effect of the percentage of equity offered to the public, the offer rate variable is employed. There is no pre-expectation regarding the sign of this variable.

Standard Deviation (STDDEV)

Rock (1986) takes underpricing as an information asymmetry between informed and uninformed investors. As a result of his model, the magnitude of underpricing depends on the uncertainty of the future market price. The more heterogeneous the expectations are, the larger the information asymmetries are and this uncertainty implies higher underpricing. The standard deviation of daily stock price returns are utilized during the first 30 trading days to measure uncertainty of the IPOs. Accordingly, average standard deviation is found to be 0.049. Higher standard deviation implies higher volatility, hence a direct relationship between this variable and underpricing is expected.

Method of Going Public (METHOD)

The IPOs can be classified as either offering new issues (i.e. primary) or sales of previously-issued outstanding shares (i.e. secondary). In the latter case, previously issued shares are offered to the public. The proceeds will go to the existing shareholders and these funds may not be used for the firms' growth strategies. This may suggest a higher level of underpricing. In the former case, the public offering is done through issuing new shares. Since the purchasing rights of existing shareholders are restricted, the proceeds will go to the firms and used for the growth strategies of the firms. The offering of new issues seems to be a better alternative for investors because the funds provided by the investors will be used for their firms. This may reduce the uncertainty. The institutional structure may provide an opportunity for testing the

impact of the issuers' motives going public. A dummy variable is employed, which takes the value of one, if offering is a new issue and, zero, otherwise.

Self-Offered IPOs (SELF-IPO)

Baron's (1982) model proposes that investment bankers have more information about demand for securities than the issuers. In his model, an investment banker may profit from the information advantage by setting its issue price too low. Muscarella and Vetsuypen (1989) test this model for U.S. firms, in which the issuer acted as an underwriter for its own IPOs. In this case, no information asymmetry should be expected and underpricing should disappear. They find no significant differences in their two samples and provide evidence on the information advantage of investment bankers. To test this explanation for Turkish IPOs, a dummy variable is employed. This variables takes the value of one, if investment bankers underwrite their own IPOs or one of family-firms' IPOs and, zero, otherwise. [5]

Table 2: Summary Statistics for Financial IPOs
Held on the ISE During 1990-1995

Panel A: Distributional Statistics for Raw and the Market Index-Adjusted Measures of Initial Underpricing

Statistics	Raw Returns	Market-Adjusted
Mean	0.146	0.153
Std.Deviation	0.408	0.407
Maximum	2.333	2.308
Minimum	-0.300	-0.297
t-valuec	2.26**	2.37**

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[5] Turkish private sector enterprises mainly consist of family-owned groups of companies which commonly include a financial institution, and hence they may use their family financial institution as investment banker. When a family-owned financial institution is used as investment banker in the process of going public, these IPOs are also considered under the self-offering group.

Panel B: Descriptive Statistics for Independent Variables

Variables	N	Mean	Std.Dev.	Min.	Max
ASSETd	39	5.838	1.859	1.824	8.847
AGE	39	15.897	19.955	0.000	68.000
PROCEEDSd	39	8.921	1.543	5.568	12.731
MARKET	39	0.081	0.137	-0.141	0.461
RATE	39	0.326	0.317	0.041	0.960
STDDEV	39	0.049	0.028	0.014	0.126
METHOD	39	0.358	0.480	0.000	1.000
SELF-IPO	39	0.498	0.240	0.000	1.000

a: Raw returns are based on the closing price on the first day of trading.
b: Market-adjusted returns are calculated by subtracting the ISE Composite Index returns from raw returns.
c: Statistically significant at 5 % level.
d: The natural logarithm of Total Asset and Gross Proceeds are used for analytical purposes and these are logarithmic values.

3.2. Method

In order to analyze the factors influencing the performances of financial IPOs, a multiple variable regression analysis is employed. The model has the following specifications.

$$\text{Underpricing} = \beta_0 + \beta_1(\text{Asset}) + \beta_2(\text{Age}) + \beta_3(\text{Proceeds}) + \beta_4(\text{Market}) + \beta_5(\text{Rate}) + \beta_6(\text{StdDev}) + \beta_7(\text{Method}) + \beta_8(\text{Self-IPO})$$

where:

Underpricing = market- adjusted initial returns
Asset = the natural logarithm of the total assets of the firm prior to the offering
Age = the number of years in operation (operating history) before the offering
Proceeds = the natural logarithm of the total proceeds in dollar terms
Market = market index returns over the one month prior to the first trading day
Rate = the percentage of equity offered to the public

StdDev. = the standard deviation of the market-adjusted returns
            during the first 30 trading days
Method = a dummy variable taking on the value of one if the firm
            issues primary shares and, zero, otherwise
Self-IPO = a dummy variable taking on the value of one if an
            investment bankers underwrites own IPOs or one, if
            family-firms' IPO and, zero, otherwise

IV. Empirical Results and Explanations for Underpricing

The variables described above are used as proxies for ex-ante uncertainty about the market performances of IPOs. Rock (1986) and Beatty and Ritter (1986) propose a positive relationship between underpricing and uncertainty of IPOs' performances. Generally, the underpricing phenomenon is analyzed in two different ways. The first one takes underpricing as a result of imperfect market conditions, and when these imperfections are removed, the underpricing should disappear. The second view considers underpricing as equilibrium market conditions and brings forth some theoretical explanations for its existence.

Univariate regression were initially performed for each variable defined above with underpricing as the dependent variable and statistically significant relationships were found for MARKET, STDDEV, and SELF-IPO variables. Then multivariate regressions were performed and the results are reported in Table 3. The adjusted R^2 values are ranging from 0.36 to 0.45 and all of the F-values are statistically significant at the 1% level. According to these regression results, the performances of Turkish financial IPOs are affected by the following factors.

4.1. Institutional Lag

Underpricing of IPOs may be a result of rises in the stock market between the date of fixing the offer price and the initial trading day. To investigate the validity of this proposition, the ISE Composite Index returns in 30 trading days prior to the first trading day are employed as proxy for market movements. In Table 3, the first regression results show that the coefficient of MARKET variable is 0.928 and is statistically significant at the 5% level. This variable

continues to hold in other regressions at the 1% significance level. These results show a positive relationship between market movements and underpricing. Accordingly, the rising of the stock market between the date of fixing the offer price and the first trading day is found to be an important factor affecting the performances of financial IPOs.

4.2. Asymmetric Information Hypothesis

One of the hypotheses to explain underpricing is the asymmetric information hypothesis. Within the asymmetric information hypothesis framework, Baron (1982) and Rock (1986) propose the existence of the asymmetric information as an explanation for underpricing. Baron's (1982) model proposes that investment bankers have more information about demand for securities than the issuer. In his model, an investment banker may profit from an information advantage by setting the issue price too low. To test this explanation for Turkish IPOs, a dummy variable (SELF-IPO) is employed. This variable takes the value of one, if investment banker is underwriting their own IPOs or, one if it is a family-run firm's IPO and, zero, otherwise. The coefficient of SELF-IPO variable is 0.226 in the first regression and statistically significant at the 5% level. This variable continues to be significant in the other regressions.

The positive relationship between SELF-IPO variable and underpricing indicates that self-issued IPOs are underpriced more than others. This result is not in line with the Baron (1982) hypothesis. One reason might be that investment bankers may want to leave a good taste in investors' mouths so that they can sell subsequent offerings at a better price. Nevertheless, this result is in line with studies contradicting Baron's (1982) asymmetric information hypothesis (i.e. Muscarella and Vetsuypens (1989)).

The other asymmetric information hypothesis is proposed by Rock (1986). In his model, Rock (1986) takes underpricing as information asymmetry between informed and uninformed investors. As a result of his model, the magnitude of underpricing depends on the uncertainty of future market price trends. The more heterogeneous the expectations are, the larger the information asymmetries become as this uncertainty implies higher

Table 3 : Results of Multiple Regression for IPOs Held During 1990-1995

Variables	1	2	3	4	5	6
Constant	-0.418	-0.376	-0.281	-0.468	-0.264	-0.371
	(-1.29)a	(-2.31)**	(-0.83)	(-1.40)	(-3.36)	
ASSET	-0.002	-	-0.010	0.012	-	-
	(-0.05)	-	(-0.24)	(0.31)	-	-
AGE		-0.001	-0.007	-0.004	0.001	- -
	(-0.35)	(-0.20)	(-1.14)	(0.30)	-	-
PROCEEDS	-126.2	-	-181.52	-112.81	-	-
	(-1.50)	-	(-2.15)**	(-1.34)	-	-
MARKET	0.928	1.125	-	1.031	1.118	1.148
	(2.15)**	(2.73)***	-	(2.45)**	(2.93)***	(3.15)***
RATE	0.185	0.047	0.231	0.186	-	-
	(0.71)	(0.24)	(0.84)	(0.75)	-	-
TDDEV	9.030	6.796	10.420	8.858	6.638	7.010
	(3.75)***	(3.60)***	(4.24)***	(3.59)***	(3.61)***	(3.97)***
METHOD	-0.040	0.015	-0.137	-	-	-
	(-0.28)	(0.11)	(-0.97)	-	-	-
SELF-I	0.226	0.228	0.232	-	-	0.209
	(2.01)**	(2.07)**	(1.94)*	-	-	(2.12)**
POR2	0.5327	0.4973	0.4604	0.4637	0.4279	0.4930
Adjusted R2	0.4081	0.4030	0.3386	0.3632	0.3961	0.4495
F-Value	4.82***	5.83***	4.34***	5.18***	12.01***	10.99***

*, ** ,and *** indicate the level of significance at 10%, 5% and 1%, respectively.
a: The numbers in parantheses indicate t-values.

underpricing. The standard deviations of daily stock price returns during the first 30 trading days are used to measure the uncertainty of IPOs. The regression results support Rock's (1986) hypothesis. The first regression on Table 3 shows the coefficient of 9.03, which is statistically significant at the 1% level. This variable continues to be significant in other variations of regressions. Hence, Rock's (1986) asymmetric information hypothesis proves valid for the

Turkish financial IPOs made on the ISE.

4.3. Other Findings

Three size variables are used as potential proxies for ex-ante uncertainty about market performances of IPOs, namely ASSET, AGE and PROCEEDS. While the ASSET variable intends to test the relationship between the asset size and underpricing, the AGE variable tests the link between the number of operating years (or the age of the firm) and underpricing. PROCEEDS variable tests the relationship between the size of funds raised and underpricing. Since smaller firms are more speculative than larger firms, the underpricing is expected to be pronounced more explicity in smaller firms. Hence an inverse relationship between these variables and underpricing is expected. Table 3 reports that these three variables have the expected signs but only PROCEEDS variable is statistically significant in the third regression. The coefficient of ASSET variable is -0.002, indicating that underpricing is more severe in smaller firms. Similarly, the AGE variable has a coefficient of -0.001 and shows that underpricing is higher for younger firms. PROCEEDS variable has the coefficient of -126.2, which is in line with the expectation that smaller proceeds are more speculative and consequently underpricing is more evident in smaller IPOs.

The METHOD variable investigates the link between the method of going public and underpricing. Although the METHOD variable is not statistically significant, it has the expected negative coefficient of -0.040. The results show that issuing new shares is perceived as better news than secondary offerings by investors. Hence, the uncertainty and underpricing are lower in newly-issued offers. These results are in line with the expectations. The RATE variable has the coefficient of 0.185 in first regression and is statistically insignificant. The sign of the coefficient remains same in all regressions. The positive relationship between the rate and underpricing shows that higher percent of equity offering also increases underpricing.

V. Conclusion

The performances of IPOs have been widely investigated in several

markets. The evidences on the performances of IPOs in the literature suggest that investors purchasing IPOs at the offer price earn abnormal returns in the short-term after-market period. However, there exists a disagreement in the literature in regard to the long-run performances of the IPOs. Studies on Turkish IPOs (Kıymaz (1996a) and Kıymaz (1996b)) show that there exists underpricing on the initial trading day. For example, market-adjusted abnormal returns are found to be 15.3 % for financials and 12.2% for industrial IPOs. The purpose of the paper is to investigate the factors influencing the performances of Turkish financial IPOs and to test some of the explanations of underpricing suggested in the literature.

Generally, the literature on underpricing relates to the underpricing phenomena to ex-ante uncertainty (Beatty and Ritter (1986), Rock (1986)). In line with these studies, a positive relationship between the level of underpricing and the level of ex-ante uncertainty of a new issue is expected. Since it is not possible to measure ex-ante uncertainty directly, a number of variables are used as proxies. These variables are the total assets of firms prior to going public, operating history of the firms, gross proceeds in dollar terms, market returns over 30 days prior to going public, percentage of the equity offered to the public, standard deviation of stock in the first 30 days of trading, method of going public and self-offerings. The market-adjusted abnormal returns in the first trading day are employed as the dependent variable. The empirical results show that MARKET, STDDEV, SELF-IPO and PROCEEDS variables are statistically significant determinants of underpricing of the financial IPOs. The significance of the MARKET variable indicates that the rises in stock market between the date of price fixing and the first trading day is an important determinant of underpricing. Furthermore, the existence of asymmetric information in Rock (1986), as a determinant of underpricing, is detected. This information asymmetry is measured by the standard deviation of IPOs in the first 30 trading days. SELF-IPO variable is statistically poorly significant and indicates that self-offered IPOs are underpriced more than others. This result contradicts with Baron's (1982) hypothesis but is in line with Muscarella and Vetsuypens

(1989).

In summary, similar to the results of studies conducted an international IPOs, there exists an initial underpricing in Turkish financial IPOs. The market-adjusted first day returns are 15.3% for financial firms listed and traded on the Istanbul Stock Exchange. The investigation of factors influencing the initial performance reveals that the rising market between the fixing of the offering price and the first trading day, the standard deviation of market-adjusted returns of IPOs during the first 30 trading days are found to be highly significant determinants of underpricing. Furthermore, the size of the income, generated from the public offering and the self-issued offerings variables are found to be weak determinants of initial underpricing.

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Figure 1 : Short-Run Trading Performances
of Turkish Financial IPOs
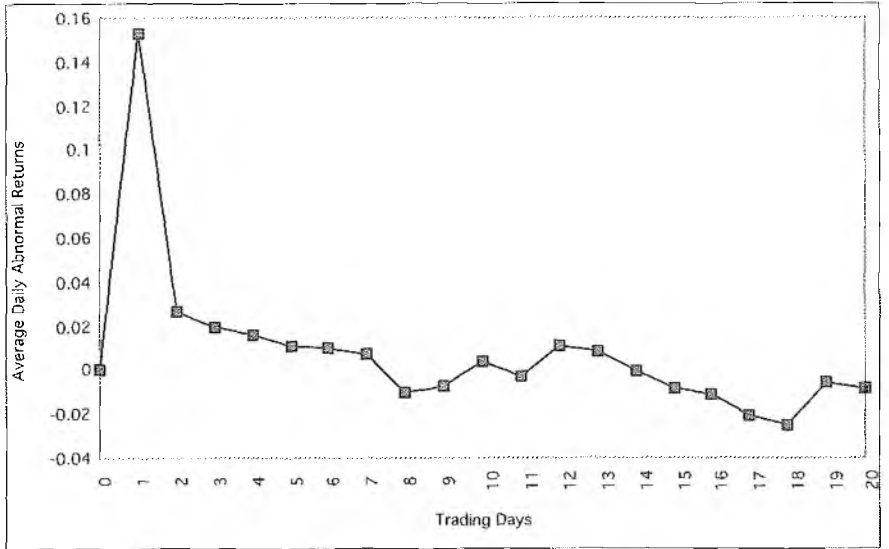
ISE Market Indicators

STOCK MARKET

	"Number of Companies"	Traded Value				Market Value		"Dividend Yield"	"P/E Ratios"
		Total		Daily Average					
		(TL Billion)	(US$ Million)	(TL Billion)	(US$ Million)	(US$ Million)	Milyon ABD $		
1986	80	9	13	0.03	0.05	709	938	9.15	5.07
1987	82	105	118	0.42	0.47	3,182	3,125	2.82	15.86
1988	79	149	115	0.59	0.45	2,048	1,128	10.48	4.97
1989	76	1,736	773	6.81	3.03	15,553	6,756	3.44	15.74
1990	110	15,313	5,854	61.99	23.70	55,238	18,737	2.62	23.97
1991	134	35,487	8,502	143.67	34.42	78,907	15,564	3.95	15.88
1992	145	56,339	8,567	224.46	34.13	84,809	9,922	6.43	11.39
1993	160	255,222	21,770	1.037.49	88.50	546,316	37,824	1.65	25.75
1994	176	650,864	23,203	2.572.58	91.71	836,118	21,785	2.78	24.83
1995	205	2,374,055	52,357	9.458.39	208.59	1,264,998	20,782	3.56	9.23
1996	228	3,031,185	37,737	12.272.00	152.78	3,275,038	30,797	2.87	12.15
1996 Q1*	206	774,606	12,075	13.128.92	204.66	2,213,410	31,480	4.02	11.84
1996 Q2	214	631,867	8,357	10.358.47	137.00	2,380,029	29,390	3.73	12.53
1996 Q3	222	473,672	5,548	7.287.27	85.35	2,542.240	28,043	3.51	9.74
1996 Q4	228	1,151,040	11,758	18.565.16	189.64	3,275,038	30,797	2.87	12.15

*Q= Quarterly

Closing Values of the ISE Composite Index

	TL Based (Jan. 1986 = 1)			US$ Based (Jan. 1986=100)		
	Composite Index	Financials Index	Industrials Index	Composite Index	Financials Index	Industrials Index
1986	1.71			131.53		
1987	6.73			384.57		
1988	3.74			119.82		
1989	22.18			560.57		
1990	32.56	32.56	32.56	642.63	642.63	642.63
1991	43.69	33.55	49.63	501.50	385.14	569.63
1992	40.04	24.34	49.15	272.61	165.68	334.59
1993	206.83	191.90	222.88	833.28	773.13	897.96
1994	272.57	229.64	304.74	413.27	348.18	462.03
1995	400.25	300.04	462.47	382.62	286.83	442.11
1996	975.89	914.47	1,045.91	534.01	500.40	572.33
1996 Q1*	670.45	597.93	736.15	554.88	494.86	609.25
1996 Q2	704.89	599.40	785.34	506.52	430.72	564.33
1996 Q3	724.53	645.93	792.82	465.08	414.63	508.91
1996 Q4	975.89	914.47	1,045.91	534.01	500.40	572.33

*Q= Quarterly

BONDS AND BILLS MARKET

Outright Purchases and Sales Market

	Public Securities Traded Value				**Private Securities Traded Value**			
	Total		Daily Average			Total		Daily Average
	TL Billion	_US$ Million_	_TL Billion_	_US$ Million_	_TL Billion_	_US$ Million_	_TL Billion_	_US$ Million_
1991	1,476	312	10.85	2.30	--		--	--
1992	17,955	2,403	71.54	9.57	22	3.18	0.09	0.01
1993	122,738	10,718	498.94	43.57	120	9.98	0.49	0.04
1994	269,940	8,828	1,066.95	34.89	52	3.55	0.21	0.01
1995	739,942	16,509	2,936.28	65.51	--	--	--	--
1996	2,710,973	32,737	10,757.82	129.91	--	--	--	--
1996 Q1*	434,010	6,777	7,114.92	111.10	--	--	--	--
1996 Q2	540,243	7,121	8,856.45	116.74	--	--	--	--
1996 Q3	696,465	8,179	10,714.85	125.82	--	--	--	--
1996 Q4	1,040,255	10,660	16,003.92	184.00	--	--	--	--

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

	30 Days	**91 Days**	**182 Days**	**General**
	TL-Based			
1996	103.41	110.73	121.71	110.52
1996 Q1*	101.65	105.59	112.09	105.26
1996 Q2	103.04	108.43	114.37	108.09
1996 Q3	102.85	108.19	114.67	108.58
1996 Q4	103.41	110.73	121.71	110.52
	US$ Based			
1996	57.09	61.13	67.19	61.01
1996 Q1	85.54	88.86	94.32	88.58
1996 Q2	75.29	79.22	83.56	78.98
1996 Q3	67.13	70.61	74.84	70.87
1996 Q4	57.09	61.13	67.19	61.01

*Q= Quarterly

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

	TL-Based		
	30 Days	**91 Days**	**182 Days**
1996	222.52	240.92	262.20
1996 Q1*	126.34	131.13	138.75
1996 Q2	153.86	162.85	172.31
1996 Q3	184.91	198.31	215.83
1996 Q4	222.52	240.92	262.20
	US$ -Based		
1996	122.84	132.99	144.74
1996 Q1*	106.32	110.35	116.76
1996 Q2	112.42	118.99	125.90
1996 Q3	120.69	129.43	140.87
1996 Q4	122.84	132.99	144.74

Repo - Reverse Repo Market

Repo-Reverse Repo Traded Value				
	Total		Daily Average	
	TL *Billion*	*US$* *Million*	*TL* *Billion*	*US$* *Million*
1993	59,009	4,794	275.74	22.40
1994	756,683	23,704	2,990.84	93.69
1995	5,781,776	123,254	22,943.56	489.10
1996	18,340,459	221,405	72,779.60	878.59
1996 Q1*	2,899,673	45,246	47,535.62	741.74
1996 Q2	4,170,337	54,966	68,366.18	901.08
1996 Q3	4,414,092	52,055	67,909.11	800.85
1996 Q4	18,340,459	221,405	72,779.60	878.59

*Q= Quarterly

Global Capital Markets

The strength of the U.S. economy, with an average 2.5% growth and a favorable inflation outlook in 1996, coupled also with recovery in many European economies, have increased optimism for 1997 in most of the capital markets. Spurred by realized or temporary economic indicators issued for 1996, equity prices and trading volumes in many stock exchanges across America, Europe and the Far East have staged on upward trend in early 1997.

Turkey experienced, on the other hand, an increasing trade deficit and a steady and chronic high inflation at about 80% in 1996. However, following the economic crisis in 1994, the Turkish economy registered an annual growth rate of 8% in 1995 and about 7-8% in 1996. The primary concern related to the Turkish economic development in the first months of 1997 has been the record levels attained on the Istanbul Stock Exchange (ISE). While the equity market saw a 52% rise in January 1997, the market capitalization reached $ 45.1 billion.

The capital markets in developing economies have also been continuing to expand and increase their capitalization. The ratio of market capitalization to GDP is the highest in Malaysia, South Africa, Taiwan and the Philippines. Only Latin American markets suffered a plunge in 1996. Besides, the so-called countries in transition like Poland, Hungary and Russia demonstrated significant developments in terms of capitalization and the total capital raised. The ratio of Polish market's capitalization to GDP, for instance, rose to 6% at the end of 1996, from 3% in 1994.

With respect to rising share prices and trading volumes in January 1997, the ISE's market capitalization increased dramatically reaching 18% of GNP, in contrast to 14% recorded in 1994.

The IFCG Composite Total Return Index, representing the emerging capital markets, posted a return of %7.4 in 1996, while the Standard&Poor's and FT Euro Pac, structured for developed markets, advanced 3.6% and 20.3, respectively. After the negative effects of the Peso Crisis in 1994, most of the market indicators in

the emerging markets recovered by the end of 1995 and 1996. In 1997, expectations concerning the prospects in emerging markets, especially in regard to the share price patterns, point to a bullish cause.[1]

In January 1997, impressive performance was also achieved in some other major stock market; NASDAQ and the NYSE were ranked as the most liquid, while the NYSE and the Osaka emerged as the biggest ones. The U.S., Japan, UK, Germany and France were the most highly capitalized countries in order of succession. In addition, due to its position as the front-runner in the emerging markets with an advanced technological infrastructure, comprehensive transparency and complete regulatory environment, the ISE is fast approaching a status as a developed market.

As developing countries give priority to fixed-income securities markets, the annual rates of return on emerging markets are comparatively higher than those in developed centers. For instance, a 12 - month bond index return in Russia yields 115%, while it is 30.64% in Italy regarded generally as among the highest in the developed markets category. Due to the expectation that Italy will join the European Monetary Union (EMU) in the first round, the yield on the Italian Government bonds declined from 7.7% to 7.2% in January. [2]

Following a decrease in capital flows to emerging markets since 1994, international financial institutions and investors have attempted again to increase their exposure in these markets. Unless another crisis erupts in any of the emerging markets, their liquidity and capitalization are poised to live through another episode of boom like in 1991 and 1994. [3]

As for the globalization of capital markets, foreign share in the total trading on the ISE is increasing, generally as a result of purchases. In January 1997, foreigners accounted for 8.5%, while the share of cross-border selling transactions amounted to about 7.5%. Provided that the sufficient supply is assured by the market in parallel to the growing non-resident purchases, the market will, most probably, sustain the current trend. So, the correlation of the price/return series may increase during the integration period.

[1] FIBV, January 1997, Emerging Markets Investor, Vol.4, No.2. February 1997.

[2] World Equity, No. 39, February 1997, p.18.

[3] Emerging Markets Investor, Vol. 4, No. 2. February 1997: IMF, International Capital Markets, World Economic and Financial Surveys, September 1996. Washington, DC. pp. 85-119.

Emerging Stock Markets' Importance in the National Economy (1996)

Country	Market Capitalization/GNP
Malaysia	327%
S.Africa	198%
Taiwan	98%
Phillippines	95%
Chile	91%
Thailand	60%
Indonesia	38%
Czech Rep	35%
Mexico	34%
India	34%
Korea	31%
Brazil	27%
Peru	23%
Colombia	20%
Turkey	18%
Argentina	17%
Hungary	11%
China	9%
Russia	8%
Poland	6%

Market Capitalization/GNP
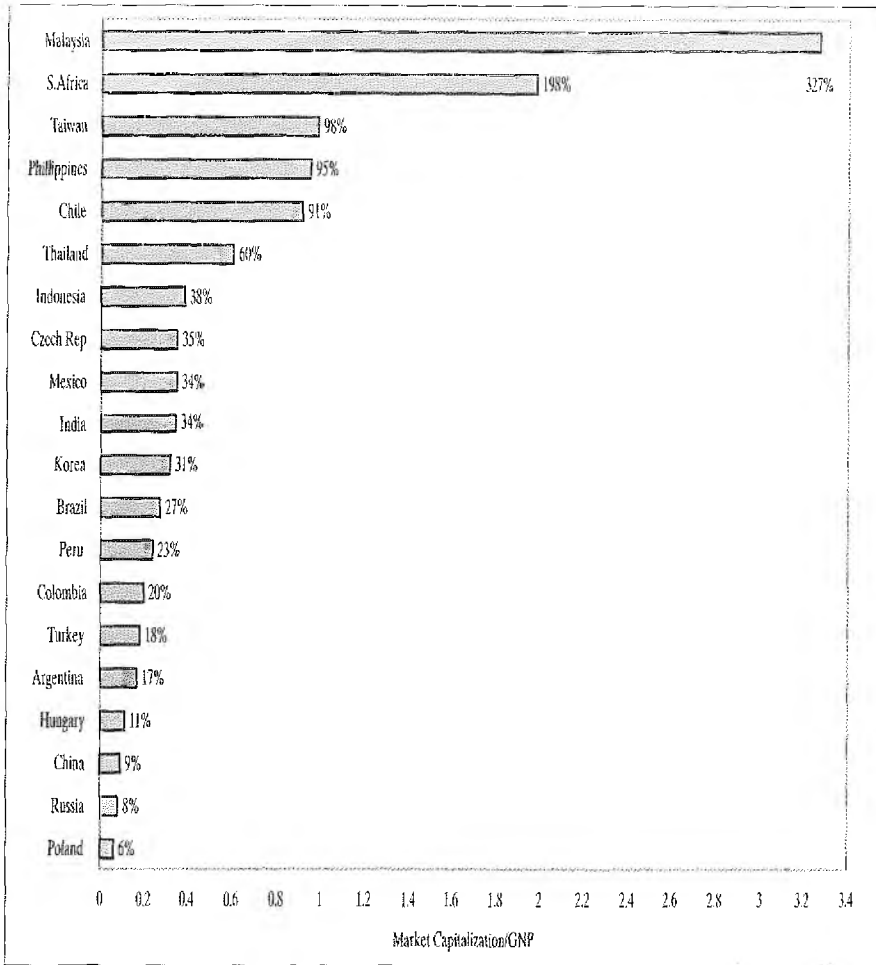
Source: Emerging Markets Investor, Vol 4, No.2, February 1997, pp.41-48.
Note: The capitalization of stock market as of Nov. 1996 is the total market value of the listed and trading companies in the country's stock exchange or exchanges. GNP values are estimated by the Emerging Markets Investor.

Market Capitalization (US$ Million, 1986-1995)

	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	NA	NA	2.139.779*	30.797

Source: IFC Factbook 1996,16-17; ISE Monthly Bulletin, January 1997.
* : Temporary.

Comparison of Markets' Indices (1984-96)
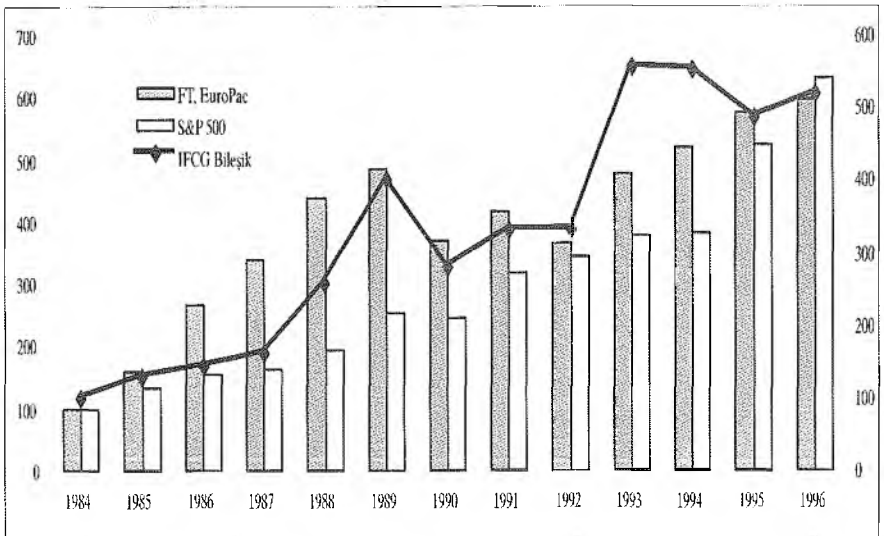
Source: IFC Factbook 1996, 43; IFC Monthly Review, December 1996; IFC, January
1977

Worldwide Share of Emerging Capital Markets
(1985-1995)
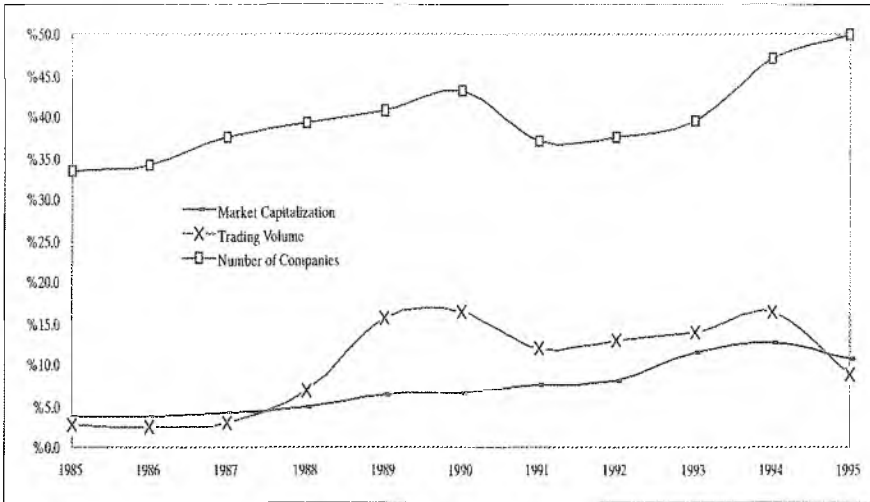
Source: IFC Factbook 1996, 16-23.

Note: Number of trading companies in emerging markets increaseddramatically until 1995 and the worldwide share reached 50 %. On the other hand, their share in global capitalization is relatively very low since the average size of the companies is significantly smaller.

The ISE's Share in World Markets (1986-1995)
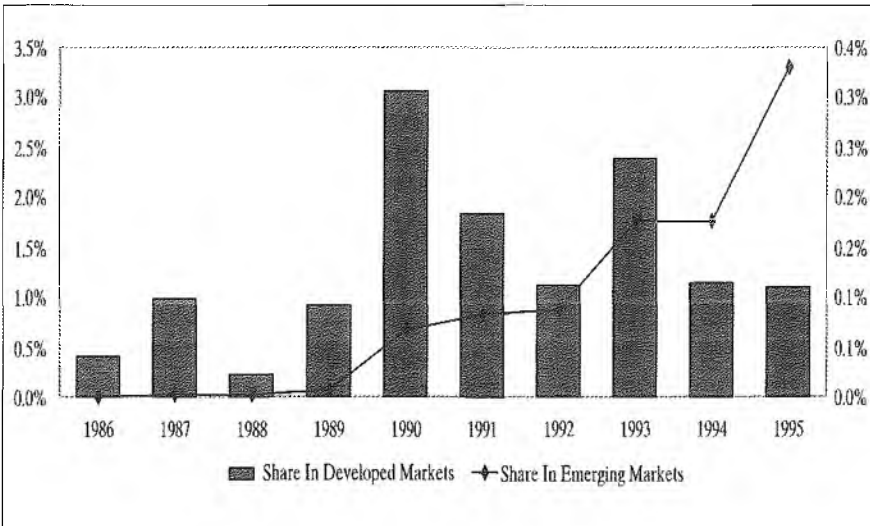
Source: IFC, 1996.

Main Indicators of Capital Markets
(January 1997)

	Markets	Turnover Velocity (Monthly)	Markets	Value of Share Trading (US$Million,) (Monthly)	Markets	Market Capitalization of Shares of Domestic Companies
1	Nasdaq	290%	NYSE	479,582	NYSE	7,226,891.1
2	Taiwan	280%	Nasdaq	378,819	Tokyo	2,674,662.5
3	Paris	192%	Paris	99,645	Osaka	2,205,527.8
4	Madrid	181%	Germany	85,979	London	1,683,765.1
5	Istanbul	166%	Taiwan	69,301	Nasdaq	1,510,369
6	Germany	148%	Tokyo	68,961	Germany	665,967.7
7	Barcelona	133%	Switz.	45,331	Paris	610,147.8
8	Switz.	124%	Madrid	36,093	Toronto	514,212.7
9	Korea	116%	Honk K.	27,763	Hong K.	449,895.2
10	Bilbao	102%	Toronto	26,867	Switz.	412,766.4
11	Warsaw	91%	Amster.	23,557	Amst.	377,788.8
12	Oslo	90%	Italy	21,200	Kuala Lr.	317,267.3
13	Italy	90%	Barcelona	19,958	Austrl.	300,300.3
14	Vancouver	88%	Bilbao	16,733	Taiwan	291,551.7
15	Copen.	85%	Kuala L.	16,060	Italy	282,085.4
16	Buenos A.	78%	Stockh.	15,221	Johann.	248,210
17	Hong K.	74%	Korea	13,852	Stockh.	244,549.9
18	NYSE	73%	Osaka	12,720	Madrid	239,467.3
19	Stockholm	69%	Australian	12,314	Rio de J.	237,097.7
20	Amsterdam	67%	Singapore	7,017	Bilbao	196,174.1
21	Toronto	63%	Istanbul	6,235	Barcelona	180,653.1
22	Helsinki	61%	Copen.	5,303	Singapore	154,391.1
23	Kuala L.	61%	Oslo	4,867	Korea	142,773.4
24	Lisbon	59%	Mexico	4,518	Brussels	121,441.1
25	Singapore	55%	Jakarta	4,330	Mexico	113,753.2
26	Jakarta	52%	Thailand	3,526	Jakarta	99,372.7
27	Australia	49%	Helsinki	3,386	Thailand	90,673.4
28	Thailand	47%	Buen. A.	3,148	Phillippine	89,031.4
29	Mexico	46%	Phillipp.	2,909	Copen.	73,576.7
30	Athens	45%	Brussels	2,760	Santiago	72,359.5
31	Phillippines	39%	Johann.	2,578	Helsinki	66,419.0
32	Tel Aviv	36%	Lisbon	1,277	Oslo	62,774.3
33	Lima	33%	Tel-Aviv	1,243	Buenos A.	48,653.2
34	Vienna	31%	Rio de Jan.	1,056	Istanbul	45,158.8
35	Tokyo	31%	Athens	1,026	Tel-Aviv	40,964.2

Main Indicators of Capital Markets
(January 1997)(Continued)

	Markets	Turnover Velocity (Monthly)	Markets	Value of Share Trading (US$Million,) (Monthly)	Markets	Market Capitalization of Shares of Domestic Companies
36	Ireland	24%	Vienna	867	N. Zealand	37,706.0
37	N. Zealand	24%	Vancouver	789	Ireland	37,634.4
38	Brussels	23%	N. Zealand	772	Luxemb.	32,979.8
39	Johannesb.	12%	Irish	751	Vienna	32,608.7
40	Santiago	12%	Santiago	704	Athens	27,439.2
41	Tehran	8%	Warsaw	690	Lisbon	26,032.6
42	Osaka	7%	Lima	380	Tehran	16,571.8
43	Rio de Jan.	5%	Tehran	159	Lima	12,901.6
44	Luxemb.	4%	Luxemb.	101	Vancouver	10,706.2
45	London	NA	London	NA	Warsaw	9,088.6

Source: FIBV, Focus, January 1997.

Trading Volume (US$ billion, 1986-1995)

	Global	Developed	Emergin g	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	NA	NA	1,430,148*37	737*	NA	%2.50*

Source: IFC Factbook 1996, pp.20-21.
*: Temporary

Number of Trading Companies (1986-1996)

	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	NA	NA	16,803*	228	NA	%1.36*

Source: IFC Factbook 1996, pp.22, 23.   * : Temporary

Comparison of Markets' Performances (December 1996)
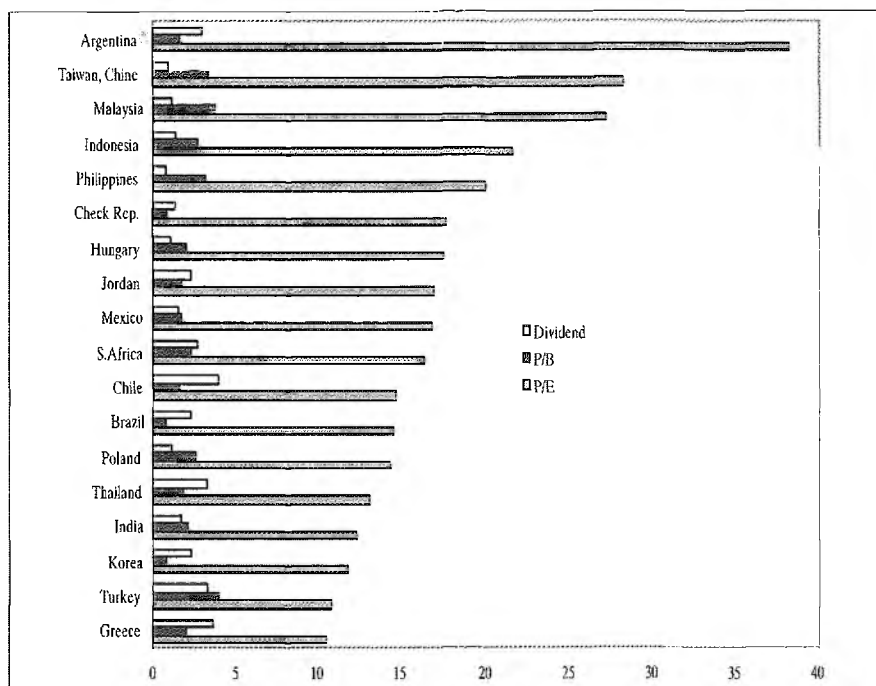
Source: IFC, 1996-1997.
Notes: P/B= Market Value (Price)/Book Value; P/E = Price/Earnings.

Price-Earnings Ratios in Emerging Markets (1992-1996)

Markets	1992	1993	1994	1995	1996
Brazil	-24.4	12.6	13.1	36.3	14.50
Argentina	38.0	41.9	17.7	15.0	38.21
Taiwan, China	16.6	34.7	36.8	21.4	28.16
Malaysia	21.8	43.5	29.0	25.1	27.11
Philippines	14.1	38.8	30.8	19.0	19.99
Indonesia	12.2	28.9	20.2	19.8	21.62
S. Africa	13.2	17.3	21.3	18.8	16.27
Thailand	13.9	27.5	21.2	21.7	13.06
Hungary	-	52.4	-55.3	12.0	17.48
Mexico	12.3	19.4	17.1	28.4	16.79
Check Rep.	-	18.8	16.3	11.2	17.62
Chile	13.0	20.0	21.4	17.1	27.76
Jordan	14.5	17.9	20.8	18.2	16.89
Korea	21.4	25.1	34.5	19.8	11.69
Poland	-	31.5	12.9	7.0	14.30
India	33.7	39.7	26.7	14.2	12.32
Turkey	6.9	36.3	31.0	8.4	10.74
Greece	6.9	10.2	10.4	10.5	10.45

Source: IFC Factbook 1996, pp.129-233; IFC, January 1997.

ISE's Price-Earnings Ratio (1986-1997)

**Source:** ISE Monthly Bulletin, December 1996, January 1997.

Market Value/Book Value Ratios (1992-1996)

|	1992	1993	1994	1995	1996
Turkey	1.3	7.2	6.3	2.7	3.98
Malaysia	2.5	5.4	3.8	3.3	3.78
Taiwan, China	2.1	3.9	4.4	2.7	3.31
Philippines	2.4	5.2	4.5	3.2	3.14
Indonesia	1.6	3.1	2.4	2.3	2.66
Poland	-	5.7	2.3	1.3	2.59
S. Africa	1.4	1.8	2.6	2.5	2.34
India	4.7	4.9	4.2	2.3	2.07
Greece	1.7	1.9	1.9	1.8	2.01
Hungary	-	1.6	1.7	1.2	1.97
Thailand	2.5	4.7	3.7	3.3	1.78
Jordan	1.6	2.0	1.7	1.9	1.71
Mexico	2.0	2.6	2.2	1.7	1.68
Argentina	1.2	1.9	1.4	1.3	1.62
Chile	1.7	2.1	2.5	2.1	1.59
Czech Rep.	-	1.3	1.0	0.9	0.89
Korea	1.1	1.4	1.6	1.3	0.76
Brazil	0.4	0.5	0.6	0.5	0.73

Source: IFC Factbook 1996, pp.129-233.

Countries Ranked by 12- Month Return in Bond Markets
(December 1996)
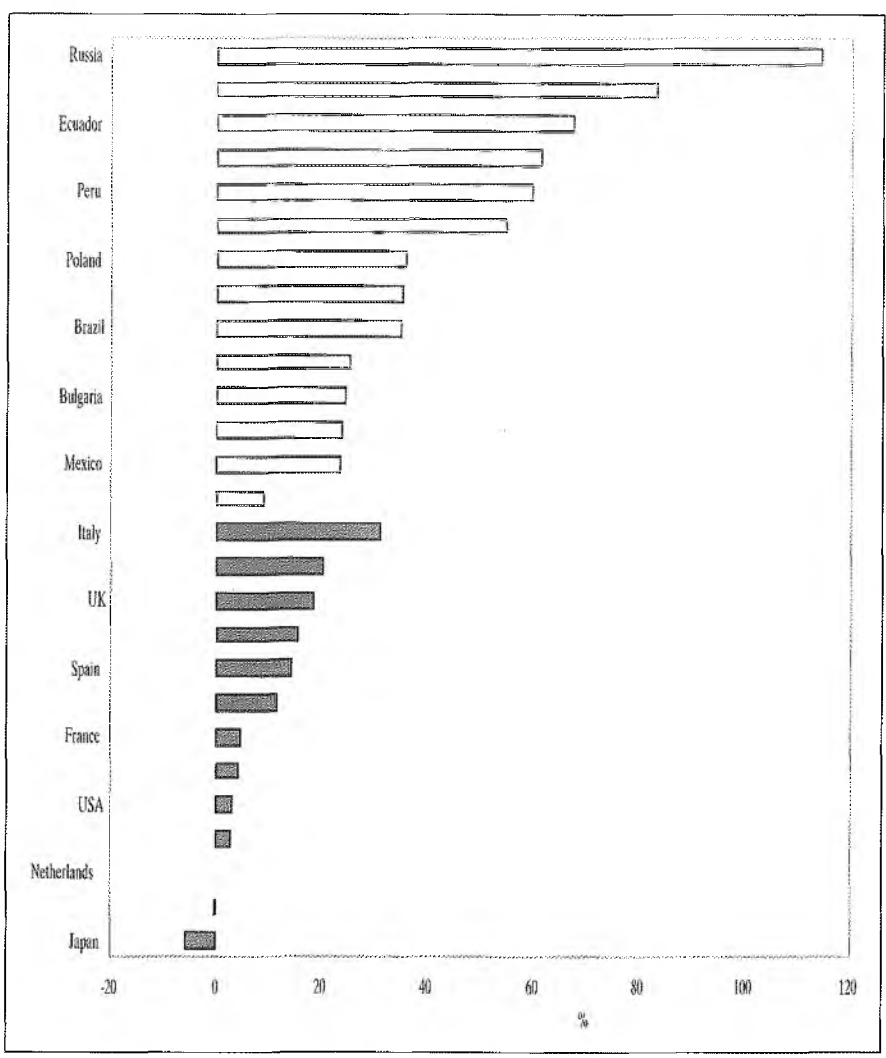
Notes: The data based on government bonds in developed markets is given by JP. Morgan Securities Inc. as of December 1996 for 12-month return indexes. Besides, the data based on government bonds in emerging markets presents 12 month change in bond markets indices (EMBI by JP Morgan Securities. See, World Equity, No.39, February 1997, pp.18-19.

Foreign Investments and Market Capitalization in Emerging Markets (1985-1995)
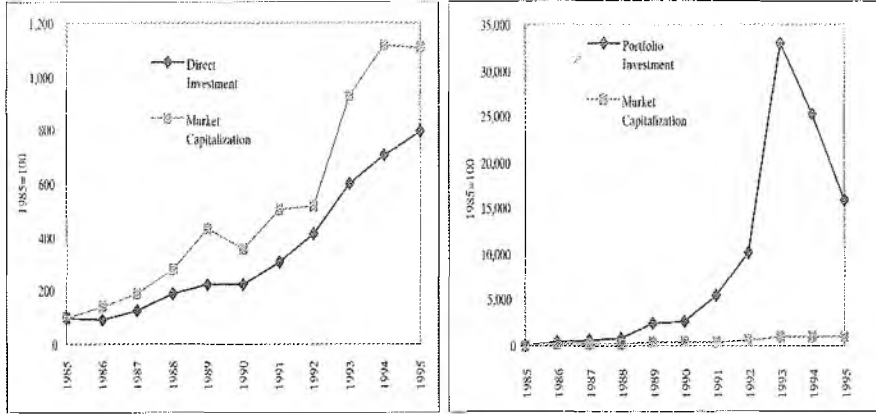
Source: IFC Factbook 1996, pp.6-23.

Notes: Private capital flows to developing countries rose by $60 billion in 1996, to $244 billion. The private capital goes to few countries. Turkey is in the 10th place of top recipients in 1996. See, The Economist, March 29 h. 1997, p.128.

## Foreign Investments as a Percentage of Market Capitalization in Turkey (1986-1996)
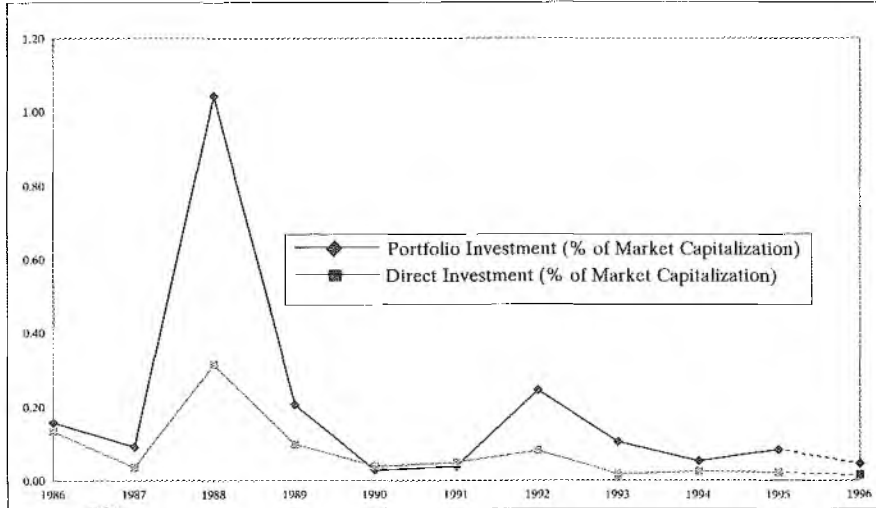
Source: SPO (DPT), Main Economic Indicators, July 1996, 47; January 1997; SPO, Economic and Social Indicators 1950-1995, p. 36; ISE's Monthly Bulletins.

Notes: The foreign investment values of 1996 denote cumulated net amount for the first nine months. The market value, however, is again as of December 1996.

Foreigners Share in the Trading Volume of the ISE
(Monthly, 1996-1997)
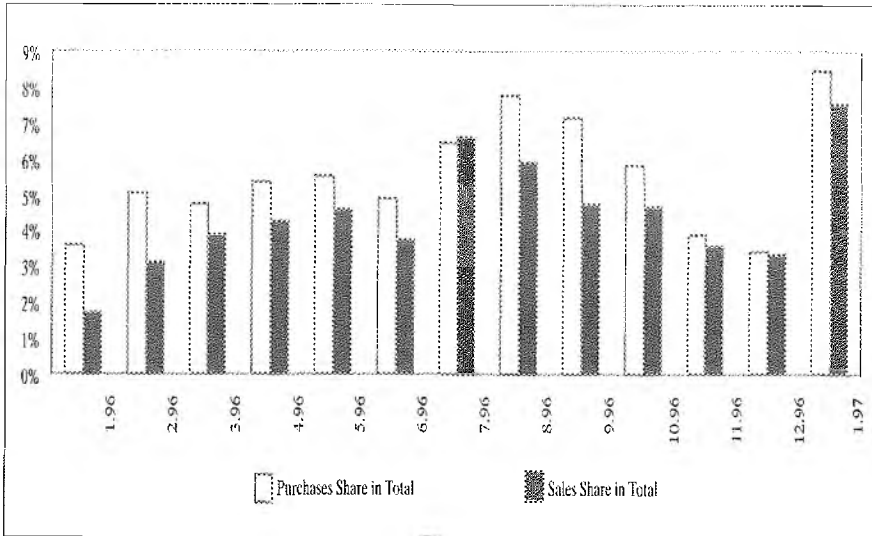
Source: ISE, Monthly Bulletin, January 1997.

Return Index Correlations of the ISA
(December 1990-December 1995)
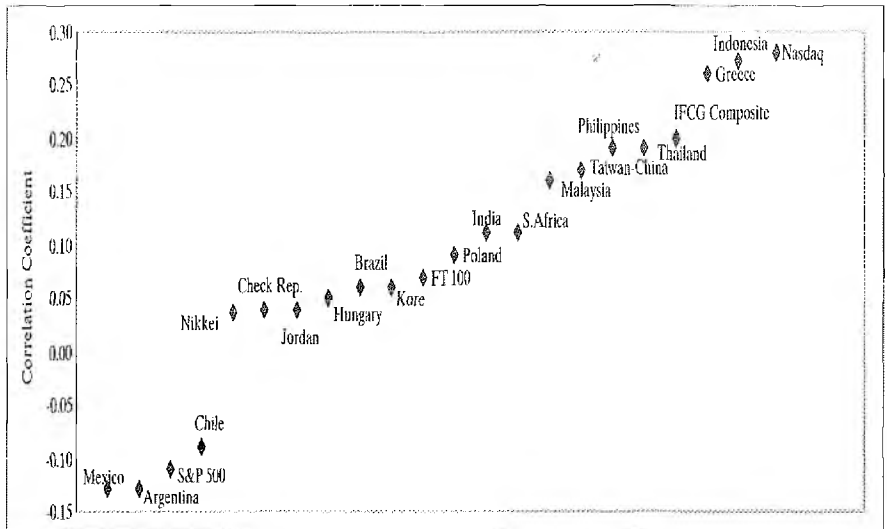
Note: The correlation coefficient is between -1 and 1. If it is zero, for the given period, it is implied that there is no linear relation between the two series of returns. For monthly return index correlations, see, IFC, Factbook 1996,p.62.

Book Reviews

Investment; Volume 1: Capital Theory and Investment Behavior; Volume 2: Tax Policy and the Cost of Capital, Dale W. Jorgenson, The MIT Press, Cambridge, 1996, pp. xxiv+512 (I), xxxi+468 (II).

This book contains Dale W. Jorgenson's theoretical and empirical work on investment behavior. The first volume, titled *"Capital Theory and Investment Behavior"* brings together many of his empirical studies, describing the theory, measurement of the cost of capital and the econometric modeling of investment behavior. The second volume, headlined, *"Tax Policy and the Cost of Capital"* covers the analysis of the cost of capital and the effects of taxation on capital formation. The unifying framework for the two volumes is provided by *"Capital Theory and the Cost of Capital."* Dale W. Jorgenson and several of his colleagues' studies set an example of tight integration of micro and macroeconomic issues. The influential papers introduce new econometric methods for modeling in the investment process, evaluated by integrating theory, measurement and macroeconometrics.

The first volume brings together the statistical methods, focusing on the cost of capital as a determinant of investment expenditures. Jorgenson's 1963 paper, printed as Chapter 1, presents all the important features of the econometric models of investment behavior summarized in the first volume. It introduces a theory of investment behavior on the basis of the neoclassical theory of optimal accumulation of capital.

The close relationship between investment behavior and its underlying determinants is of critical importance for economic stabilization policies. Jorgenson discussed new econometric methods for modeling gestation lags between the initiation and completion of investment projects in his paper, titled *"Capital Theory and Investment Behavior".*

Statistical methods for modeling gestation lags are discussed in his 1966 paper, *"Rational Distributed Lag Functions".* The key

innovation of this paper appears as a full focus on the flexibility in representing components of distributed lag functions. In 1970, this concept was assimilated into the statistical literature through the *"transfer function"* of Box and Jenkins.

The papers of Jorgenson and James A. Stephenson (1967, 1969) analyzed the lag distribution and the theory of investment behavior sub-industries in the investment process for 15 sub-industries of manufacturing in the United States. The overall conclusion of these studies is that a theory of investment behavior, based on the neoclassical theory of optimal accumulation of capital, provides better explanation of actual investment expenditures for the sample period.

Calvin D. Siebert and Jorgenson (1968) compared five alternative econometric theories of investment behavior for 15 major U.S. manufacturing corporations. The conclusion is that neoclassical models provide a better explanation of corporate investment than models focusing on capacity utilization or profit expectations.

Three alternative econometric models of investment were compared with Jorgenson and Stephenson investment models in the studies of Jorgenson with Jerald Hunter and M. Ishaq Nadiri (1970). Comparisons of the three alternative models constructed by Anderson (1964), R. Eisner (1965) and J. Meyer-R. Glauber (1964) showed that the Jorgenson-Stephenson model was superior to them. The forecasting schemes of the neoclassical model that Jorgenson and Stephenson had constructed provided a better fit to data on investment expenditures.

The second volume contains the cost of capital approach to tax policy analysis. The studies in this volume are devoted to the analysis of the cost of capital, investment behavior and the effects of taxation on capital formation. The paper of Jorgenson with Robert E. Hall (1967) investigated the relationship between investment expenditures and tax policy using the neoclassical theory of optimal capital accumulation. This was the first application of the cost of capital approach to the analysis of tax policy. On the basis of this work, Hall and Jorgenson (1971) analyzed all of the tax policies considered in their 1967 paper.

Jorgenson and Alan Auerbach (1980) explained the concept of

marginal effective tax rate which introduced a new framework for capital income taxation analysis. It is concluded in the study that tax policy analysis on the basis of the capital cost approach provides an impetus for tax reform.

The effects of alternative tax policies in terms of economic welfare have been evaluated by the studies of Jorgenson with Kun-Young Yun. The economic impact of tax reform is analyzed by a dynamic general equlibrium model including the capital cost to the investment function.

Dale W. Jorgenson has made monumental contributions to the foundation and development of modern economic dynamics. The collection of Jorgenson's studies set an example of tight integration of theory and measurement of capital cost, as well as capital accumulation and investment behavior. Papers collected in these two volumes will present a new perspective to economy, especially on investment and public finance. We believe that this book will be abundantly instructive for researchers.

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The Emerging European Union, David M. Wood & Birol Yeşilada, Longman Publ., New York, 1996, pp: xvii + 254.

Following its integration and gradual development since the Schuman Plan, introduced in 1950, the European Union (EU) is now transformed into an Economic and Monetary Union seeking also a Political Union.

"The Emerging European Union" presents a comprehensive guide to the transformation of the Community into a Union and intends to evaluate the recent developments in the integration process of the European Union.

In the introduction, the governing institutions of the Communities are identified and explained within the framework of the EU in addition to a summary on the domestic politics of the members.

In chapter 2, the European integration is reviewed from a theoretical perspective. In addition to Morgenthau's (1962) ideology of national interest, altruism and idealism, federalism and functionalism of the 1940s are included, concerning international relations and the EU's integration process. This chapter specifically concentrates on Monnetism that advocates federalism, essentially as a political goal. As one of the forerunners of the Community, Jean Monnet helped to establish the European Coal and Steel Community (ECSC).

The history of the EU, from the adoption of the Treaty of Rome

in 1957 to 1994, is reviewed in chapters 3, 4, and 5. In the first stage, which actually extends back to the Schuman Plan, inter-governmental coordination was essential in the structuring of Community politics. During this period, political cooperation, De Gaulle's union approach and the increasing power of the European Council have been extensively outlined. The second period, 1975-1989, is discussed in chapter 4. This period is evaluated as an optimistic era that led to the emergence of the European Union based on a concrete foundation. One of the main consequences of this period were the developments related to the establishment of the Eurofed and the creation of a single currency, and finally the possibility of transferring the national powers to the Community's institutions.

Following the first five chapters, the authors prefer to focus on the decision-making procedures and the common policies highlighted in chapters 6 to 12. Wood and Yeşilada, setting out from the distinction between the standard agenda consisting of the procedures required by the Rome Treaty and the EU regulations, and the unusual agenda including attempts for changing this regulation, have examined the European Council and the Chairman of the Commission setting the agenda in chapter 6. The next chapter takes a chronological glance at the developing macroeconomic policy coordination which has taken place in the European Monetary System (EMS), using the Exchange Rate Mechanism (ERM).

One of the most important subjects and, prior to the common policy of the European Community, is the Common Agricultural Policy (CAP). Regarding the external trade policies, and the Union's budget, chapter 8 discusses the inception and the subsequent progress of the CAP and its future structure.

Chapter 9 briefly addresses the regional, social and industrial policies, taking the relative effect of EMU into account. The European Regional Development Fund, the social charter, education and training, technological development, and the Environmental Action Program are specifically incorporated into the scope of the analysis to provide on overall assessment of the policies.

Chapter 10 offers a guide to the foreign economic relations of the Union with the U.S. and Japan comparatively, the impact of economic relations strengthened with the Mediterranean, African, Caribbean and Pacific countries and expansion of the Union in the global competitiveness of the European Common Market. In respect to the increasing power of the European Union in international economic and political arenas, its expansion with new members have been discussed in detail. In this section, particular attention has been drawn to the membership applications of Cyprus, Malta, and Turkey, since all three countries display some problems that the EU would not be in a hurry to welcome them. Although this section does not sufficiently include about the Customs Union, Turkey's situation differs from others.

Chapter 11 sheds light on the common foreign and domestic security policies. Evaluating the possible progress in external security matters, a subject commands the least consensus among EU members with regards to the Western European Union, the authors have concluded that EU members are not ready and enthusiastic to transfer their decision-making authority on defense issues, to a supranational organization such as the European Council and/or the European Parliament in the foreseeable future.

Finally, Chapter 12 is a summary emphasizing that the emerging and expanding EU has followed rather an irregular course of integration.

The book can be regarded as a political science text prepared especially for the scholarly-minded people, seeking to focus on a summarized chronicle of the EU, equipped also with new concepts and arguments on the subject of an emerging Europe.

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Artificial Intelligence in Finance and Investing, Robert R. Trippi; Jae K. Lee, Irwin: Chicago, 1996. pp.xxiii+246.

The application of computers to investment management in financial services industry is enhanced by technological advancements. Due to cost reduction, there is a rapid increase in the accessibility of the powerful computer hardware and software systems, by which, data may be analyzed in a more efficient and sophisticated manner.

This book, titled *"Artificial Intelligence in Finance and Investing"*, concentrates on artificial intelligence software systems and their applications in finance and investment portfolios.

Today, particulars pertaining to investment decisions can be stored, maintained, and updated by decision-making software and hardware systems known as *knowledge-based systems*. Although the *knowledge-based system* and *expert system* are often used interchangeably, they are not perfectly synonymous with each other. The crucial technology for a successful expert system is provided by a knowledge-based system.

This book intends to inform readers about the utilization of knowledge-based systems in portfolio management. The text is divided into 14 chapters. Chapter 1 introduces the concepts that will be discussed in the book. Chapter 2 begins with an overview of investment assets and the characteristics of securities markets and includes the theories of stock price determination such as *value-based investing* and the *Efficient Market Hypothesis*. After a brief introduction to portfolio selection, the optimization models; namely,

goal programming and *mean-variance optimization* are explained with a special emphasis on the Markowitz Model.

Following a general survey of knowledge-based systems, expert system applications in financial decision-making operations, especially in portfolio management processes are discussed in Chapter 4. This chapter distinguishes knowledge-based systems from expert systems according to their *auto-learning* capabilities. Auto-learning systems create the knowledge base themselves and they can be trained by a subset of actual data or test data. On the other hand, conventionally implemented *expert systems* require the input decision rules to be given explicitly. In addition, emerging artificial intelligence technologies such as neural networks, genetic algorithms, and case-based reasoning are also presented in this chapter.

The following three chapters deal with the representation of knowledge relevant to investment decisions and the evaluation of stocks and other securities on a knowledge base.

Chapter 5 provides the basic elements, common to most knowledge-based systems and it discusses timing and allocation decisions of portfolio management systems. Chapter 6 describes the knowledge representation systems and focuses on the rule base and the database systems. Methods for handling uncertainty are explained in chapter 7.

The topics covered in chapter 8 include knowledge acquisition, integration and maintenance. Chapter 9 provides the applicability of *machine learning* in portfolio selection.

The artificial neural networks, simulating the functioning of the human brain, compute in a massively parallel manner and are easy to be constructed. Chapter 10 focuses on the architecture and learning in *neural networks*. This chapter presents a comprehensive guide to the neural network applications in the context of stock price prediction. Chapter 11 introduces the mechanism for integrating knowledge with the mean-variance optimization model (1952).

Chapter 12 develops database and knowledge base technology and evaluates the integration of knowledge with securities, corporate information and industry database. The concept of a

function base is also introduced in this chapter. Chapter 13 provides a portfolio which is constructed by applying knowledge and investor preferences to the Markowitz Model and illustrates the *K-FOLIO system*. Chapter 14 incorporates a summary and suggestions for future research. It briefly addresses the key system design issues for increasing effectiveness in the management of investment portfolios.

"Artificial Intelligence and Investing" provides insight to potential investors about the benefits of artificial intelligence implementations in portfolio construction and constitutes a basis for the development of more advanced expert systems. We think that this book will be useful for portfolio managers, institutional investors, investment analysts and information systems professionals in their attempts designed to improve investment performance.

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