

Protecting Investors and Lessening Moral Hazard in Capital Markets by Using Mobile Communications and Internet Technologies and the Role of Central Registry Agency of Turkey

Yakup Ergincan*

Abstract. This paper aims to discuss and recommend security systems for protecting investors' assets against misuse or fraud by intermediary institutions when Turkish capital market transforms to dematerialized system where rights for capital market instruments will be kept in electronic book-entry form by the Central Registry Agency of Turkey (CRA). It also discusses the possibility of moral hazard and breach of trust by the intermediary institutions following the commencement of the Investors' Protection Fund, and the probable functions of CRA to avoid moral hazard and breach of trust risks by the help of mobile communications and internet technologies. In that framework, two very important and innovative recommendations are made for the first time which would enhance investors' confidence and change the system of supervision for the capital markets in the world dramatically.

JEL Codes: G20.

Key Words: Internet technology, capital markets, Central Registry Agency of Turkey

1. Introduction

In the last two decades a couple of intermediary institutions in Turkey became illiquid or bankrupt due to lack of back office infrastructure for book-keeping, inadequacy of internal control, or frauds committed by their staff thus causing various undue risks on customers' assets¹ kept in custody by those intermediary institutions.

* Central Registry Agency of Turkey, Director, Department of Dematerialization System
Phone: (212) 334-5700 Fax: (212) 334-5757, e-mail:yakup.ergincan@mkk.com.tr

¹ Asset means securities and cash which belongs to investors.

While surveillance by the regulatory authorities and “control by investors” are defined as “precautionary measures” in the management of the afore mentioned risks, there are also “protective measures” such as Investors’ Protection Fund, insurance systems or self safe keepment of assets by their owners in their vaults. In this sense, although regulation, surveillance and inspection are extremely important, they should not be overestimated as effective precautionary measures as the “control by investors” mechanisms which are defined as verification of the customers’ assets by themselves. Safe custody of investors’ assets requires strict check-up mechanisms by both the owners and the authorities.

Deterioration in the financial health of the intermediary institutions has been seen to be one of the main reasons for the unauthorized utilization of customers’ assets. Some of the most important reasons of deterioration of financial health of intermediaries are operations in violation of laws and regulations, fraudulent transactions and risky transactions/investments that may or may not be within the legal framework. Due to the delayed discovery of the unauthorized utilization of the customers’ assets, almost all of the customers’ assets in those institutions vanished and consequently thousands of investors lost millions of US dollars in the last decades. This illustrates the need for a well-designed “control by investors” system to monitor and detect breach of trusts committed by intermediary institutions. Hence, no matter how much or how qualified are the surveillance and inspections done by the regulators, the risk still remains. Furthermore, an increase in the unauthorized utilization of customers’ assets might be expected due to the moral hazard problem created in the capital market by the commencement of the Investors’ Protection Fund.

2. Custody and Protection of Immobilized Stock Certificates

Authorized by the Capital Market Board (CMB), Takasbank is the "Central Securities Depository of Turkey" for stock certificates. According to the CMB regulations, no institution other than Takasbank is permitted to safekeep physical certificates of securities in Turkey.

As Takasbank is both the Central Securities Depository of Turkey and the Clearing and Settlement Center for Istanbul Stock Exchange (ISE) trades, the CMB requires all ISE members to have one main (omnibus) custody account in their names and sub-accounts for each of their customers at Takasbank. After 1994 economic crisis in Turkey, some intermediary

institutions failed or went bankrupt which led to great losses for investors whose assets had been misappropriated and sold by these institutions. As a result, CMB urged the industry to open sub-accounts for each investor in the Takasbank system, instead of keeping them all in one omnibus account, so that their customers' assets can be recorded separately. In 1995, Customer Based Custody System was implemented where intermediary institutions' deposit accounts were kept with a breakdown with respect to individual customers' account numbers. In 1997, this system was converted to Customer Name Based Custody System (CNBC System) where customer identity information is also included on each account. Each ISE member is connected to Takasbank's system via leased data lines through which they can monitor and make transfers between their custody (pool) accounts and their customer's sub-accounts from their own office terminals.

Identity information of the sub-account holders (customers of the ISE member intermediaries) have been gathered by the intermediaries and entered into the computer system already. Each customer (real or legal entity) in the system is assigned a unique Customer Number. With this system, investors are enabled to monitor and check their holdings as a whole, even if they have accounts with more than one ISE member. Investors are also able to put and release blockade on their securities holdings. The major aim of that service is to increase the confidence of the investors in the system as a whole. This system provides both the CMB and the ISE with a more effective means of supervision.

It is of great importance for the investors to check their accounts at the Takasbank CNBC System whenever they deliver physical certificates or purchase them through ISE. Since 1994, thousands of investors had great losses due to failed and bankrupt intermediary institutions. As stated above, the matching book-entry records of the physical certificates delivered or purchased by the investors are kept in the Takasbank CNBC System and the transactions on them are carried out by intermediary institutions. Therefore, "control by investors" is very important to ensure that the stocks they delivered to the intermediary institutions or purchased through ISE are properly recorded in the Takasbank CNBC System by their intermediaries. Takasbank provides an Interactive Voice Response system (IVR) called "Alo-Takas", through which the sub-account holders are able to reach real-time information on their accounts, get one consolidated custody account statement even if they have more than one account under different intermediary institutions. Furthermore, since 05.31.1999 investors can block

their accounts entirely or partially using passwords provided previously by the Alo-Takas System² which aims to prevent intermediary institutions from unauthorized uses of investor accounts. This system also helps internal control of intermediary institutions for detection of the frauds committed by their staff [Sermaye Piyasası ve Borsa Temel Bilgiler Kılavuzu (2003:362-365)]. However, the utilization of Alo-Takas system has been minimal. The number of investors using the system is less than 3,000 whereas the number of all investors in Takasbank CNBC System is almost 1.2 million. The reasons behind this low usage ratio are said to be the difficulties of sending Takasbank Customer Numbers and Passwords to the investors, the over trust of investors in their intermediary institutions, and the insufficient marketing of the system and its benefits to the investors³. In addition, usually investors apply to their intermediary institutions instead of CMB or ISE whenever an inconsistency regarding their accounts emerges. As a result, recurring breach of trusts and unauthorized utilization of investors' assets could not be noticed in the early stages.

3. Moral Hazard and Investors' Protection Fund (Fund)

In the last decade, almost 50,000 investors have realized losses in the amount of \$150 million due to the intermediary institutions which failed to meet their commitments to their customers⁴. In this period, as a result of the

² In August, 2003, Takasbank launched TakasNet which provides the same services with that of Alo-Takas through internet by which investors can get reports regarding their accounts and put blockade to their accounts by connecting to Takasbank web site.

³ Every type of account blockade including "Investor Blockade" enables investors to protect their accounts against misuse by the intermediary institutions. However, blockades, specially Investor Blockades sometimes create problem for intermediary institutions which fully complies with legislation since an investor who sells his stocks at the trading date but does not remove Investor Blockade till the end of settlement date can cause this institution to default for its stock delivery debts against Takasbank. Therefore, blockade can increase investor asset safety but can cause operational and financial risks for intermediary institutions. As a result, along with blockade systems, a central depository institution which informs investors instantly about the status of their accounts and their transactions would both increase investor confidence and eliminate these kinds of operational and financial risks for the intermediary institutions.

⁴ Kılıç, has determined that the number of the investors of whose receivables could not be fulfilled by the failed intermediary institutions is 23,000 and the amount of the commitment is \$121 million as of April 1996. By the information which has

supervision of the CMB, it has been determined that the financial status of more than 30 intermediary institutions had seriously been weakened and they were required to strengthen their financial status within a reasonable time period. Some of them have lost their intermediation licenses and for some of them bankruptcies were requested by the CMB due to their unconformances to the requirements to strengthen their financial status⁵.

In that period, on the average 3 intermediary institutions fell into payment difficulties annually and thousands of investors suffered from these circumstances. On these grounds, it appears that the existing surveillance system and “Alo-Takas” mechanism can not provide a full safety for the system. As a result, it is obvious that more advanced and practical “control by investors” mechanisms are required so as to provide more efficient security for the customers’ deposited securities and cash.

The dictionary⁶ definition of “moral hazard” is a disposition on the part of individuals or organizations to engage in riskier behavior, than they otherwise would, because of a tacit assumption that someone else will bear part or all of the costs and consequences if the incurred risk turns out badly. Similarly, but somewhat more formally, moral hazard is defined in the economics literature as: “actions by economic agents in maximizing their own utility to the detriment of others in situations where they do not bear the full consequences . . . of their actions.”

According to Wolf (2002:19-20), moral hazard is certainly not unique to the financial domain. Indeed, it occurs in many aspects and stages of quotidian life. For example, a child may be more disposed to get into one or another kind of trouble if he believes that her parents will get her out of it;

been gathered from the relevant institutions, it is estimated that after 1996, due to the intermediary institutions which failed in payments, these figures reached to 50,000 investors with a loss amount of \$ 150 million.

⁵ The intermediary institutions which have fulfilled their commitments partially or behind the schedule and which have acquitted for some of the credits of the aggrieved investors which have suffered from the problems arising from the internal verifications of the intermediary institutions (which means the statistics of the suffered investors could not be reflected to the outsiders) or the examples that the losses of the investors have been compensated by the major shareholders of the intermediary institutions, have not been taken into consideration in calculation of the said numbers.

⁶ *The New Palgrave: A Dictionary of Economics*, Vol. 3, 1987, p. 547.

an adolescent may occasionally overspend his allowance because of prior experience that his parents, perhaps contrary to their expressions of intent, will bridge the gap. The phenomenon of moral hazard is also pervasively associated with insurance policies and the behavioral effects they may have. For example, automobile liability insurance may in some cases conduce to less careful driving, and fire insurance on a home perhaps reduces incentives to substitute less flammable for flammable materials, such as tile roofing in place of wood shingles. And even health insurance may sometimes result in excessive utilization of health care services, or in avoiding preventive care, or deferring changes in life-style that would reduce the need for health care. However, there are at least two important differences between some of these insurance transactions and the moral hazard phenomenon in the financial context. First, in the case of insurance-induced moral hazard, the premiums paid for policies represent a cost paid by the insured that is not directly matched to rescue insolvent or illiquid debtors. Second, it is frequently, though not uniformly, the case in insurance transactions that premiums are based on performance and experience, so that the effect of moral hazard on the behavior of insured parties may raise their subsequent premium costs if indeed the frequency of their requesting insurance claims rises above actuarial calculations.

Ross (1974) asserts that it has been observed that the key distinction between man and machine is moral hazard. According to Thakor and Greenbaum (1995:31), who first introduced the concept in the insurance literature, this term is used to describe situations in which the incentives of principal (the employer or the owner of the property) and agent (the employee or the person renting/using the property) diverge. A rational economic agent can be expected to maximize his own utility, and where his self-interest conflicts with the principal's, the principal will suffer. The principal must therefore design a contract that will achieve a congruence between her goals and the agent's.

According to Brealy and Myers (1996:709), once a risk has been insured, the owner may be less careful to take proper precautions against damage; insurance companies are aware of this fact and factor it into their pricing. If it were possible to costlessly observe the agent's actions, there would be no moral hazard. If an insurance company could precisely observe the insured, it would simply prohibit all actions detrimental to the insured item. Thus, for moral hazard to arise, it must be that: (i) the agent's actions (that affect the final outcome) cannot be costlessly observed by the principal, and (ii) there must be some noise (exogenous uncertainty) that masks the

agent's action in the final outcome. It is important to understand that moral hazard is not the same as fraud. Most interesting cases of moral hazard do not involve illegal behaviour. It is not illegal for shareholders to take on riskier projects than the bondholders would like. Nor is it illegal for a manager to invest in projects with faster paybacks than shareholders would like. Moral hazard may involve fraud, but it need not.

Savings Deposit Insurance Fund which exists to diminish the expanding impacts of the crisis in the banking sector and to prevent the continuous bankruptcies of banks produces two counterproductive results: First, it leads the banks to undertake more risky investments (moral hazard problem), and, second, owners/managers prefer to profit by using the banks' resources themselves, through the companies they own, even if that leads to bankruptcy. The costs mostly occurring in the two adherent conditions are assumed by public. Making more public announcements in order to solve the problem or applying more effective accounting standards are both preferable. However, punishing the banks through deposit withdrawal or asking more interest will not be effective since the banks do not change manageable risks due to insufficient risk assessments with the expressed informations giving faith to deposit guarantee [TBB Bankacılık ve Araştırma Grubu (2002:11)].

The guarantee funds in the world are used for paying the partial obligations of intermediary institutions to their customers. These types of funds' resources are generally contributed by the market participants. The guarantee funds also have disadvantages such as bringing additional costs to the institutions with little risk of failure and encouraging to take more risks (moral hazard). Notwithstanding they have advantages since their management is independent from the management of the institutions with failure risks, costs are distributed among the market participants; and a certain part of the customers' assets are held under protection. The fact that the customers' assets are insured in a sense and that in case the compensation payments would be made with the funds of public sources would encourage the owners and managers of the financial institutions to take higher risks. The situation that the expected return is not worth the risk taken will lead them to use the assets without the customers' approvals.

According to Kilic (1997:31), moral hazard is derived both from the attitudes of the owners and managers of the intermediary institutions and from those of the customers. On the one hand, the owners and managers of

the intermediary institutions depending on the guarantee fund or abusing it get higher risks; on the other hand, the investors who are aware of the guarantee fund and prefer to get higher yields do not take proper care when making decisions. A good example for moral hazard in the banking system is the situation before the 2000 and 2001 crises in Turkey. By depending on the guarantee of Savings Deposit Insurance Fund, banks had taken excessive risks and offered above average interest rates to the depositors whereas investors did not consider the risks but only the returns which eventually caused higher costs for both the economy and to the public. Muslumov (2003:25-26), in his paper, analyzed the effects of deposit insurance system on the financial performance of Turkish commercial banks using experimental design approach. The research findings support the moral hazard hypothesis. Findings indicate that domestic private commercial banks show significant increases in credit risk, foreign exchange position risk, liquidity risk, and agency costs relative to their benchmark after the introduction of 100 percent deposit insurance system. He relates this excessive risk-taking to the moral hazard behavior by commercial banks. The smaller commercial banks which are more vulnerable to moral hazard problem experience significant increases in agency costs. The research results indicate that 100 percent deposit insurance system distorts the incentive structure of commercial banks and thus hampering; proper functioning of market discipline mechanism and leads to excessive risk-taking.

A similar example can be given for capital markets too. Counting on Investors' Protection Fund, investors who hand over their assets to the intermediary institutions to be delivered to Takasbank without considering the riskiness of the institution and who then do not check their accounts in the CNBC System are good examples for moral hazard in the capital market. Another example would be the probable frauds of the owners or staff who takes excessive risks and utilize the investors' assets by knowing that the fund would compensate the investors anyway in case of a bankruptcy. Even the existence of the fund may be encouraging for such people to take excessive risks relentlessly⁷.

As stated in the legal grounds of the Capital Market Law (CML), the main purpose of establishing the Fund is to construct a system to prevent the

⁷ Similar moral hazard problems exist for banks due to Savings Deposit Insurance Fund. For a discussion see, Karacan, Ali İhsan. (1996) "Bankacılık ve Kriz" *Finans Dünyası Yayınları* No:1, pp. 122-124.

securities and cash damages arising due to weakness of the intermediary institutions' financial status. In this scope, cash payment and share delivery obligations of the intermediary institutions for which a gradual liquidation or bankruptcy decision is made, shall be paid by the Fund in the limits determined by the CML. The upper limit for year 2004 was determined as 36.6 billion TL for each investor.

Although it is not easy to state that the moral hazard is apparent in two intermediary institutions which were taken over by the Fund, the existence of the Fund is likely to contribute to constituting moral hazard problems as seen in other cases in the world. In the capital markets in which surveillance and inspections are not as effective as "control by investors" mechanisms, the significance of setting up new "control by investors" mechanisms and using them effectively is very much on the map now. As a result of the lack of necessary effective surveillance and "control by investors" in the market where the moral hazard problem exists, unauthorized utilization of investors' assets may ensue and the Fund with incomes of public origin would have to compensate the losses of the aggrieved investors.

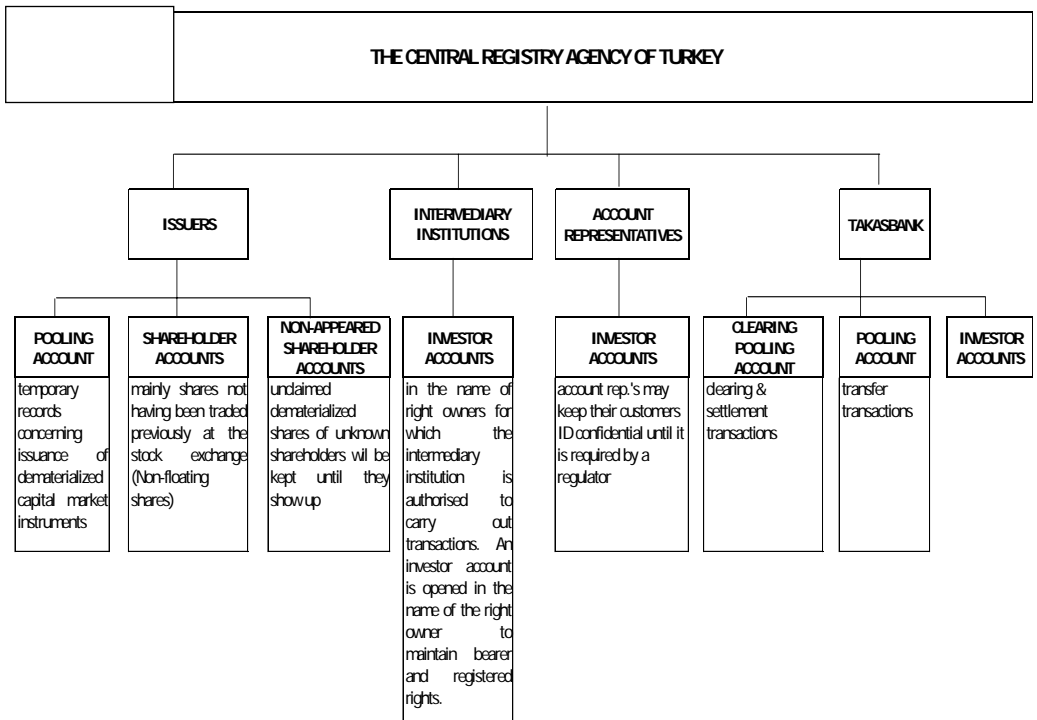
4. Central Registry Agency (CRA) and Dematerialized System

According to Article 10/A of CML No.2499 ammended by means of the Law No. 4487., records on capital market instruments and rights related to them shall be kept in book entry form by the Central Registry, which is a legal entity under private law. According to *the Regulation Concerning Incorporation, Operation and Supervision of the Central Registry* (CRA Regulation) which has been based upon article 10/A of CML, CRA shall be incorporated in the form of a stock company with the objective of operating in accordance with the law and regulatory provisions. CRA started operations on 09.21.2001 with founder shareholders; Istanbul Stock Exchange, Takasbank, The Association of Capital Market Intermediary Institutions of Turkey and Istanbul Gold Exchange. "*Communique About Terms And Conditions Governing Book-Entry Recording Of Dematerialized Capital Market Instruments*" (Dematerialization Communique) was drawn up in 12.22.2002 which aims to regulate terms and conditions of book-entry recording processes of capital market instruments and rights.

The system of settlement and the custody of the capital market instruments and records of the related rights thereon will go into a radical reform with dematerialized system as envisioned by the article 10/A. This change and its benefits stated in the legal ground of the Article as; *“in the scope of the transparency of the capital markets, the most serious and radical reform operations have been in progress. The dematerialization of the capital market instruments will eliminate the certificate issuing for the securities, it will also reduce costs of the issuers at public offerings and capital increases. The shares which both offered or not offered to public and the shareholders information of the the publicly held companies will be monitored more efficiently. Registering the securities in a book entry form will eliminate the risks of theft, lost, forged stock issuance and physical damage for the certificates. It will simplify the process of the dividend payments and increase of capital and save time and effort. The dematerialization of the securities and keeping them in book entry form will bring easiness to the settlements and reduce defaults. As a result, with dematerialization of the capital market instruments, security, transparency and depth of the capital markets will be increased...”*

Membership and Account Structure of the CRA according to the Dematerialization Communique is illustrated in the following figure:

Figure.1: Membership and Account Structure of CRA



5. Recommendations for Increased Security in the Capital Market: Investor Alert System and Investor Information System

As stated above, CRA will keep records on capital market instruments and rights related to them in book entry form electronically with respect to issuers, intermediary institutions and owners. However, the system designed for dematerialization resembles the existing system with physical certificates. In dematerialized system, CRA members, rather than rightowners (except the transactions like investor blockade), has the authority and responsibility to create and amend records. Therefore, the fraud risk by the members would continue in the dematerialized system as it is in the physical certificates system. That's why CRA's functions regarding investors protection -which would be effected by keeping critical information for millions of investors including capital market instruments and their transfers, identity, address and communication (phone, cellular phone and e-mail address) information- should be taken into consideration seriously. By using modern technology and combining it with the information kept in the CRA Dematerialized System Database, a very effective investors' assets protection system based on "control by investors" approach could be implemented. Considering that after year 2007, no investor would be able to keep his/her capital market instruments in physical certificate form and would be required to deliver them to the CRA to be dematerialized, the importance of investor asset protection mechanisms would be better understood.

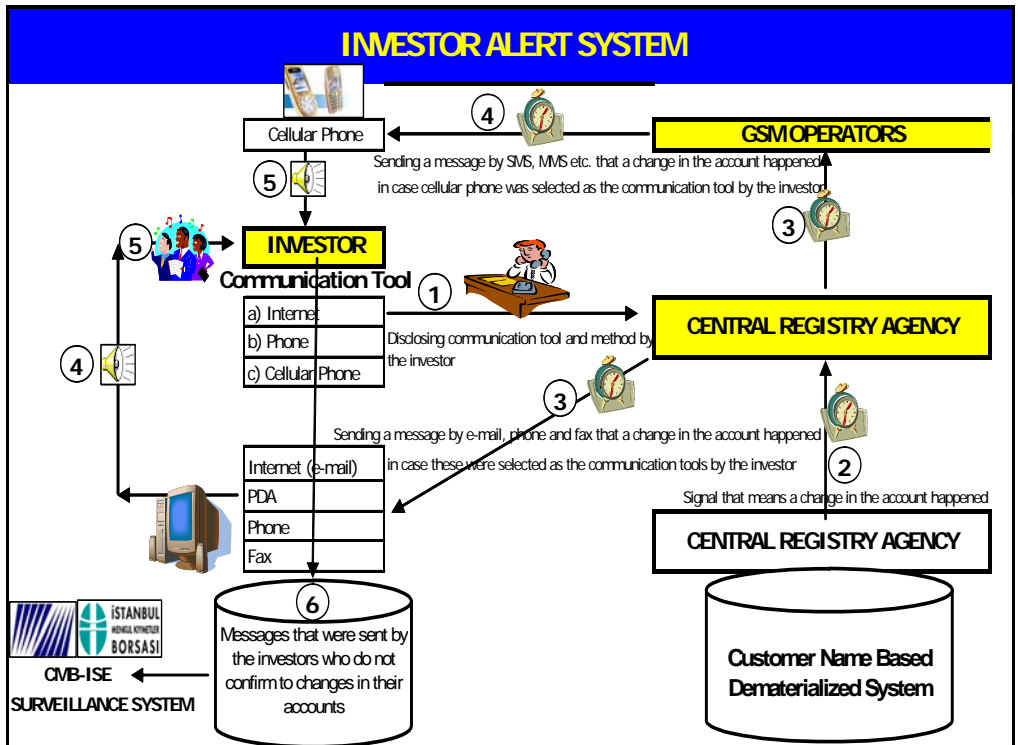
Besides informing investors by Alo-Takas (IVR) and TakasNet (Internet) like services about their assets kept at the CRA, a well-designed call center would be of high importance to satisfy the informative needs of the investors. However, in addition to these kinds of communications based on investor call (in which investor has to call CRA or log on CRA website), an innovative communication method based on CRA call (in which CRA calls or sends e-mail to the investor for specified information) would be more effective in terms protection. Recommendations on such innovative communication and information methods that use mobile technologies and internet are given in the following sections⁸.

⁸ The main logic underlying the recommended systems is to reach thousands of investors at the same time by CRA. Even though internet penetration rate in Turkey is very low, cellular phone penetration rate is very high which would allow CRA to send information through cellular phones efficiently and quickly.

5.1. Investor Alert System Recommendation

The first service that would be implemented by the CRA for sustaining “control by investors” would be **sending an alert message** to the investors **when a transaction is made on their CRA accounts**. This could be rendered by all available electronic communication tools including mobile communication tools, mainly cellular phones (SMS, MMS and etc.), internet (e-mail, web etc.), and other communication tools (PDA, fax and etc.). Figure illustrating this process is given below:

Figure.2: Investor Alert System



As stated above, the service provided by this system is to send an alert message to the investor by SMS or e-mail⁹ through CRA system if a change occurs in his/her CRA accounts. By just sending an alert signal, “*A Change in Your Account Happened in CRA System*”, immediately when a change occurs, the investor would be informed instantly.

According to an analysis covering all the foreign central depository or registry institutions, it is understood that this service would be the first and only in the world. That’s why it is very important to launch this service which would increase investor confidence practically as soon as possible.

By this service:

- An investor would be informed by CRA by SMS or e-mail regarding the transactions in his/her account held in the CRA databases.
- Capital Market Industry would be much safer for the investors since it would provide “control by investors” mechanism against fraudulent activities and wrongdoings of the intermediary institutions. An investor who gets such a message and does not know the reason of or confirm to the change would apply to the authorities and would either prevent a crime to happen or correct a mistake done by the intermediary institution.
- If integration to CMB-ISE Market Surveillance System Project is sustained, system safety would enhance. In the context of Investor Information System recommended below, if s/he does not confirm to the signal, s/he would get his/her account statement immediately from the CRA system by just sending an SMS or an e-mail to CRA. Then, s/he would send a message by SMS or e-mail to CRA Message Pool when s/he disagrees with his/her account statement. CRA would direct those kinds of messages to the CMB-ISE Market Surveillance System. As these messages gather for a specific intermediary institution, this would point to a probable problem for this specific institution which should be taken care of by CMB or ISE.

⁹ SMS and e-mail term is used in this study to mention every electronic communication tool from mobile communication tools, specifically cellular phones to internet, specifically e-mail. By the help of innovative technologies modern communication tools like WAP, MMS and PDA’s would be in use.

- Probable misuses or frauds by intermediary institutions would be prevented which would lead to the enhancement both in the protection of investor assets and confidence in the system. That would easily be accomplished since an intermediary institution which acts against regulations would not be able to maintain the accuracy of all the investor accounts and pay settlement debts to Takasbank at the same time.
- The likelihood of breaches of the law by intermediary institutions, specifically breach of trust, would be lessened which in turn would lead to much safer brokerage and custody system for the investors.
- Economic losses inflicted by the institutions acting against law on thousands of investors amounting to millions of USD would be minimized.
- The possibility of moral hazard in the capital market and the burden on the Investors' Protection Fund would be lessened.

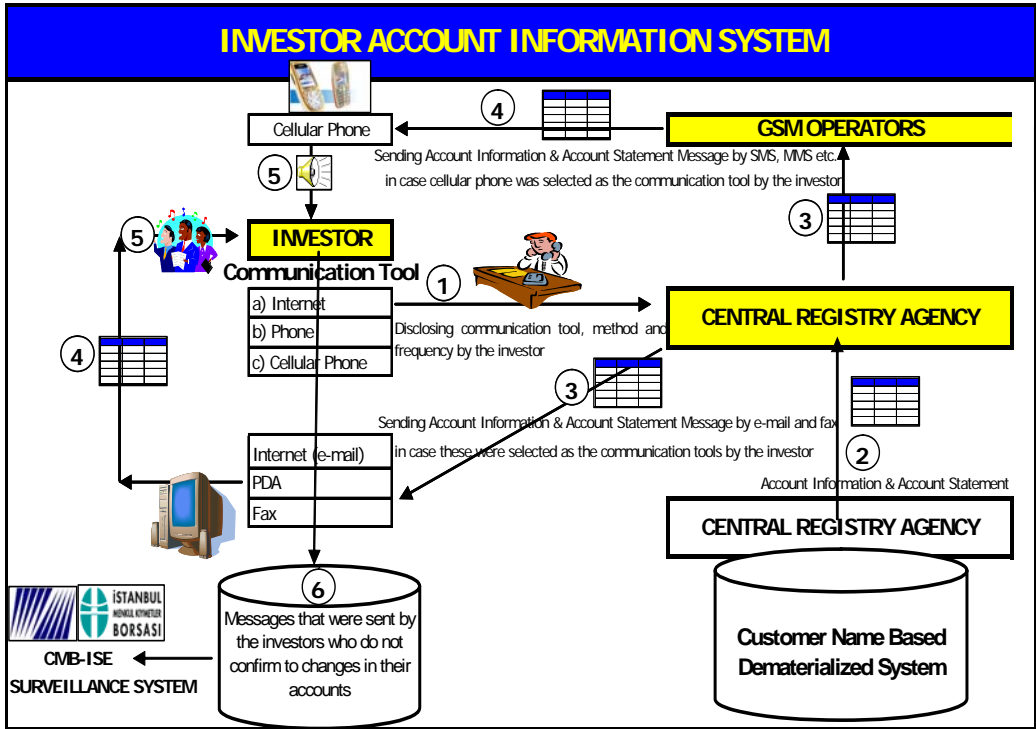
5.2. Investor Information System Recommendations

Investor Information System is mainly composed of two parts, informing investors of their accounts and informing investors regarding their stock exchange orders and trades.

5.2.1. Investor Account Information System

The second service that would be implemented by CRA for sustaining “control by the investors” would be to **send account statement and account transaction information** to the investors **according to their preferences (daily, weekly, monthly etc.)**. This could be rendered by all available electronic communication tools including mobile communication tools, mainly cellular phones (SMS, MMS and etc.), internet (e-mail, web etc.), and other communication tools (PDA, fax and etc.). Figure illustrating this process is given below:

Figure.3: Investor Account Information System



As stated above, the service Investor Account Information System provides is to send a message to the investor by SMS or e-mail through CRA system regarding their account statement and account transactions of the capital market instruments kept in CRA database.

In addition to the benefits that would be rendered by the investor alert system, by this service:

- Investors would be able to get information regarding their portfolios depending on the preferences they could make by connecting to CRA system or whenever they need.
- Integrity and consistency would be effected by informing investors through one agent. To do so, besides the securities information kept in their accounts, CRA can also inform the

investors regarding their cash accounts and account transactions¹⁰ as disclosed by the intermediary institutions.

- The cost of informing investors, which is calculated to be millions of USD, due to regulation or investors' demands would be minimized. Therefore, informing investors from one center would be less costly, more efficient, and immediate which would also lead to economics of scale. Replacing printed postage with SMS and e-mail would minimize costs radically.
- Operational costs of informing investors would be decreased by releasing them from applying to every institution they have accounts with, since CRA would be able to inform an investor once even though s/he has accounts in more than one institution.
- Enhanced "control by investors" mechanism together with Investor Alert System would be sustained.

On the other hand, CRA could send account statement information to randomly selected investors by SMS or e-mail messages. Depending on the appropriateness of selecting the ideal sample of investors, a cross-check for the whole system could be completed. As the number of investors included in the sample increases, the probability of discovering a mismatch would increase which would lead to greater safety for the system.

Moreover, letting investors to blockade their accounts by using cellular phones and internet would enhance the system safety.

5.2.2. Investor Order and Trade Information System¹¹

Since 03.03.2003, orders can be entered into to the ISE Stock Trading System only with investor account numbers by intermediary institutions. Therefore, the investor account number along with buyer and seller institution code is being recorded instantly. Every time a transaction is made,

¹⁰ Keeping and reporting gross buying and selling and cash account information are not declared as CRA's duties. That's why information would be made possible by mentioning the intermediary institution's responsibility.

¹¹ According to our analysis covering all the foreign central depository or registry institutions, it is understood that if rendered by CRA this service would be the first and only that is rendered by a central depository or registry institution in the world.

the parties of the transaction are known by ISE. After the trading day, intermediary institutions can make corrections in the order and trading book in terms of the customer account number since during the trading process, there is a possibility of entering wrong customer account numbers. The average correction rate is between 5% and 10%. Although the correction rate is significant, 90% of accuracy can be regarded as satisfactory. Therefore, since CRA would have investor identities along with their e-mail address and phone numbers, it would be possible to get the order and trading information including the price and quantity information instantly from ISE¹² and send messages to the investors by SMS and e-mails as soon as an order is entered and a transaction is completed for their accounts in the ISE system.

As a result, an investor would have a chance to know every transaction regarding his/her account instantly. This would be an immediate signal for the investor to intervene if s/he does not agree with the price, quantity or even the transaction itself. Since settlement is done two days after the transaction is made, an investor would have 2 days to intervene into the transaction. So, this service would stop or lessen the possibility of misuse of investor accounts by the intermediary institutions which would also serve to increase confidence of investors in the system.

6. Conclusion

Weakness in the financial structures of the intermediary institutions is one of the main reasons for an unauthorized utilization of customers' assets. Due to the late discovery of the unauthorized utilization of the customers' assets, tens of thousands of investors lost millions of US dollars in the last decade. This illustrates the need for a well-designed "control by investors" system to monitor and discover breaches of trust committed by intermediary institutions. No matter how much or how qualified the surveillance and inspections are done by regulators, the risk still remains. Furthermore, since Investors' Protection Fund is in operation, an increase in the unauthorized utilization of customers' assets might be expected due to the moral hazard problem in the capital market.

¹² ISE endorsement is necessary for CRA to launch this service since according to the legislation CRA is not authorized to keep these records.

The dematerialized system where the certificates for capital market instruments will be recorded by CRA in electronic book-entry form with rights related to them with respect to issuers, intermediary institutions and owners is going to resemble the existing physical certificates system in terms of intermediary institutions operations. CRA would keep critical information for millions of investors including their capital market instruments and transfers, identity, address and communication (phone, cellular phone and e-mail address) information in book-entry form. However, CRA members rather than right-owners have the authority and responsibility to create and amend records. Therefore, the fraud risk by the members would continue in the dematerialized system as it is now in the physical certificates system. That's why, CRA's investor protection functions should be taken into consideration seriously. Besides communications based on investor call (in which investor has to call CRA or access CRA website), an innovative communication method based on CRA call (in which CRA calls or sends e-mail to investors for specified information) would be more effective in terms of investor asset protection.

In that context, the services to be implemented by CRA for sustaining "control by investors" would be to (i) send an alert message immediately when a change occurs in their accounts, (ii) send account statement and account transaction information according to the preferences (daily, weekly, monthly etc.), and (iii) send ISE order and trading information instantly to the investors mainly by SMS or e-mail.

According to an analysis covering all the foreign central depository or registry institutions, it is understood that such services would be the first and only in the world. Since an intermediary institution would not be able to maintain the accuracy and consistency of all the investor accounts and pay settlement debts in terms of capital market instruments to Takasbank at the same time, by rendering this service CRA would enhance both the protection of investor assets and confidence in capital market industry.

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