

# Successes and Failures of Compulsory Risk Mitigation: Re-evaluating the Turkish Catastrophe Insurance Pool

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# **Successes and Failures of Compulsory Risk Mitigation: Re-evaluating the Turkish Catastrophe Insurance Pool**

## **Abstract**

The Turkish Catastrophe Insurance Pool (TCIP) is a unique public-private partnership designed to reduce economic losses from disasters. This paper reviews the application of this compulsory mechanism along with data relating to the performance of the scheme following recent earthquakes in Turkey. We also consider the current perceptions of Turkish society towards the TCIP and how they can be enhanced. Our conclusions aim to assist stakeholders in government, homeowners, insurance companies, media, banks, and civil society to appreciate the value of the system and key actions necessary to improve it.

**Keywords:** catastrophe, earthquake, insurance, mitigation policy, Turkey

## Introduction

Turkey is one of the most earthquake-prone countries in the world. A major earthquake of magnitude 7 has been postulated to occur within the next 20-25 years in İstanbul within the probability range of 30-60 % (Michel-Kerjan, 2013; Barnes, 2010; Parsons, 2004). However, until the major earthquake that struck near İzmit, Kocaeli in 1999, nearly all risk management strategies had been based on “post-disaster rehabilitation” rather than “mitigating possible losses from future disasters or being prepared for possible losses” (see Freeman and Kunreuther, 2002, for a more detailed discussion). After 1999, the Turkish government became aware of the fact that without any preparation before the disaster occurs, it is almost impossible to reduce the loss from earthquakes. For this reason, insurance, one of the best-known financial mitigation tools, was employed to compensate the monetary losses caused by natural disasters and the “Turkish Catastrophe Insurance Pool (TCIP)” was launched in September 2000. This effectively created a market insurance mechanism that transferred a national risk to an international one through sharing pools under the management of international reinsurance companies. TCIP uniquely combines public and private resources and has proved to be an exemplary financial risk reduction mechanism that has been followed by other seismically vulnerable countries such as Romania and Taiwan.

This study examines the perceived “successes” and “failures” of this compulsory earthquake insurance (CEI) system in Turkey. The aim is to provide condensed information and some suggestions to policy makers regarding the current status of this mitigation measure and what can be done to improve the system. The TCIP’s performance is reviewed in terms of its current application processes, regulatory structure, claims history and payments. The study also explains how this insurance system was applied following two recent major

earthquakes that struck the province of Van in October and November 2011. We also review the findings of previous studies that investigated various aspects of TCIP's performance.

In the next section we describe the earthquake risk in Turkey followed by details about the aim, coverage, and administration of the Turkish Catastrophe Insurance Pool. Then, some important issues that can be considered as successes or failures are discussed. Accordingly, the final section expresses some suggestions with policy implications.

### **History of Earthquakes in Turkey**

Turkey is located in one of the most seismically vulnerable areas in the world. Nationally, 64 percent of losses from all disasters are caused by earthquakes. In comparison, 16 percent of losses are caused by the landslides, 15 percent by floods, 4 percent by the fire, and 1 percent by disasters caused by meteorological events (TBMM, 2003).

Previous earthquakes in Turkey have proved how harmful these events can be to society and the country's economy. A brief summary of recent earthquakes that have effected urban areas in Turkey is presented in Table 1 with the dates, magnitudes, and negative effects of these disasters. Accordingly, the Kocaeli earthquake, which occurred in August 1999 near Izmit, was the most significant disaster in recent history. The earthquake had a moment magnitude of 7.4  $M_w$  that resulted in a death toll of 18,373 and injuries to another 48,901 people. Reportedly, 93,000 housing units and 15,000 small business units collapsed or were badly damaged (Bakir and Boduroglu, 2002; Erdik and Durukal, 2003). In November 1999, another earthquake of magnitude 7.2 struck Düzce, near Bolu. Düzce is located between the two principle population centres of Turkey, Ankara and İstanbul. As seen from Table 1, the number of fatalities from this event was 812 people. The impact of this earthquake was magnified due to the failure of structures erected without reference to adequate building

codes and the widespread use of substandard construction materials. Post-disaster assessments found significant defects in construction that compromised the strength of the buildings. Many of these defects were indicative of profiteering and a widespread lack of supervision and professional control.

**Table 1** History of Earthquakes in Turkey 1992-1999 (Gülkan, 2002)

Date	Event	Magnitude ( $M_w$ )*	Number of fatalities	Number of heavily damaged dwellings	Number of total collapse	Number of homeless	Estimated economic loss (billion USD)
13.3.1992	Erzincan Earthquake	6.8	645	8000	1450	8000	0.75
01.10.1995	Dinar Earthquake	6.1	100	6500	2043	NA	0.25
28.06.1998	Adana- Ceyhan Earthquake	6.2	150	21,000	2000	24,000	0.5
17.08.1999	Kocaeli Earthquake	7.4	>18,000	320,000	26,000	600,000	>20
12.11.1999	Düzce Earthquake	7.2	812	10,100	800	NA	1

\*Magnitudes of earthquakes are obtained from the Disaster and Emergency Management Presidency Department of Earthquake website (<http://www.deprem.gov.tr/sarbis/Veritabani/DDA.aspx?param=3>)

The impact of the 1999 earthquakes highlighted the need for effective disaster risk management strategies. Prior to Kocaeli, the focus had been on post-disaster rehabilitation rather than strategies that would help to mitigate possible losses in future disasters (see Freeman and Kunreuther, 2002). The tremendous loss in 1999 forced the Turkish government to seek and apply pre-disaster risk reduction measures such as: (1) supporting research in the

area of earthquake engineering, (2) raising public awareness of earthquake risk through research and the media, (3) establishing a system for distributing international and domestic aid in case of a disaster, (4) implementing indirect taxation to raise funds, and (5) issuing a compulsory earthquake insurance policy to transfer the financial risks of future earthquakes to other domains. This was initiated by the Treasury and became known as the “Turkish Catastrophe Insurance Pool (TCIP)”. The pool was based on the experience of schemes established by the California Earthquake Authority and New Zealand Earthquake Commission and became effective in September 2000.

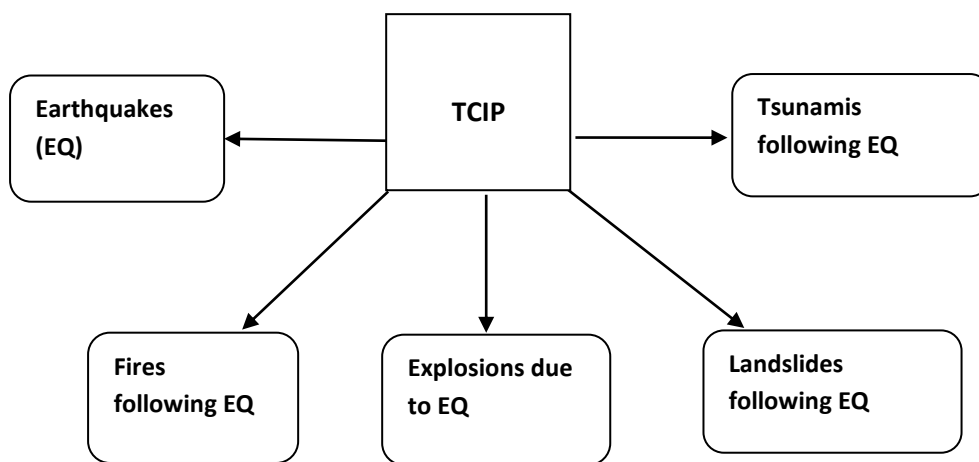
### **The Turkish Catastrophe Insurance Pool (TCIP)**

The TCIP was constructed and organized to serve as a national insurance system. Here we look at the coverage and organizational structure of the scheme. Prior to the Kocaeli earthquake in 1999, fire insurance had been used to cover earthquake losses in Turkey. However, this system, while previously affordable, was insufficient to cover the losses following the event in Kocaeli.

The main objective of the TCIP is to transfer the national risk to a network of world-wide risk sharing pools under the management of international reinsurance companies. It aims to (1) share the burden, (2) pool the risks, (3) spread insurance culture, (4) promote the construction of earthquake resistant structures, (5) provide warranty systems for buildings and (6) help to reduce the economic burden on the government’s budget in times of disaster. In addition, the TCIP plays a significant role in the monitoring and controlling of the necessary building codes required by reinsurers. Indeed, the use and the control of the current National Building Code is one of the key aspects of the existing disaster risk management system in Turkey.

For all these purposes, TCIP has been initiated as a market insurance mechanism that can be voluntarily bought by home owners. The coverage of TCIP (that is demonstrated in

Figure 1) is designed to include the financial losses due to (1) earthquakes, (2) fires following earthquakes, (3) explosions caused by earthquakes, (4) landslides following earthquakes, and (5) tsunamis caused by earthquakes (Başbuğ, 2007; TCIP, 2013). However, it does not cover expenses relating to the removal of rubble, losses arising from business downtime, bankruptcy, stoppage of rent revenue, alternative residence and business premises expenses, and injuries and deaths or any losses occurring after an earthquake that are not stated in the policy (TCIP, 2013).

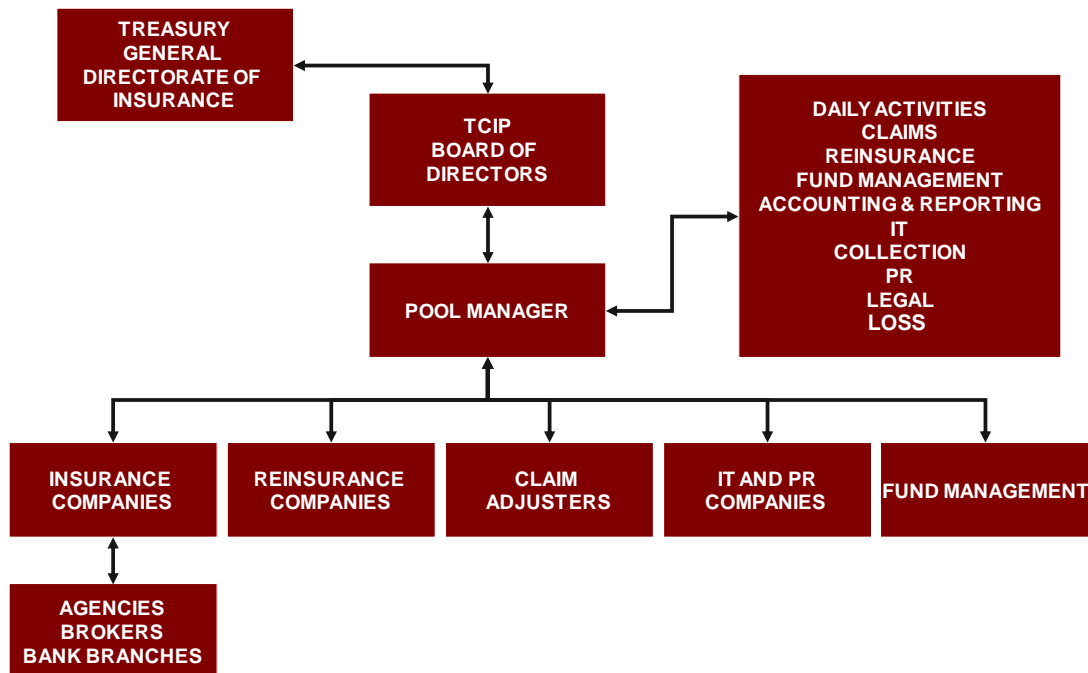


**Figure 1** Coverage of the Turkish Catastrophe Insurance Pool

The organizational structure of the TCIP has a unique characteristic, which is a combination of public and private institutions that is also called a public-private partnership (PPP/3P). More specifically, the administrator of the system is the Turkish Undersecretariat of the Treasury and the operational manager (pool manager) is a private insurance company.

The organization of the TCIP, showing the distribution of responsibilities under the scheme is shown in Figure 2. The board of directors represents the government, experts and the insurance companies. The administrative body is the General Directorate of Insurance within the Prime Ministry Undersecretariat of the Treasury. The operational management of the Pool is contracted out for a five year period. This contract has been recently extended for another five year term until August 2015. The TCIP uses a strong data management and

information technology infrastructure, which enables it to handle claims safely and efficiently. The data arriving in the pool is saved in İstanbul and a ‘disaster recovery centre’ is located in Ankara that provides a non-stop back up service to keep the database safe and functional in case of a disaster in İstanbul (Akın, 2008).



**Figure 2** Organizational Chart of the Turkish Catastrophe Insurance Pool (TCIP, 2013)

### The “Successes” of the Turkish Catastrophe Insurance Pool

This section provides some recent data about the claims of TCIP. It also discusses the latest performance of the system following the major earthquakes and reviews the recent regulatory improvements.

The TCIP insurance scheme is designed to reduce the financial burden to government caused by earthquake disasters. Therefore the TCIP’s risk financing strategies try to optimize the relationship between premium levels, policy coverage, and creditworthiness. The scheme is considered to be one of the best practices among national and international insurance regulators. In 2009, it had the second largest number of policies in the world among the same



insurance systems' category (Deniz and Yüçemen, 2009). Romania and Taiwan have started to construct their own earthquake insurance mechanisms based on the TCIP scheme in Turkey.

The recent claims data of the TCIP as of December 11, 2013 is as follows (TCIP, 2013):

- Total number of policies: 6 million
- Total premium collected: 394 million USD
- Number of earthquakes generating claims: 423
- Number of claims: 20,676
- Total paid claims: 91.3 million USD
- Penetration rate: 35.4 percent
- Total payment capacity: 5 billion USD

The database provides up to date information and the claims can be used to model and forecast future earthquake losses in any part of Turkey. Accordingly, there is an earthquake loss model that was developed for the TCIP at the outset, to guide the initial reinsurance purchasing schemes (Bommer et al., 2002).

According to statistics in 2013, Yalova province has the highest number of compulsory earthquake insurance policy holders in Turkey with 56.8 % coverage, followed by Bolu with 56.3 %, and Düzce with 53.1 %. The scheme is also popular in Tekirdağ, Sakarya, İstanbul and Muğla. The main reason for the high participation rate of these provinces is their recent experience of earthquake related disasters. It is also well-known that an area that is prone to earthquakes is likely to remain vulnerable into the future.

The data also shows a correlation between the value of claims and the magnitudes of earthquakes. For example, 1731 claims worth 1,141 million USD followed the 5.6  $M_w$  magnitude earthquake that occurred in Urla near İzmir in 2003. However, in the same year

for the 6.4  $M_w$  earthquake that occurred in Bingöl, the number of claims was 468, and the total payment by the TCIP was approximately 1,727 million USD.

The TCIP scheme is designed to settle claims within a month of them being made. After the initial expected loss estimation, the TCIP experts reimburse the policy owners partially in advance so that the survivors can handle some of their urgent needs (Başbuğ, 2007). The establishment of the TCIP aimed to reduce the financial inadequacy of the insurance companies with a view to “removing from the state’s shoulders the burden of replacing each damaged building with no premium” (Gülkan, 2002, page 7). Today, in the event of a disaster in Turkey, a variety of sources of assistance are available including: income from premiums and the surplus accumulated by the TCIP over the last thirteen years, a special disaster fund (if designated), budget diversion by the government, and long-term, low-interest credit borrowing from international financial institutions such as the World Bank and the Asian Development Bank. As of January 1, 2013, total earthquake coverage in Turkey amounted to 83,500 USD per housing unit. The deductible amount of the TCIP is 2 percent of the losses (Akın, 2008). Deniz and Yüçemen (2009) reports that this deductible amount is much less than the international amount, which often ranges from 10 to 15 percent. Small to medium earthquakes occur almost every day in many parts of Turkey, which might cause minor damage yet generate a significant number of low value claims. The deductible amount of the TCIP could be increased to cover such claims, which would also decrease the insurance rates applied (Deniz and Yüçemen, 2009).

The TCIP applies fifteen tariffs, which are calculated using the degree of local vulnerability to earthquake hazard and the type of building to be covered. The probabilistic approach to calculate earthquake insurance premium rates is explained in detail by Yüçemen

(2005). Tariff rates are given in Table 2 according to five earthquake hazard zones and three types of buildings, namely, masonry, reinforced concrete, and others.

**Table 2** The tariffs of the TCIP (Percent of insured value) (TCIP, 2013)

Risk zone vs. Building type	Degree 1 risk zone (%)	Degree 2 risk zone (%)	Degree 3 risk zone (%)	Degree 4 risk zone (%)	Degree 5 risk zone (%)
Steel, reinforced concrete	0.220	0.155	0.083	0.055	0.044
Masonry	0.385	0.275	0.143	0.060	0.050
Other	0.550	0.353	0.176	0.078	0.058

The performance of the TCIP following the most recent earthquakes may offer some further insights to the operation of the scheme. A major earthquake of magnitude 7.2 occurred on October 23, 2011 in Van province. Several seismological factors caused Erciş sub-province to experience heavier damage than downtown Van. This earthquake was the most devastating since the 1999 event in terms of the number of casualties and buildings that collapsed. Before the earthquake, the penetration rate of compulsory earthquake insurance (CEI) in Van province was only 9 %. The TCIP sent experts to the region and the first payments started to be made within 10 days following the earthquake. At this stage, the TCIP board was asked to make a critical decision: to continue to sell CEI in the region or not, as the aftershocks were still continuing. The decision was made to go ahead on the condition that a photograph of the building to be insured was taken before the insurance was finalized. Unfortunately, on November 9, 2011, another earthquake of magnitude 5.6 struck downtown Van. The second earthquake caused damage in most of the buildings in Van. At that time, 7318 housing units were holders of CEI policies. It was estimated that almost all of these

buildings were damaged in the second earthquake. As of March 19, 2012, a total of 7,903 claims were reported to the TCIP.

One of the most important objectives of the TCIP is to increase the participation rate so as to provide cover for 12 million household units. To accomplish this, several initiatives have been put into practice. For instance, following the Van earthquakes, the TCIP initiated a hotline, DIAL 125 (ALO DASK 125) to enable claims to be processed. In addition, owning a CEI has become compulsory for real estate transactions. Real estate sales transactions can now only be registered at property deeds offices on proof of CEI insurance. Furthermore, in 2012, all new homeowners must have a valid CEI policy to subscribe for water and electricity services.

Another attempt to increase the participation rate of CEI was announced on the website of the TCIP ([www.dask.gov.tr](http://www.dask.gov.tr)). This took the form of a promotion that offered a 20 percent discount on the regular price of insurance, if eight individual apartment unit owners from the same apartment complex jointly took out a TCIP policy. Moreover, in 2011, the TCIP organized a project competition among 81 cities of Turkey. These cities competed in three categories: (1) the highest rate of participation in TCIP, (2) the highest increase in the number of policies, and (3) the best campaign designed to motivate homeowners to participate. The winner (Bolu province) had a recreation park built with an emphasis on concepts for safe living. The second and third runners up received approximately 6,000 USD and 4,500 USD, respectively.

## **The “Failures” of the Turkish Catastrophe Insurance Pool**

The TCIP system has been mainly based on risk modelling simulation techniques because of the lack of a historical data set (Linnerooth-Bayer, Mechler, and Stigler, 2011). This we believe might lead to several practical problems in the system. For example, while there is a high level of seismic risk in the country, the household participation rate remains comparatively low. The reason for this low participation rate and other issues such as the non-renewal of the policies will be discussed in this section. The policies within the TCIP system are meant to be “compulsory earthquake insurance”. Yet, throughout thirteen years, the following discussions about the participation rate, the cooperation of society and individual perceptions on the TCIP system show that some practices are still problematic and raises the question as to what extent this insurance policy is “compulsory”.

Statistics indicate that less than one-third of the buildings in İstanbul are covered by compulsory earthquake insurance. There are several reasons for this. First, despite some legal restrictions, survivors of earthquakes have so far always received financial support from the government under various guises. Populism and humanitarian concerns have led politicians to promise to help the survivors of natural disasters regardless of their participation in the TCIP system. As an example, the government provided financial support to the survivors, most of whom did not have compulsory earthquake insurance, of the Elazığ Earthquake in 2010. In another case, “...when the government provided disaster relief to uninsured households following the Sultandağı-Afyon Earthquake in 2002, the number of policies decreased to 1.7 million” (the number of policies was 2.4 million on December 31, 2001) (Gurenko et. al., 2006). Thus, the belief that the government will help irrespective of owning an insurance policy reduces the trust of society in policy makers and puts the survivors that actually have insurance in a worse financial situation. Second, the scope of the coverage of the insurance is quite narrow. For example, the owners of commercial and public buildings are not required to

buy the policy (but they can voluntarily purchase earthquake insurance from private insurance companies). Furthermore, residential buildings in rural settlements were not covered by the TCIP until very recently. A micro insurance system has been introduced to provide coverage for rural areas; yet, no data is available to show whether this new application has increased participation in the system. Third, the current mechanisms to oblige earthquake insurance coverage are not sustainable drivers. Households need to show valid policy documentation only when they want to buy or sell a house or to obtain a new account for water and electricity services. Thus, this one-time enforcement does not guarantee that households' will renew their TCIP insurance policies. Fourth, current earthquake insurance premium rates do not include either a probabilistic approach on future earthquakes or a consideration of the seismic vulnerability of the buildings (Deniz and Yüçemen, 2009). Fifth, building stock in Turkey has very different characteristics. Some comply with the regulations of the Building Code, while others do not. Currently, the TCIP does not use the age of the building and its current compatibility with the Building Code in the premium calculations (Deniz and Yüçemen, 2009).

The responsibility of each party in relation to the effective provision of earthquake insurance as a mitigation tool is another important issue. If it is homeowners' responsibility to take precautions against earthquake, then they would be obliged to check if their home is seismically resistant. If it is the owner's responsibility, then they would need to establish how resistant their property is against an earthquake. If it is the government, the building code should be enforced throughout construction. In Turkey, it is the municipalities, who check the compatibility of a construction with the Building Code. Therefore, earthquake mitigation has become an issue of public policy that determines both how we secure earthquake resistant structures and a resilient community.

Finally, until 2012, in Turkey, a decree with the power of law could not stipulate penalties. For this reason, penalties could not be levied against citizens who did not carry TCIP (Gülkan, 2002). Therefore, for much of the life of the scheme, participation could only be increased by raising awareness and the willingness of households to buy insurance. Some proposals have been suggested to increase the penetration rate of the TCIP such as ease of premium payments, providing group insurance with a discount for home owners residing in the same apartment block, using utility bills to enable automatic deduction, and extending earthquake insurance coverage to commercial and public/state-owned buildings. However, the likely effectiveness of such proposals on increasing the levels of household participation in the system remains to be evaluated.

A recent regulatory attempt was made to increase the participation rate by passing Decree Law No. 587 that has subsequently been adopted as Law No. 6305, the ‘Disaster Insurance Law’. This sets out the regulations for compulsory earthquake insurance, the pricing of the premiums, the procedure to cover structural damage due to earthquakes, and the means of reinsurance coverage for the Pool itself. This law will be revised in time to make the current earthquake insurance scheme ‘compulsory’ for various types of disasters in Turkey. In addition, another regulatory change was put in operation in 2013 regarding claims data. The “TCIP claims database” has since been released, which is designed to correspond with the National Address Database. This is expected to enable a robust matching of the actual addresses of households with those recorded in claims and thereby to reduce fraudulent claims.

Clearly, the cooperation of policy makers and the public are crucial for the success of this earthquake insurance system. It is therefore important to understand the possible reasons behind low take up of earthquake risk mitigation. According to Kunreuther (2006a), households are reluctant to buy voluntarily protective measures such as disaster insurance

prior to a hazardous event. People usually buy insurance or use other mitigation measures only after the disaster occurrence, which is called the “natural disaster syndrome”. Kunreuther (2006a) further states the possible reasons of this syndrome as: (1) the individuals’ beliefs that bad events cannot happen to them, (2) budget constraints, and (3) worries about low take up and the overall effectiveness of the scheme. In addition, according to the results of a survey study conducted in İstanbul by Ozdemir and Yilmaz (2011), in which only 35 percent of respondents stated that they had compulsory earthquake insurance coverage at the time, the reasons given by those who had not purchased compulsory insurance (in the most frequently stated order) were found to be that:

1. households do not think they have enough knowledge about the insurance scheme
2. households find the price of the insurance expensive
3. households think insurance is not necessary, their houses are strong enough
4. households think this kind of insurance is not necessary at all
5. households feel like they do not have to have insurance since the obligations imposed are not strong enough
6. households do not trust the insurance system
7. households do not find the insurance mechanism practical since the scheme takes too much time and requires too much paper work. For example, the contract period for the compulsory earthquake insurance is one year. Each year, the homeowner must go through the same process which requires too much paper work according to the responses of the household. Therefore, many households do not renew their policies, especially if they have not experienced an earthquake during the contract year.

These findings can help to shape policy and strategies for motivating households to join the TCIP system. For example, society can be informed about the process and the



usefulness of compulsory earthquake insurance through the media and more practical mechanisms can be established to ease the process such as a system to enable online registration.

Further, the elderly, people with higher education and income levels, owners of relatively more expensive houses/apartment flats, and risk-averse individuals are found to have a greater tendency to buy a CEI policy. This may indicate that the pricing of the insurance can be adjusted according to income levels instead of house size.

## **Discussion and Conclusions**

The Turkish Catastrophe Insurance Pool has been operating as one of the market risk mitigation instruments since September, 2000. The system has a well-established infrastructure and has handled a considerable number of claims and policies, which indicate society's contribution to the system. This can also be used as evidence for encouraging greater participation in the scheme in the future. In addition, increasing the awareness of individuals about earthquakes will help them to appreciate that the government is not the only institution responsible for taking precautions against disaster risks. Individuals themselves can and should do something to reduce the losses caused by earthquakes.

Despite the positive influences of the TCIP system on disaster risk management strategies in Turkey, to what extent this earthquake insurance mechanism is “obligatory” and “effective” is still questionable. The major problem facing the future of the TCIP is the low insurance purchasing rate of households'. There have been some new rules and regulations applied to impose wider participation in the TCIP system (e.g., requiring valid documentation of a TCIP policy to buy/sell a house and to subscribe to water and electricity services). However, these measures do not provide sustainable motives for households to continue buying compulsory insurance and participation in the TCIP system is still considerably low.

Other suggestions to increase the household participation rate can be: making the sum of the insurance price payable on an instalment plan, which can be included in utility bills and increasing the scope of the coverage of the compulsory earthquake insurance by including commercial and public/state buildings in the scheme. In addition to these suggestions, as mentioned previously, there are two main recent regulatory improvements, which aim to increase the participation rate of the households to TCIP system: Law No. 6305, the ‘Disaster Insurance Law’, which sets out the regulations of the compulsory earthquake insurance system in detail and the “TCIP claims database”, to prevent fraudulent claims. Yet, it is too early to see the impact of these changes.

People usually buy insurance or other mitigation instruments only after a disaster occurrence, a fact that Kunreuther (2006a) calls “natural disaster syndrome”. The effects of this syndrome are observed by looking at the TCIP claims data. When an earthquake occurs that causes even very slight damage; people prefer to buy compulsory earthquake insurance. In fact, after the Elazığ Earthquake in March, 2010, the number of applications for compulsory earthquake insurance increased significantly. This is a common pattern for disaster insurance. Reminding of the earthquake risk and its adverse effects is a very difficult objective to achieve, however, providing information and increasing consciousness is feasible. As it is concluded from the survey study undertaken in İstanbul (Özdemir and Yilmaz, 2011), not having enough information about the benefits and application processes of compulsory earthquake insurance is stated most frequently as the main reason for not buying it. This indicates the necessity of providing more information about the benefits and usage of this insurance system to society, maybe through using more media and civil society resources (Jalali, 2002). Individuals should be educated about the importance of mitigating earthquake risk in an earthquake vulnerable country such as Turkey. “Personally delivered communications about inexpensive hazard adjustments that are targeted to specific segments

of the risk area population may be the most effective means of reducing community vulnerability to earthquake hazard” (Lindall and Prater, 2000, page 336). As Kunreuther and Pauly (2004) state, better information provided to the public about the probability of an earthquake occurrence, about the extent of possible damages to their homes, and the mechanism and structure of the insurance policies, may increase consciousness and result in better insurance buying behaviour.

Despite legal restrictions, the Turkish government has previously chosen to assist the victims of natural disasters regardless of their participation in mitigation programs. This policy reduces trust in policy makers as well as bringing inequality between compulsory earthquake owners and non-owners. Therefore, presenting a consistency between the regulations and its application is extremely important to build up cooperative policies between policy makers and the community.

The survey by Özdemir and Yilmaz (2011) shows that, homeowners find the price of the insurance to be quite expensive and they think the insurance scheme is not very practical; it is time consuming and requires too much paperwork. One possible solution is for insurers and banks to offer disaster mitigation loans (Kunreuther, 2002). Additionally, a “comprehensive insurance program” for various types of disasters (instead of separate insurances for each) can be initiated (see Kunreuther, 2006b for a good discussion). Further, the renewal time of the contracts could be extended and paperwork could be reduced. Paperwork and payments could be processed online automatically. The authority as well as responsibility to sign the contract could be given to the managers of apartment buildings, and entire buildings (rather than individual apartment units) could be obliged to have a TCIP policy. This would also eliminate the inherent unfairness in the system between owners of compulsory earthquake insurance (who will finance the rebuilding cost) and non-owners (see Gülkan, 2002, for details). In the same survey, elderly individuals and individuals with

higher education levels and household income are more likely to purchase compulsory insurance. This conclusion supports the results of many previous studies that have reported significant correlations between demographic factors and earthquake risk mitigation (Lindell and Whitney, 2000, page 24). Policy makers and/or insurance companies can use this information to target the households most likely to buy these kinds of mitigation measures. Further, each earthquake insurance policy can be adjusted not only based on the value of the property, but also the socioeconomic status of each homeowner. Finally, in Özdemir and Yılmaz (2011), it is found that more than half of the respondents believe that they cannot do anything to mitigate earthquake risk, instead they think the government is the most responsible agent to do that and mention the media, banking system, and civil society as other responsible agents. In conclusion, the TCIP, with its unique characteristic of combining both public and private forces, can be a better financing mechanism against earthquake losses, if the regulatory authorities present a coherent and unified disaster mitigation law, which is revised to capture all economic agents in society (government, homeowners, insurance companies, media, banks, and civil society) and requires them to cooperate.

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