New Perspectives on Turkey (2024), 1–17
doi:10.1017/npt.2024.31

CAMBRIDGE UNIVERSITY PRESS

ARTICLE

Engineering, law, and the anticipated İstanbul earthquake

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Abstract

There is scientific consensus that an earthquake of a magnitude of at least 7 will soon occur on the North Anatolian Fault, which runs south of İstanbul. This earthquake would render one-fifth of İstanbul's buildings uninhabitable, which means that approximately 200,000 buildings would be expected to suffer moderate or severe damage. As a part of preparedness for the anticipated earthquake, people in İstanbul are invited to have their buildings risk tested. This article, pivoting on cultural anthropology and science and technology studies, investigates how earthquake-proneness of buildings in İstanbul is technically and legally examined and determined. It ethnographically analyzes the risk assessments and demonstrates that the risk is enacted differently through distinctive engineering practices and legal regulations in different networks. When the two different risk assessment processes are examined in İstanbul, a building that is categorized as risky due to its earthquake vulnerability could be regarded as sturdy in the other assessment.

Keywords: risk; earthquakes; İstanbul; science and technology studies

Introduction

On November 11, 2022, a text message suddenly appeared on my cell phone, as I was commuting on a ferry crossing the Bosporus Sea in İstanbul.[1] It stated: "Tomorrow at 6:57 pm, participate in the nationwide duck-cover-hold drill wherever you are." This drill was organized by the Turkish Disaster and Emergency Management Authority (AFAD) to mark the major earthquake that had killed roughly 18,000 people in Northwestern Turkey, in 1999.[2] Even though some citizens did not receive the AFAD notification, the drill information was nevertheless disseminated widely, thanks to the announcements made by mosques, municipalities, television channels, and radio stations, as well as through a video message circulated by President Recep Tayyip

[1] It is necessary to note that this article was written before the Maraş earthquakes, which occurred on February 6, 2023, and killed more than 50,000 people.

[2] On August 17 and November 12, 1999, two devastating earthquakes occurred in Northwestern Turkey with a moment magnitude (M_W) of 7.4 and 7.2, respectively.

Erdoğan, who stated that "it is not possible to prevent an earthquake, but it is in our hands to take measures to prevent loss of life and property" (TRT Haber 2022). However, several earth scientists indicated that even though drills are helping citizens to protect themselves, they are absolutely not tantamount to a real answer to earthquake preparedness, and, as such, drastic action should be introduced (Sözcü Gazetesi 2022). Following the 1999 disaster,[3] numerous scientific studies were conducted in Turkey, which all reached the consensus that another earthquake of a moment magnitude (M_W) of at least 7 would occur soon on the North Anatolian Fault, which runs south of İstanbul, causing at least 30,000 deaths and the collapse of over 50,000 buildings. Research undertaken by the İstanbul Metropolitan Municipality in 2021 demonstrated that a M_W 7.5 earthquake scenario would render one-fifth of İstanbul's buildings uninhabitable, which means that approximately 200,000 buildings would be expected to suffer moderate or severe damage (2021). However, scientifically speaking, there is no way to ascertain the specific location and time of the anticipated earthquake. Moreover, there is an understanding that the risk of the anticipated earthquake is so high and so much is at stake that no state regulation will ever be adequate. This perspective underlining the difficulty of state intervention against such a prevalent and ambiguous risk has become a justifying discourse as to how the state is absolved of its responsibilities and has left its citizens to solve matters on their own. Ultimately, in terms of being prepared for the anticipated earthquake, citizens are constantly defined as self-responsible, self-fulfilling, and entrepreneurial subjects (Lemke 2001; Rose 1996; 1999) who are solely responsible for knowing how great a risk an earthquake poses and assume the responsibility of managing their, as well as other people's, lives. If one of the things that Turkish citizens are requested to do is to participate in earthquake drills, the other is to have their buildings risk tested for such an expected disaster.

Pivoting on cultural anthropology and science and technology studies (STS), and relying on my fieldwork in İstanbul, this article investigates how earthquake-prone buildings in İstanbul are technically and legally examined and determined. I ethnographically analyze the risk analysis tests and demonstrate that the risk is enacted differently through distinctive engineering practices and legal regulations in different networks. When the two different risk assessment processes are examined in İstanbul, a building that is categorized as risky due to its earthquake vulnerability could be considered sturdy in the other assessment. This paradoxical situation reveals that numerous buildings in İstanbul are facing the prospect of demolition: while they are deemed to pose a risk, they themselves turn out to be the entities at risk. In other words, they become the "risk objects" and the "objects at risk" (Boholm and Corvellec 2011; Hilgartner 1992) at the same time.

The earthquake preparedness of the city is legally performed on a twofold basis through single-building renewal implementations and area-based regeneration

[3] Also, just over a week following the nationwide drill, an earthquake with an M_W of 5.9 occurred in Düzce and was felt in Ankara, Istanbul, and İzmir. Consequently, the Union of Chambers of Turkish Engineers and Architects issued a statement that more than 90 percent of Turkey's population – of 85 million – lived in earthquake-prone areas, but "no serious progress" had been made since 1999. They emphasized that the most urgent priority is to address and revitalize the country's aging and poorly constructed building stock.

https://doi.org/10.1017/npt.2024.31 Published online by Cambridge University Press

projects. This paper analyzes only the single-building renewal with an analysis of two different processes of conducting building risk assessments and the consequences of these processes.[4] The research is derived from fieldwork that lasted for about six months in 2021, in the Kadıköy district of İstanbul, where I conducted in-depth interviews with forty-five people: property owners, tenants, earthquake and civil engineers, members of risk assessment companies, municipal officials, and lawyers. Moreover, I paid visits to the demolition, retrofitting, and construction sites of the single risky buildings and talked to the contractors and construction workers on-site.

I selected Kadıköy as my field site because it serves as a multifaceted and contentious case study in the context of urban transformation. In İstanbul, urban regeneration efforts have not been primarily directed towards the neighborhoods with the most pressing needs in terms of earthquake preparedness. Instead, they have predominantly occurred in areas where there are high land and property values, which are coupled with the prospect of substantial future sales values following urban renewal (Gibson & Gökşin 2016; Güney 2024; Güzey 2016; Özkan Eren & Özçevik 2015; Tarakçı and Şence Türk 2020). Kadıköy is also an example of a neighborhood which falls within the upper-middle-class category and boasts a substantial real estate value, with the average value per square meter being nearly two and a half times greater than the İstanbul-wide average in 2023 (Zingat 2023; also see Bayurgil 2022). Despite being designated as an earthquake-prone district, Kadıköy does not necessarily exhibit the highest level of seismic risk that would warrant its extensive and ongoing urban transformation. In brief, the juxtaposition of substantial construction efforts within the neighborhood and its relatively lower sense of urgency concerning earthquake preparedness renders Kadıköy an enticing subject for exploration.

Numerous scholarly investigations have been dedicated to examining the intricate relationship between risk and the anticipated İstanbul earthquake. Within this body of research, the notion of disaster risk in İstanbul has been examined through diverse conceptual lenses. Several studies scrutinized this relationship through the concept of "riskscape" (Ay and Demires Ozkul 2021), "emergencyscape" (Batur 2022), "disaster neoliberalism" (Neumann 2018), "disaster capitalism" (Güney 2024), and "assemblages" (Angell 2014; Gourain 2022a). Furthermore, certain other studies have honed in on comprehending earthquake risk by tapping into various professional groups and analyzing the earthquake risk through expert knowledge (Green 2008; Gourain 2022b; Ickert and Stewart 2016; Kayaalp and Arslan 2021). This rich tapestry of prior research forms the backdrop against which this article unfolds. The unique focus of this article, however, lies in its exploration of unexplored territory within the İstanbul context through an in-depth ethnographic investigation of risky buildings.

The next section will delve into various approaches to the concept of risk and elucidate the ways in which this article diverges from these interpretations. The subsequent two sections will individually investigate the Earthquake Code and Law

[4] Actually, there are three methods of conducting earthquake risk analysis of buildings in İstanbul right now. The third one, which is done by the İstanbul Municipality, started in July 2019. It requires a quick scan of the building and has no legal sanctions. In this paper, I will not be discussing this method since it is relatively new and was not in demand until the devastating Maraş earthquakes. While the municipality team was able to test about 30,000 houses in 2.5 years (more than 70 percent of the houses did not allow them to make a quick scan), the number of citizens who applied to the Municipality for the test reached 100,000 in a few days after the Maraş earthquakes.

No. 6306 based on the evidence I have collected during my fieldwork. I will conclude the article by comparing these two distinct risk assessment processes against each other.

Knowing the risk

Risk has thoroughly been discussed in the social sciences, especially after Beck (1992) coined the term "risk society." However, numerous studies have taken risks for granted while paying no attention to the study of how they emerge. The analyses presented in STS concentrate on the issues of how risks are incurred and have opened the "black box" of risk, and discuss how risks are incurred in flood control (Bijker 2007), in fires (November 2004), in health (Robins 2002), in the insurance industry (Van Hoyweghen 2007), and regarding biothreats (Samimian-Darash 2016).

Basically, there are two different approaches to the production of risk. According to the realist approach, experts can accurately and objectively determine and calculate risk (Adams 1995; Robins 2002). In this approach, the risk is natural and real and is independent of the procedures by which it is assessed. The relativist approach, on the other hand, argues that risk does not exist independently from its assessment and is socially generated. In this account, the risk does not stem from a rational decision about reality, but rather emerges according to the values that people share (Dake 1992; Douglas and Wildavsky 1983). As such, while for the realists, risk is singular, for the relativists, it is plural. However, in STS especially, Actor–Network scholars oppose this dualism that necessitates either a focus solely on social practices or on a rigidly objective viewpoint on the grounds of being deterministic and reductionist, and, instead, they aim to trace how material–semiotic networks come together and get stabilized by relating heterogeneous elements in networks (Callon 1986; Latour 1993; 2005; Law 2004). This perspective emphasizes that objects, technologies, and other non-human entities are not passive elements but active participants in shaping social realities. Material entities carry meaning and influence social processes, while semiotic elements are materialized and enacted through various practices and interactions within networks. In the backdrop of these studies, several scholars studying risk with the STS perspective offer a broader understanding of risks, which are "no longer in the hands of experts or (national) authorities alone" (Beck and Kropp 2010) but enacted within a network or assemblage (Donovan 2017; Neisser 2014; November 2008). This perspective has assisted me in shaping my arguments in different ways. Firstly, it underscores that earthquake risk attached to a building is shaped by a multitude of factors, in my case, encompassing engineering practices, technical calculations, laboratory experiments, legal regulations, and the evolving material states of structures. Consequently, risk is not a static, objective entity awaiting discovery, but rather is produced in a continuous, uncertain, and dynamic process in an assemblage of different sets of material relations. As Healy (2004, 284–285) argues, "risk is neither a property of the human or non-human world but arises from the interactions between them and is performed by the complex ensembles they constitute."

Nevertheless, as I will demonstrate in the subsequent sections, the risk is predetermined for the majority of buildings in İstanbul before the assessments are conducted. Although tests are conducted on hundreds of buildings with different

https://doi.org/10.1017/npt.2024.31 Published online by Cambridge University Press

material conditions, ages, number of floors, and locations, the risk assessment results consistently indicate demolition. However, if these same buildings were tested within a different network, some might prove to be earthquake-resistant, while others might be evaluated as structures with significant damage but with the potential for human survival. The intricate nature of risk assessment becomes strikingly evident when considering a scenario in which a building is deemed risky due to its lack of earthquake resilience. Paradoxically, this very building, despite being labeled as a potential hazard in one network, may itself be at risk of demolition in the other one. This disparity has nothing to do with the mistakes made in the incorrect technical calculations, wrong laboratory results or incompetent engineers, but shows us very well how these processes for the same building, under the scope of different networks, can produce different risk results.[5] The risk assessment produces multiple risks that might be enacted to the same building in different networks: the same building might be both a building-as-risk and a building-at-risk at the same time.[6] These two notions/statuses have different sorts of purposes, have encouraged different sorts of practices, and have also called for quite different responses. Explicitly, the realities of these buildings have been enacted as separate processes in different networks and, to that end, certain ontological enactments have been prioritized while certain others are neglected, thereby incurring diverse political consequences (Howitt and Suchet-Pearson 2006; Mol 1999).

The earthquakes in 1999 have become a turning point in disaster preparedness and risk mitigation efforts in İstanbul and have accelerated urban regeneration and transformation projects, especially in the most earthquake-prone zones. However, these projects, which have been carried out under the pretext of earthquake preparedness, have been highly criticized for the inequalities and injustices that they have incurred for local residents (Dedekorkut-Howes et al. 2020; Gibson and Gökşin 2016; Güney 2019; 2020; 2024). Along with their marginalization, the residents of İstanbul have also been abandoned when it comes to future earthquake preparedness, i.e. they have been asked to take full responsibility for their own safety and to follow the legal steps in order to ensure that their buildings are sufficiently resilient for the expected earthquake. As one bureaucrat who works in the urban transformation department of a high-risk neighborhood declared to me in an interview, the government's goal is to "find one responsible citizen in each building" who would carry out a risk assessment of the building he/she lives in.

In Turkey, there are two different and major legal regulations that determine whether or not a building is resilient to an earthquake. Yet, there is a significant difference between the two regulations concerning the legal enforcement of such regulations on existing buildings. The first regulation is the Turkey Building

[5] While the case of buildings may seem specific, a similar dynamic is observed in other contexts. For instance, in the case of urban trees, different networks – such as environmental agencies, urban planners, and local councils – can produce differing outcomes when assessing the risks defined for the same tree in Australia (Jones et al. 2014).

[6] A "building-as-risk" refers to a structure that, due to its lack of earthquake resilience, endangers its surroundings and inhabitants. Conversely, a "building-at-risk" describes a structure that may not necessarily have poor earthquake resilience but is at risk of demolition due to the profit-driven motives of construction companies. These companies may seek to demolish and rebuild such buildings, capitalizing on concerns about potential earthquake safety to pursue their own economic interests.

Earthquake Code[7] which was first put into operation in 2007 and then expanded in 2018. It is voluntarily used by citizens to understand the possible earthquake risk of the building in which they are living, although the result of the risk test has no legal enforcement. Under the Earthquake Code, the risk assessment of the building is typically performed with the consent of the majority of the residents, and the fee that is paid to the risk assessment company is divided amongst themselves. On the other hand, Law No. 6306 on the Transformation of Areas under Disaster Risk, known popularly as "the Disaster Law" enacted in 2012, is legally enforceable.[8] According to Law No. 6306, to determine whether a structure is risky, there is no requirement to obtain the majority vote. Under this law, it is possible for a single property owner to initiate the risk assessment process for the building (İlgezdi 2021, 123). If the test result is negative, then Law No. 6306 entails legal enforcement of the demolition of the building, from which the residents must move out.[9] As reiterated several times throughout my fieldwork, the two legal frameworks are often confused with one another. Nonetheless, it is possible to conduct a risk assessment test with both regulations. In the following section, I will first explain the application of the Earthquake Code through several case studies in my fieldwork.

Engineering the risk

In front of me, there is a carved building, and next to it is a mound of stone, earth, iron, and rubble dug out of the building. There is now nothing left other than the "four walls" of the four-story building that had once hosted 100 square meter apartments; everything else has been demolished. The entire building was emptied for retrofitting and the families were displaced. A radial foundation is now being laid under the building. Mr Zeynel, a self-made constructor who has been in the business for years and who had established his own company, currently works with his nephew, who recently became a civil engineer. In the past, the family used to build gated communities, but now they only engage in "boutique" business since the construction industry has deteriorated.[10] The term "boutique" here mostly refers to

[7] Türkiye Bina Deprem Yönetmeliği.

[8] 6306 Afet Riski Altındaki Alanların Dönüştürülmesi Hakkında Kanun.

[9] According to Law No. 6306, the proprietors of the building are given a period of no less than sixty days to demolish the risky building. If the building is not demolished by the proprietors of the building within this period, an additional period of no less than thirty days is given. In short, both the demolition and evacuation process of the risky building take place within ninety days. If the building has not been demolished within this ninety-day time period, the municipality initiates a process to cut the building's services, such as electricity, water, and natural gas. Rental assistance is given to property owners for up to eighteen months, with up to the first five months of the rental assistance being paid in advance, taking into account the moving costs. In addition, the tenants of the buildings that have been evacuated by agreement are provided with assistance of up to twice their monthly rent. In accordance with the law, once a building has been declared risky and undergoes the processes of demolition and reconstruction, a two-thirds majority of the property owners must be presented so as to reach the decision of which developer to employ. If this ratio cannot be met, immediate expropriation is possible, as well as administration taking into consideration the shares related to the payment of the current value. For the opinion that the owners of a building, who can make decisions via their two-thirds share of the land, can disproportionately restrict the property rights for the remaining shareholders, see Kiraz (2019, 19).

[10] Although I lack precise statistical data, my firsthand observations from fieldwork indicate that the small and medium-sized construction businesses in Turkey have encountered fluctuations and

https://doi.org/10.1017/npt.2024.31 Published online by Cambridge University Press

risk detection and the retrofitting of buildings. All columns of the building, including the upper floors, are being strengthened. Since the building does not have a "development right," it is not possible to reconstruct it in the event of its demolition. That is why retrofitting is the only alternative for the owners of the building.

The retrofitting of buildings is being conducted according to the criteria defined in Article 15 of the Earthquake Code of 2018. As some background, the first earthquake code for buildings was published in 1940, following the 1939 Erzincan earthquake in which more than 30,000 people died. Then, this code was renewed in 1968, 1975, 1998, and once more in 2007, respectively. In the 2007 code, unlike the old regulations which had only determined the regulations for to-be-constructed buildings, a new section was added for the first time, which covered the subject of the "evaluation and retrofitting of existing buildings under the influence of earthquakes."[11] This meant that the Earthquake Code would not only dictate the design and construction of earthquake-resistant buildings, but could also be used for assessing the risk of existing buildings. The 2018 Code[12] further expanded the regulations: while the 2007 regulation consisted of seven chapters and was 166 pages in length, the 2018 regulation consists of seventeen chapters and is 400 pages in length and entails a much more elaborate analysis with the introduction of a new seismic hazard map, earthquake ground motion levels, and building performance levels (Sucuoğlu 2018).

As mentioned before, even if a building tests as risky, the Earthquake Code has no grounds for the legal enforcement of demolition. This feature – having no legal enforcement – is one of the reasons why certain property owners are applying to companies to run the Earthquake Code risk test. They simply want to know whether or not their building is earthquake-proof. If not, the property owners would like to have the option to retrofit instead of demolition, as legally enforced by Law No.

difficulties since the global financial crisis of 2008. The sector, which was once predominantly composed of small-scale and locally based contractors, has gradually shifted. Large capital groups, often associated with real estate investment trusts, have begun to play a more prominent role in the construction industry (Yeşilbağ 2016, 612). Meanwhile, small-scale construction firms, akin to Mr Zeynel's, have identified opportunities in retrofitting apartment buildings for earthquake resilience, adapting to changing market dynamics.

[11] The 2007 Chapter 7 "Special Rules for Evaluation of Existing Building Systems and Retrofit Design" became Chapter 15 in 2018. This study specifically deals with the risk assessment of existing buildings.

[12] According to Gülkan (2018), Article 7 of the 2007 Code, titled Evaluation and Retrofitting of Existing Buildings, was a condition introduced by the funds received from the World Bank to finance the İstanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP): "The bank insisted that the funds be used in the strengthening of public buildings, not according to arbitrary methods –as was the case in our country until then–, but based on principles they were sure of their accuracy." ISMEP is a risk reduction project established within the İstanbul Governorship, and which aims to protect public buildings and historical monuments, including schools and hospitals. The budget of ISMEP, which was first founded in 2006 with 310 million Euros received from the World Bank, has reached 2.328 billion Euros in 2019. According to an enlightening study conducted by Ay and Demires Ozkul (2021), a World Bank report published in 2018 has highlighted that the phase of retrofitting private houses within ISMEP's original scope of work was ultimately removed from the project due to the state's unwillingness to financially support private assets, and the absence of a legal framework concerning urban transformation during the period when ISMEP was launched. This is yet another example of the state avoiding taking responsibility for the earthquake resistance of private houses and leaving citizens to fend for themselves against the market.

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6306.[13] Yet, still "[o]nly 10 percent of the risky buildings are strengthened," explains one engineer I interviewed.[14] There are several reasons for this. First, retrofitting is an expensive method; when the cost of retrofitting the building is roughly equivalent to 40 percent of the demolition and reconstruction costs of the same building, then demolition is preferred. Second, it is difficult to meet retrofitting criteria. For example, if the building is very old, it does not make sense to strengthen it. Lastly, retrofitting requires technical expertise. As a young construction engineer who had recently graduated and was working at a risk analysis company explained to me:

> It is difficult to strengthen buildings. You need to collect samples from each floor of the building to analyze the conditions of the rebar and beams. If we see that the concrete grade of the building is C-5,[15] it will be like asking an 85-year-old man to carry weights on his shoulders. But if the building has C-15 concrete grade, then it can be strengthened. I don't even mention it as an option for cement grades below C-10. It's very difficult to design retrofitting projects for them; under its shell, the building is very risky … I have asked for help from my professors to run this risk analysis, as the municipality also requires university approval.

This process requires competent engineers and engineering (Aydınoğlu 2021, 218). The recommended engineering calculations within the Earthquake Code demand that cement samples be collected from each floor of the building and evaluated not only to analyze if the building is risky but also to test its seismic performance levels in the event of an earthquake. This fine-tuned engineering is significant for the assessment since some buildings are able to provide safety of life despite the damage they may endure. The earthquake engineer I interviewed explained this situation as follows:

> Once the risk is evaluated according to the Earthquake Code you will be able to see where you stand within the range of [what classifies as] "bad." Presumably, the building I live in will also turn out that way [he shows a range using his hands, and points at a medium range]. These buildings will not collapse in the event of an earthquake. The buildings that are at a much lower end of this scale will collapse. If your building's performance is around the medium range, then you won't act with the economy in this state, maybe you will wait.[16]

[13] Generally speaking, retrofitting mostly pertained to historical buildings, public buildings, and buildings without development rights. Under the auspices of Law No. 6306, citizens have obtained certain rights to receive loans, alongside relocation and rent allowances. They cannot enjoy these rights if they move forward with the retrofitting option.

[14] After the Maraş earthquakes of February 6, 2023, the preparedness for the anticipated İstanbul earthquake has gained momentum. Many people started to have their houses tested for earthquake resistance, and these risk companies soon became unable to meet these demands due to the intensity.

[15] "Concrete quality classes are defined according to the characteristic compressive strength of concrete. For example, the characteristic compressive strength of concrete in concrete class C30 is 30 MPa" (Aydınoğlu 2021, 195). While concrete graded below C10, known as wet lean mix, is often used for laying curbs, the 2018 Earthquake Code stipulates the use of at least C25 concrete in buildings.

[16] In accordance with the Earthquake Code 2018 guidelines for evaluating the performance of both existing and new buildings, there are typically four fundamental performance levels outlined. These are

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All the earthquake engineers I spoke with described a very comprehensive, time-consuming, and expensive process for risk assessment introduced by the 2018 Earthquake Code. It has been portrayed as a model that is not possible to be used for the entire city since it is neither technically practical nor economical. Thus, another model to assess the earthquake risk of buildings was introduced in 2012, in the aftermath of the Van earthquake. An engineer described the historical process of the new earthquake law as such:

> Examining the buildings with this [Earthquake Code] method was a burden in itself. The ministry wanted to develop a faster, cheaper method. They formed a commission with professors from different universities. The aim here was to *mathematically prove what is already known*, without having to take a sample from every floor, in buildings that you can see at a glance that they are at risk. As a result, the Risky Building Detection Principles [which is the Annex to the Implementation Regulation of Law No. 6306] came out. It's faster, it's cheaper . . . The point of it is to prove that a building is in bad shape.[17]

The objective was to mathematically confirm the existing knowledge regarding buildings at evident risk, enabling swift demolition. While the apparent aim was to enhance safety in disaster-prone cities efficiently and economically, the implementation of this law concealed deeper, and more urgent motivations. The construction sector in Turkey experienced significant growth as part of the broader strategy to navigate through the aftermath of the 2008 global financial crisis. In response to economic challenges, there was a concerted effort to redefine capital accumulation strategies, with a notable shift towards privatization initiatives. Particularly in the 2000s, Turkey witnessed a surge in privatizations across various sectors, which had a profound impact on urban development policies. This policy was underpinned by the enactment of Law No. 6306, which sought to establish a "fast and organized system of urban regeneration" (Güzey 2016). The law, targeting areas susceptible to disaster risks, was perceived to expedite legal and bureaucratic procedures, bypass democratic planning processes, and resolve property ownership and planning issues (Özkan-Eren and Özçevik 2015, 227). The enactment of Law No. 6306 was strategically crafted to bolster and elevate the construction sector and has represented a deliberate move towards market-driven urban development policies, positioning the construction industry as a key driver of economic growth and urban transformation in Turkey (Güney 2024; Kuyucu and Ünsal 2010).

Legislating the risk

According to Law No. 6306, a risky building is defined as "a building or structures determined by scientific and technical data to fall inside or outside the risky area, to serve no economic purpose, or to be at risk of collapse or major damage."[18]

categorized as continuous use (CU), performance level limited damage (LD), controlled damage (CD), and collapse prevention (DAM) performance levels.

[17] Emphasis added.

[18] A new phase within urban transformation started with the enactment of Law No. 6306 in 2012. Specifically, there are three fields of implementation accounted for within the scope of this law: "risky

https://doi.org/10.1017/npt.2024.31 Published online by Cambridge University Press

The original objectives of Law No. 6306, which were initially geared towards promoting earthquake-resistant buildings, have given rise to entrepreneurial endeavors among construction companies exploiting the legal loopholes. In essence, building resilience has been overshadowed, bringing about an unregulated real estate market driven by economic incentives.

The two basic features of Law No. 6306 have paved the way for the formation of a legal, albeit irregular construction market. The first feature is the *a priori* knowledge that all buildings dated prior to 1999 will be demolished, while the second one is that property owners of the buildings are primarily responsible for determining whether or not their buildings are risky.[19]

All the people I interviewed – be they tenants, property owners, municipal officials, civil engineers, earthquake engineers, contractors, and those working in earthquake risk analysis companies – stated that the building risk assessment analysis conducted within the framework of Law No. 6306 has revealed that all buildings built before 1999 typically turn out to be risky and entail the issuance of a demolition order. An earthquake engineer explained this situation as follows:

> I must have conducted 150–200 building risk analyses. So far, not a single risk-free building was identified. I did not come across any risk-free reinforced concrete buildings, because the concrete classes of [these buildings] are C-7, 8, 11 max. Today C-8 has no more than paving stone strength.

There is a significant difference between the quality of concrete used in construction today and that used in the past, and Law No. 6306 applies today's criteria to buildings constructed in the past:

> The building stock is very old. More than 60 percent of the building stock in Turkey is over 20 years old. The concrete quality of our buildings before 2000 is very bad. There was no ready-mixed concrete. The value, which should normally be at least 20, stays around 9–10. This is just one criterion. For example, the amount of rebar used is also important. The distance between the reinforcements should not be more than 10 cm, like 20 cm. The reinforcements should be ribbed but they are not. … If you get this risk report, and the building is old, 99 percent of the time, almost all of them, will turn out to be

areas," "reserve building areas" and "risky structures." "The Principles Regarding Detection of Risky Structures," Annex 2 to the Implementation Regulation of the Law, aims to reduce the destructive effects of earthquakes via the identification and demolition of buildings that would pose a risk during an earthquake and the construction of new buildings in their place.

[19] Risk assessment tests of buildings can be conducted by the Ministry of Environment and Urbanization, by their administrative bodies, or by the proprietors of the buildings through institutions and organizations licensed by the Ministry. More than half of the authorized institutions and establishments are composed of private institutions and companies (55 percent), followed by the Municipality (29 percent), the Provincial Special Provincial Administration of Environment and Urbanization Directorates (12 percent), and universities (5 percent). As of the effective date of the law, a total of 1,317 institutions and organizations in Turkey have been licensed by the Ministry for the detection of risky structures (Çelikbilek and Öztürk 2017, 194).

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> risky. It's almost impossible that these calculations will prove any building fit, because the calculations have changed a lot.[20]

Hence, the risk assessment conducted within the framework of Law No. 6306 will always yield negative results, no matter the condition of the building, if it had been constructed before 1999, and this information has led construction companies to invest in those apartments before they even carry out the risk assessment test.

According to Law No. 6306, it is sufficient to have one of the property owners in a building apply for a building risk assessment.[21] While the law previously required a majority decision for the application to run a building risk assessment, the current law allows a single property owner to initiate this procedure. As an earthquake engineer put it: "even if there are 100 people living in the building, if the building is found to be risky, a demolition order is issued despite all objections."

These two pieces of information – that it is sufficient for only one property owner in the building to file a legal application for the risk assessment to be carried out, and that all buildings built before 1999 which are tested for their earthquake resistance will ultimately yield negative results – have led to the birth of a new market in the construction sector. Numerous construction companies have started buying apartments with the intention of demolishing and then reconstructing them, as they are confident that the risk analysis results will all be negative. The companies file legal applications as one of the owners of the building and then force all the residents to deal with the demolition, with that company then becoming responsible for the reconstruction. Ms Nurçin who lives in a charming 1960s building in İstanbul, clarified this:

> There is X company which has already appropriated all Kadıköy. They bought three apartments in our building. … I was not aware of when or how they bought them. It was probably done covertly … Then, it [the construction company] got a *çürük* [decayed, rotten] report for the building.

Mr Cevdet, who runs a café and lives in Kadıköy, also had a similar experience:

> One of the property owners sold one of their apartments to a construction company. … They wanted the building to be demolished. But the property owners did not give consent to that since they thought the building was in

[20] Moreover, construction inspections have only started to be carried out by "building inspection organizations," which were established in accordance with Law No. 4708, enacted in 2001. However, this time, construction companies were able to select their own building inspection companies, with financial relations being established between the inspectors and the inspected; thus, corruption began. In 2019, it was enforced that the selection of inspection firms had to be conducted through a lottery system, which resulted in a healthier, less corrupt system overall.

[21] "In the process of evaluating a building's condition, there is no requirement to obtain a majority consensus among property owners. Under this law, it is feasible for a single property owner to initiate the assessment for a potentially risky structure" (İlgezdi 2021, 123). It is important to note here that in Turkey individuals own an apartment within a building, while also jointly owning the land on which the building is constructed. Under this ownership, each apartment has its own independent title deed, and the owner has full rights over their individual unit.

> good shape. However, the person finally sold the building to the construction company and received an additional apartment [in the building to be constructed] in return. The construction company requested a risk assessment, and they took core samples from the building.

As a result of the legal regulations following Law No. 6306 entering into force, a new construction market has been created whereby citizens and construction companies are in confrontation. Once the construction industry became aware of the fact that all buildings erected pre-1999 would turn out to be *çürük* if assessed for their earthquake resilience, building risk analyses are no longer the starting point for the process but rather a technical report that justifies the demolition. In districts like Kadıköy, where the income gained from real estate is high, it is not surprising to see that construction companies are buying apartments in buildings that pre-date 1999 and applying for a risk analysis to be conducted on the building. Rather than selecting the riskiest buildings, the construction companies' criteria now focus on the architectural features of the buildings to maximize their profit.[22] They approach the property owners of the building on which they had set their eyes and reach an agreement with them. Then, they buy apartments in these buildings, which is followed by the submission of their official applications. In the end, the earthquake preparedness through the risk assessment enshrined under Law No. 6306, which was originally based upon the motivation of identifying buildings-as-risk, in reality has created buildings-at-risk, which are not necessarily in bad shape.

Same building, multiple risks

It is pertinent to note once more that Law No. 6306 is a legal framework that deals with the legal and administrative aspects of urban transformation, while the Earthquake Code, on the other hand, is a technical document that provides engineering guidelines and requirements for earthquake-resistant construction, including specifications for various building types, materials, and seismic zones. This distinction between the two regulations becomes apparent, especially when the risk assessment is conducted using two different methods. An engineer explained to me that the starting point of Law No. 6306 is to "prove that the building is *çürük*. The risk analysis is used as a technical justification for demolition. The real purpose is not to determine the condition of the building because it has already been decided to be renewed." Consequently, despite Law No. 6306 encompassing similar technical requirements, such as concrete and steel bar assessment through stripping tests and concrete sample testing in laboratories, its overarching purpose is demolition. This sets it apart from the Earthquake Code, which employs these same techniques in a more nuanced manner, as its primary objective is to evaluate building performance during seismic events. Assessing earthquake-related structural damage and

[22] The primary objective of construction companies is to maximize profit, which leads them to focus on neighborhoods with high land and property values. In these areas, they select buildings that offer opportunities for adding extra floors or larger apartment sizes. This approach enables them to increase the total sellable space and, hence, their profit margins. However, this strategy often overlooks the importance of prioritizing the most vulnerable buildings that are at higher risk, favoring more profitable ventures instead.

https://doi.org/10.1017/npt.2024.31 Published online by Cambridge University Press

determining structural risks for existing buildings, as outlined in the Earthquake Code, is an essential engineering service. Providing this service demands the expertise of a structural or earthquake engineer, which can be as intensive as designing a new building, and, in certain cases, even more labor intensive and knowledge intensive than designing a new structure (Aydınoğlu 2021).

This means that the same building can generate different results when two different risk assessments – those proposed by Law No. 6306 and by the Earthquake Code – are applied, as explained to me by a civil engineer:

> In fact, it's probable that most of the buildings categorized as unsafe [under Law No. 6306] will prove safe for life. They will survive damage, and presumably, they will not kill [people]. Unfortunately, it is difficult to determine which ones will really kill.

As mentioned before, there are different levels of building performance outlined in the Earthquake Code. The scale, which starts from "definitely *çürük*," which means a definite collapse of the building to various other levels of performance, requires a complicated engineering calculation. However, with Law No. 6306, it is impossible to see the in-between levels of performance because the goal is not retrofitting and strengthening of the buildings. Here, there lies only one question: whether the building is in poor condition and requires to be demolished, or not. As a young engineer working in a private construction company and running risk assessment tests stated:

> We set various performance levels in the 2007 regulation. This building is very poor, poor, fair quality . . . But according to Law No. 6306, they need to say whether this building is good or bad, whether it is to be demolished or not.

The risk analysis conducted within the framework of Law No. 6306 introduces a more simplified method to technically "justify" the demolition decisions taken in the process of urban transformation. Under Law No. 6306, when the risk is calculated using a more practical and simple calculation in order to fall within the bounds of a mathematically safe place and to ensure the work, the building turns out to be *çürük*. On the other hand, a more realistic approach and more sophisticated engineering knowledge can determine this "safety of life" status for the same building under the Earthquake Code. Yet, if the whole city is taken into account, it becomes impossible to implement the Earthquake Code which provides much more detailed evaluation results for all buildings.

Consequently, the same structure can simultaneously fall under both categories: a building-as-risk and a building-at-risk. In other words, while portrayed as two separate conditions, the risk object and the object at risk merge. This paradoxical situation underscores the prevalence of numerous buildings in İstanbul teetering on the brink of demolition due to their classification as potential risks, despite the fact that they themselves are vulnerable to being razed rather than posing an imminent threat to public safety. This complexity highlights the intricacies and challenges inherent in urban transformation efforts, wherein the interplay of legal regulations, and engineering calculations, can result in often contradictory outcomes for buildings.

https://doi.org/10.1017/npt.2024.31 Published online by Cambridge University Press

Conclusion

In the studies of anthropology of disaster and risk, Lakoff and Collier (2008), Masco (2008), and Samimian-Darash (2016) have delved into the transformative power of anticipated disasters on our current reality. These studies highlight how the mere expectation of impending disasters can reshape the present moment in various ways. Disasters on the horizon not only influence our current circumstances, but also set the stage for speculative processes driven by risk assessment. In doing so, they create a fertile ground for new initiatives, opportunities, and emerging markets. This dynamic interplay between anticipation, risk, and entrepreneurship is also a central theme of this article. As I have sought to demonstrate, the case of compiling a risk analysis of buildings in İstanbul is steeped in great disorder (Roitman 2004). This market has been predicated on the knowledge shared by construction companies and certain individuals for whom the results of the risk analysis of buildings are known prior to conducting analysis.

According to the legal regulations, if the risk of buildings is not actually defined, calculated, and scientifically demonstrated by experts, these very buildings cannot be seen as risky, and therefore the demolition process cannot be initiated. Nevertheless, the ethnographic examples I have provided testify otherwise: when we open the black box of the network of Law No. 6306, it becomes obvious that basic knowledge regarding a single building precedes all technical calculations, subsequently paving the way for entrepreneurial endeavors. As opposed to the commonsensical belief that engineering knowledge is the source of legal action, it has become the product of this process – in other words, the legal action regarding the buildings had already taken place even before the technical risk assessment started. Risk assessment follows the action that it is intended to inform, and this knowledge creates new opportunities and initiatives for some, while laying the basis for deep grievances for others. Through the conversion of the "known unknown" to "known known," a new market is constructed in which citizens and construction companies seek to outmaneuver one another, and, at times, to maneuver with each other. On the other hand, when we open the black box of the other network, which is comprised of private risk assessment companies, engineers, buildings, cement, steel bars, laboratory results, and the Earthquake Code, we see that this time the risk is defined in a different way. Thus, the very same building that is examined can be subject to either demolition or preservation, contingent upon the chosen method of risk assessment – either in accordance with Law No. 6306 or the Earthquake Code. The multiple risks attached to the same building highlight that any building labeled as risky may paradoxically be in fact at risk of demolition: they are more at risk themselves than they are a risk to people.

Acknowledgments. The fieldwork underpinning this article was supported by the Center for Spatial Justice (Mekanda Adalet Derneği). Their invaluable contributions are gratefully acknowledged.

Competing interests. There are no competing interests to declare.

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Cite this article: Kayaalp, Ebru (2024). Engineering, law, and the anticipated İstanbul earthquake. *New Perspectives on Turkey* 1–17. https://doi.org/10.1017/npt.2024.31