Earthquake in Turkey and Is Impact on Business: An Analysis of Facebook/Meta Data

20.03.2023

On 6 February 2023, 7.8 and 7.5 magnitude earthquakes struck southern and central Turkey and northern and western Syria. 6.4 and 5.8 magnitude earthquakes hit the same region two weeks later on 20 February 2023.

According to the official statistics, over 50k people died in Turkey and Syria. As a result, millions had to flee their towns, leaving hundreds of thousands to survive unsheltered in harsh weather conditions.

A strong mobilization of humanitarian assistance and solidarity movements including citizens and the international community have been organized to support the earthquake relief efforts. As we have been granted access to Facebook/Meta's "Data for Good" initiative, we aim to contribute to the works of the public and civil society institutions and inform the public on different aspects of the post-earthquake situation.

We will publish a series of data analysis reports on various topics, from mobility patterns to business activities; share these reports with the public and institutions; receive feedback and questions from organizations on the ground; and try to answer needs and understand the general trends.

This voluntary initiative brings together researchers from the University of Oxford, Cambridge, and Koç University. Dr Emre Eren Korkmaz (University of Oxford) has the right to access these datasets. Junjie Tan and Thomas Serban Von Davier from the University of Oxford analyzed datasets. The report was written by Dr Merih Angın (Koç University), Dr Tuba Bircan (University of Cambridge), and Dr Emre Eren Korkmaz (University of Oxford). Elena Harriss-Bauer (University of Oxford) edited the final version of the report.

This report will provide brief background information and share our findings. This effort is intended to allow researchers, journalists and humanitarian support organizations to access the data, which we have contextualized with analysis.

Business Activities after the Earthquake

There are few studies that focus on estimating the aftermath of the earthquakes in Turkey, and in particular their effect on local businesses. The latest information on the damage assessment in 11 provinces in the earthquake zone was provided on February 24, 2023 by the Ministry of Environment, Urbanization and Climate Change (ÇŞİDB). It was reported that 164.321 buildings and 520.000 independent units in these buildings were destroyed or severely damaged among 4.511.000 independent units in 1.250.000 buildings that were examined in damage assessment studies. The information by the Ministry did not differentiate the number of workplaces and public institutions in different sectors where goods and services are produced.

To give a better picture, scholars (Yilmaz, 2023) estimated that among the non-residential buildings and independent units, 27.000 were destroyed or severely damaged, 12.000 were moderately damaged and 56.000 were slightly damaged. Since there is no official information regarding the distribution of the sectors among the business-related buildings/structures, our analyses provide the most detailed information available so far.

1- The most drastic decrease in business activities in the affected areas is observed in the public goods sector[1].

The Facebook/Meta datasets show that **between February 15 and 21**, the most drastic decrease in business activities in affected areas is observed within **the public goods sector**.

While other sectors display heightened activity **between March 3 and 11**, the public goods sector loses momentum and underperforms other sectors in terms of average business activity. More strikingly, even the businesses related to public goods located outside earthquake areas saw a decline in activity between February 15 and 21. The majority of schools were closed across Turkey, while higher education institutes switched to online instruction and repurposed student accommodations to house earthquake victims. Non-residential higher education buildings (including classrooms, auditoriums and staff offices) in many areas were not in use during this period. **As of March 5, the public goods sector has seen increased activity outside affected areas.**

The erthquakes caused extensive damage to Turkey's public infrastructure: the electricity supply, water and sewage systems were affected; so were transport infrastructures, including ports, railways, and roads; public services including hospitals, schools, police stations, public offices, religious buildings, etc. were also deeply affected. This damage severely disrupted access to essential services such as healthcare, water, sanitary, electricity and education. To minimise the impact of earthquakes on public goods, more efforts are needed to build earthquake-resistant structures and to develop emergency response plans. To conclude, investing in infrastructure is crucial to ensuring resilience to natural disasters and sustaining access to public services in the aftermath, which become even more significant during a crisis.

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[1] "In economics, a public good refers to a commodity or service that is made available to all members of a society. Typically, these services are administered by governments and paid for collectively through taxation.

Examples of public goods include law enforcement, national defense, and the rule of law. Public goods also refer to more basic goods, such as access to clean air and drinking water."

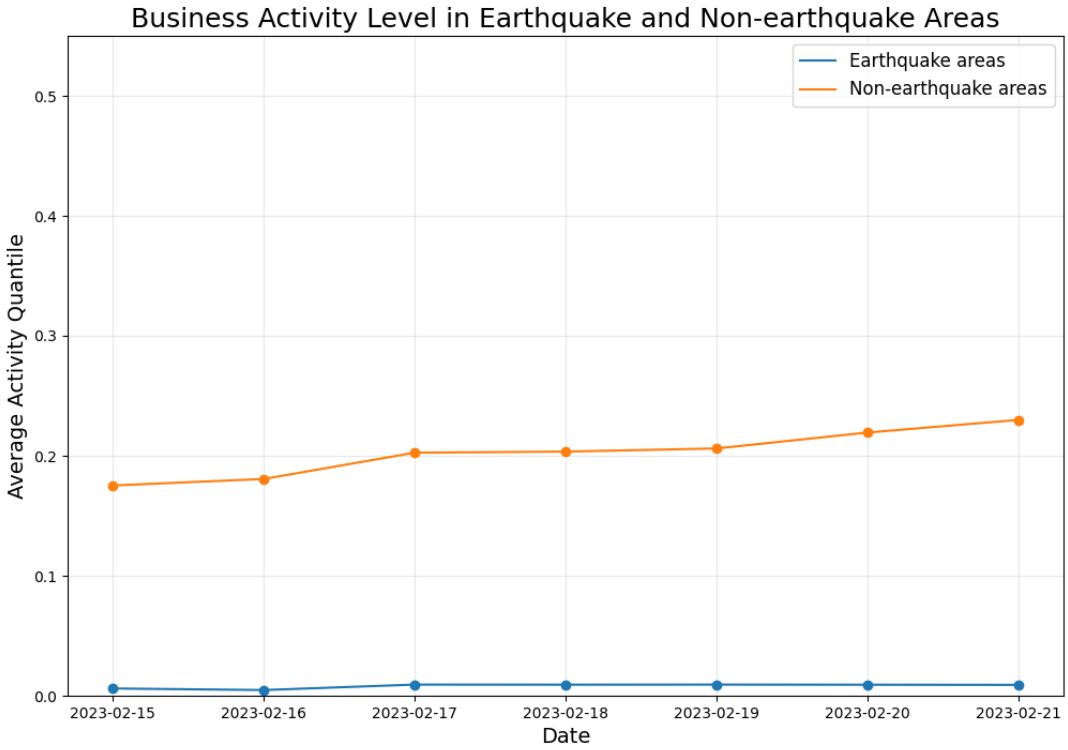
(Jason Fernando, What Are Public Goods? Definition, How They Work, and Example, 20.03.2022, https://www.investopedia.com/terms/p/public-good.asp)

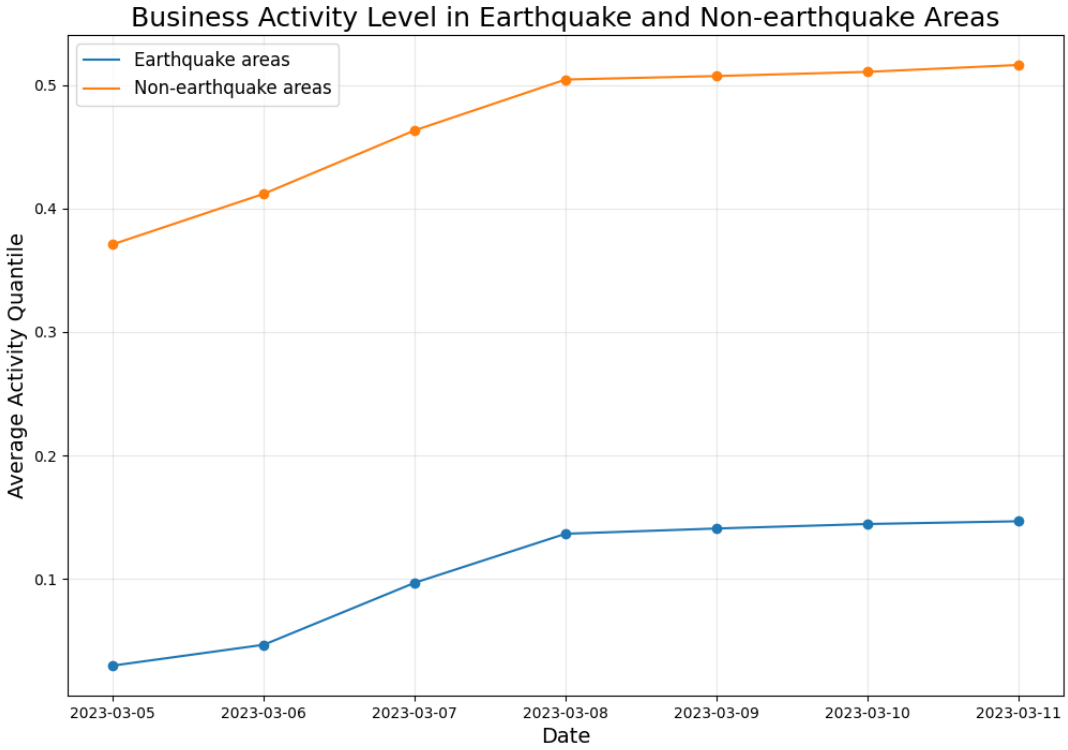
2- The highest value-add generated in the manufacturing industry, which accounts for 7.83% of Turkey's total, is realized in the 5 provinces most affected by the earthquake.

As a result of the destructive impact of the earthquakes, it is estimated that the Turkish economy will face a loss of 77.4 - 104.8 billion dollars (between 8.6% and 11.6% of national GDP, with an average of 91 billion dollars or 10.1% of GDP). Taking into account the amount of 31.3-40.7 billion dollars that will be spent for reconstruction investments during the year, in addition to the negative effect of the earthquake on production, it is estimated that the growth throughout 2023 could increase between 2.4 and 2.6 per cent with the impact of additional investments. While the growth rate may decrease between 2.5 and 4.2 percentage points in the first quarter due to the earthquake's impact, in the second quarter, the earthquake may contribute a net additional 1.7 percentage points to the growth rate as a reflection of some of the adverse effects on production and with the activation of expenditures. The full activation of spending in the third and fourth quarters can positively affect the growth rate by a maximum of 3.7 to 5 percentage points (Tezcan, 2023).

At the sectoral level, the highest value-added generated in the manufacturing industry, which accounts for 7.83% of Turkey's total, is realized in the 5 provinces most affected by the earthquake. The share of these 5 provinces in other sectors is below 5%. Among them, Gaziantep, which has a population share of 2.53% and realizes 4% of Turkey's total industrial production, stands out. Its share in the total GDP is 2%. It also accounts for 8.72% of Turkey's total exports and about half of the region's exports. (Tezcan, 2023) Therefore, the loss in Gaziantep is significant vis-a-vis the earthquake's impact on industry and exports.

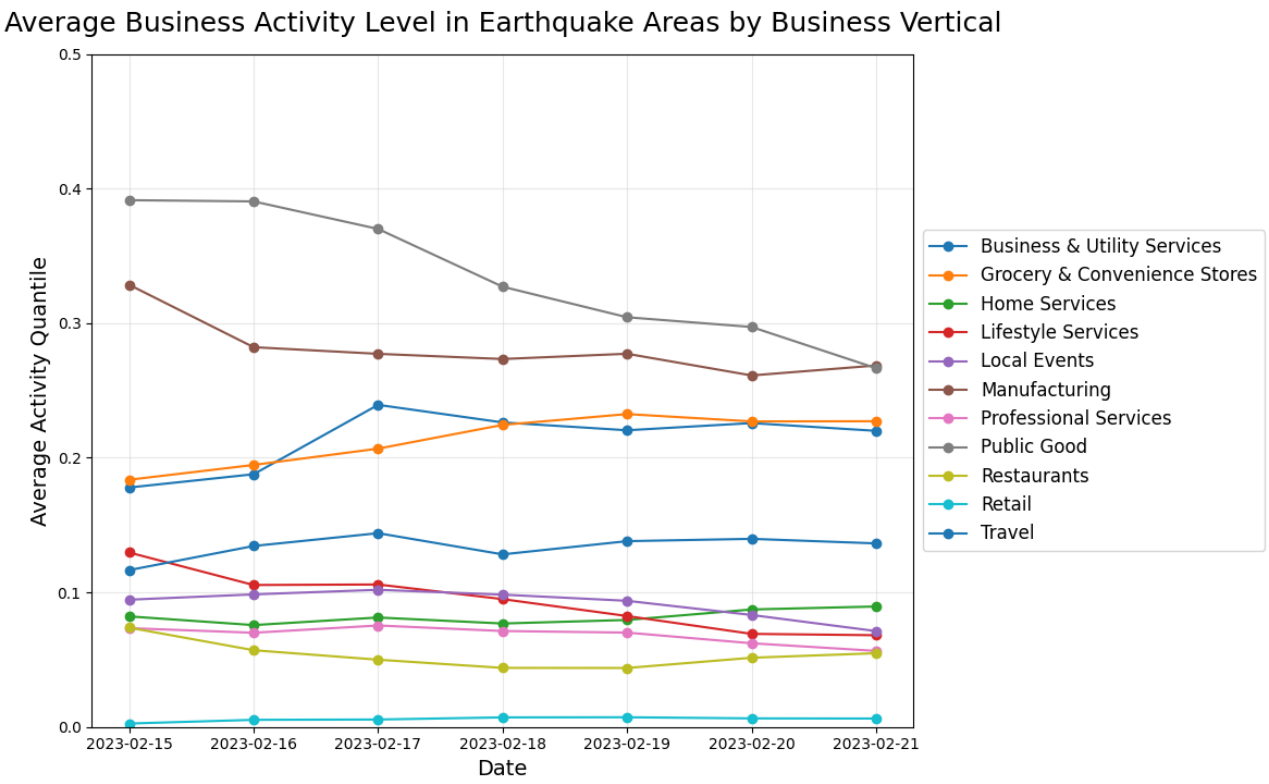
Comparison of business activity level on Feb 15th and on March 5th

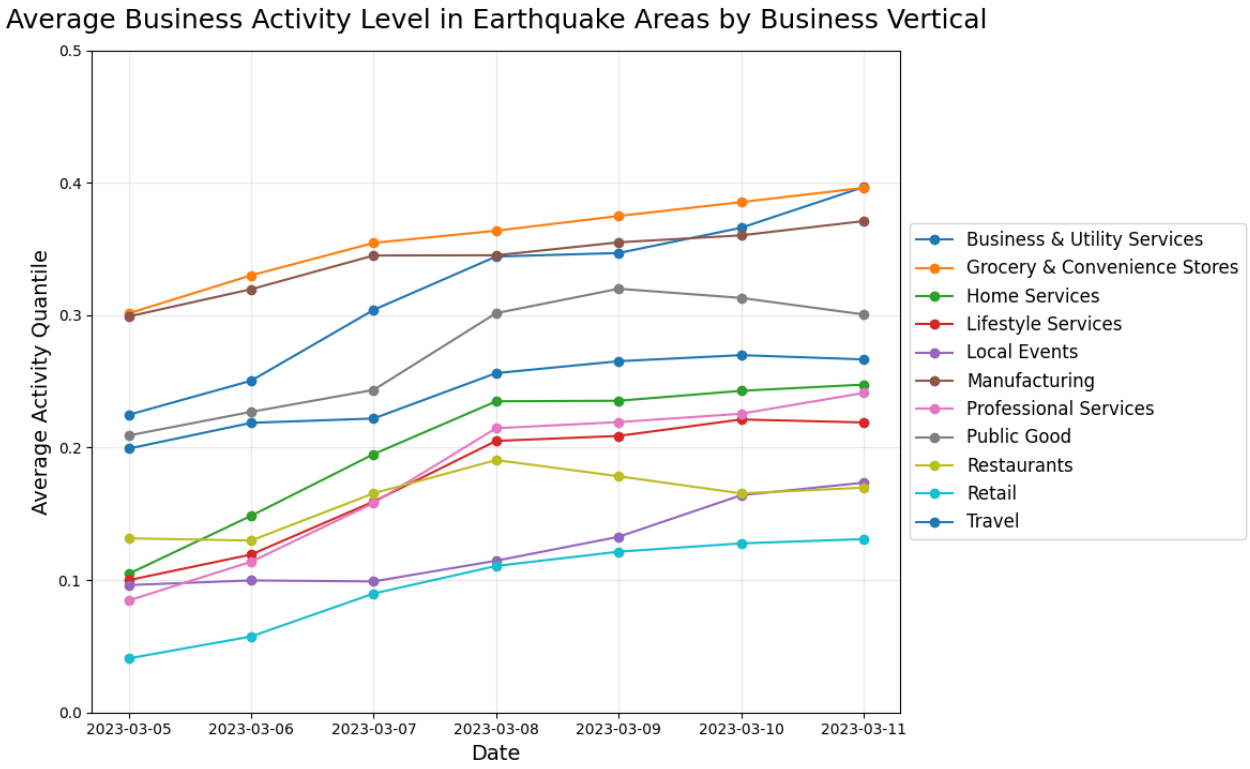




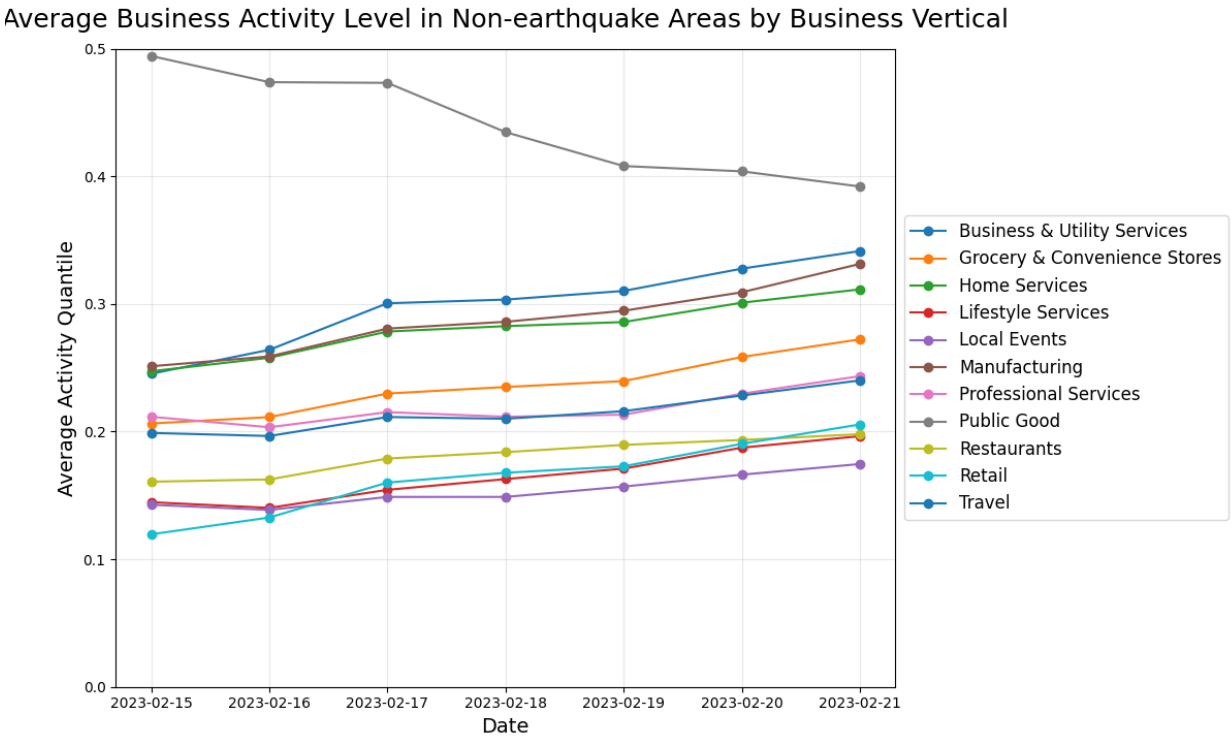
A substantial difference is observed between the average business activity level in earthquake areas and non-earthquake areas. The index of activity quantile covers all business vertical.
Earthquake areas are defined as the following regions: Adıyaman, Kilis, Osmaniye, Gaziantep, Malatya, Elazığ as well as Şanlıurfa, Diyarbakır, Adana and Hatay. Regions source: https://reliefweb.int/report/turkiye/turkey-earthquake-emergency-situation-report-21022023

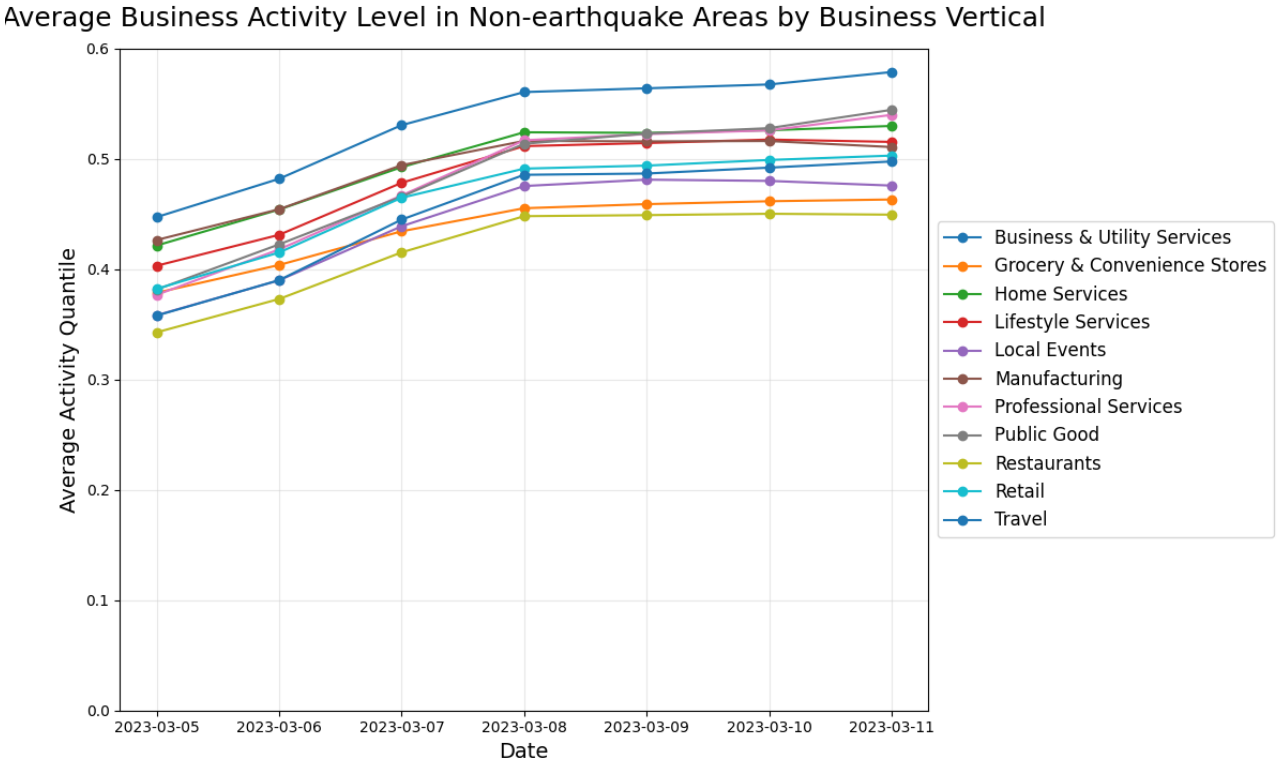
Comparison of business activity level in earthquake areas on Feb 15th and on March 5th



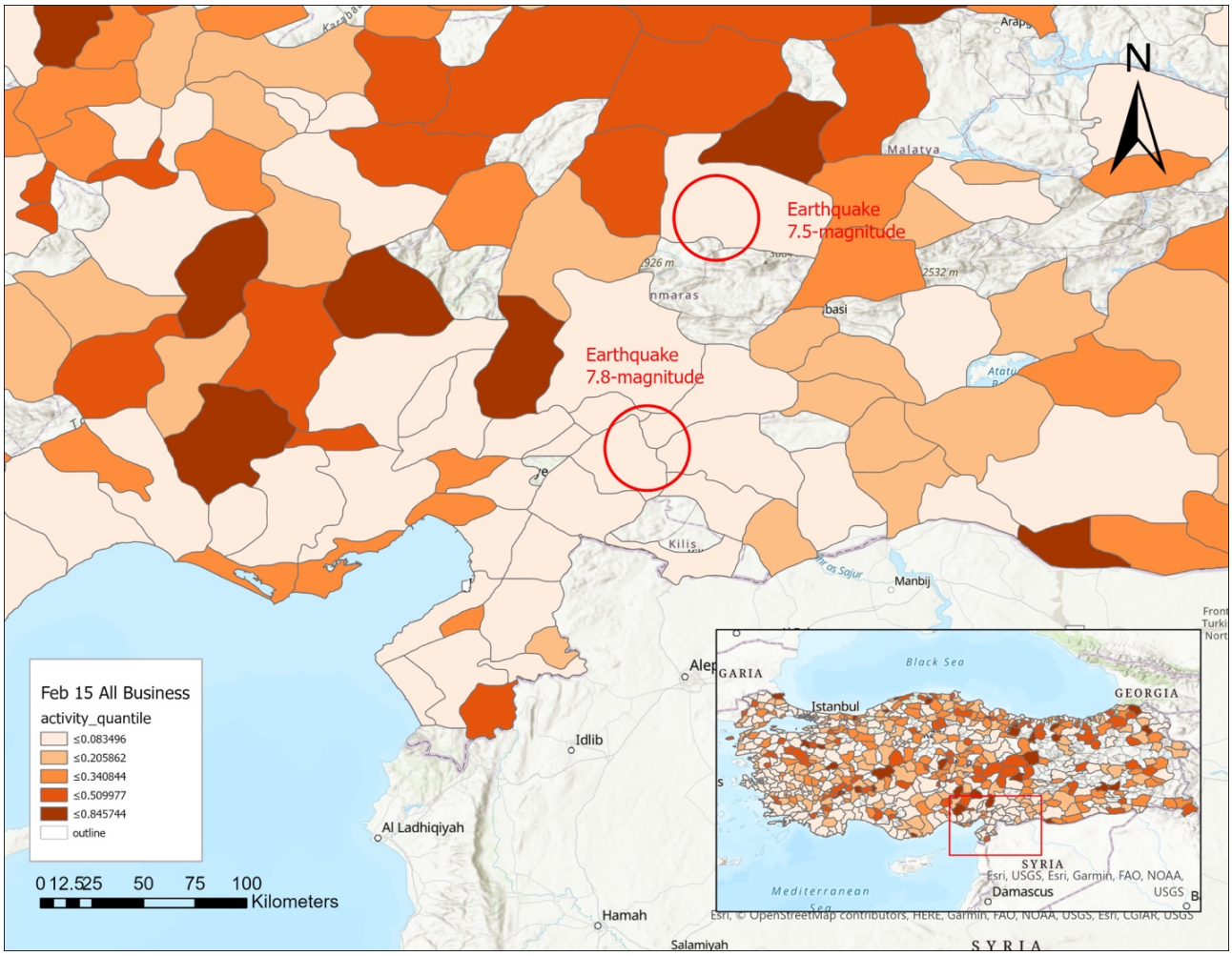


Comparison of business activity level in non-earthquake areas on Feb 15th and on March 5th

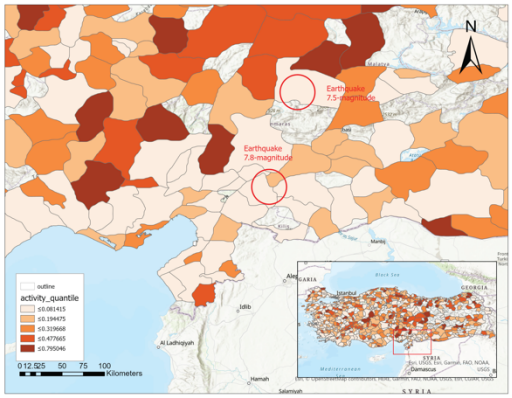




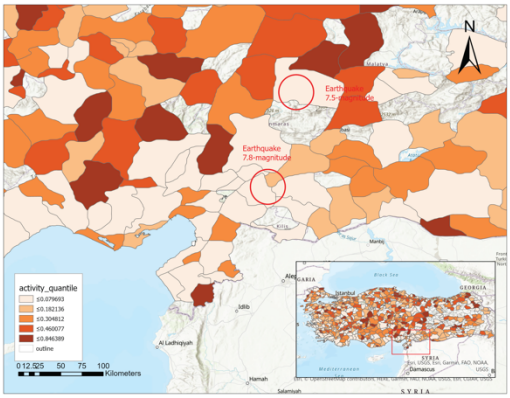
Business Activity Level in Earthquake Regions on Feb 15, 2023



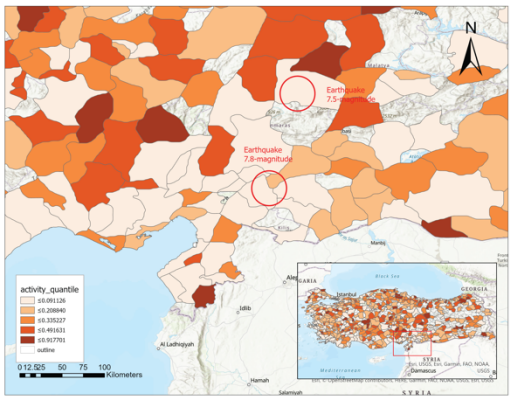
Business activity level in earthquake regions from Feb 16 to Feb 21, 2023



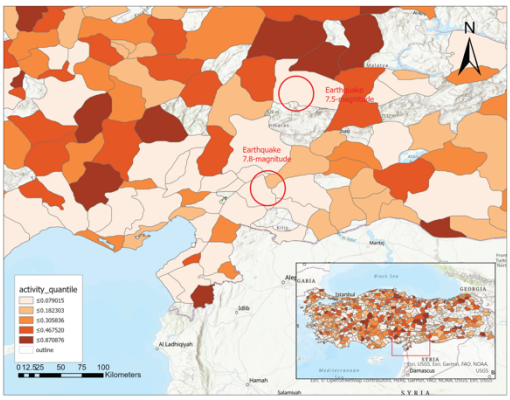
Feb 16



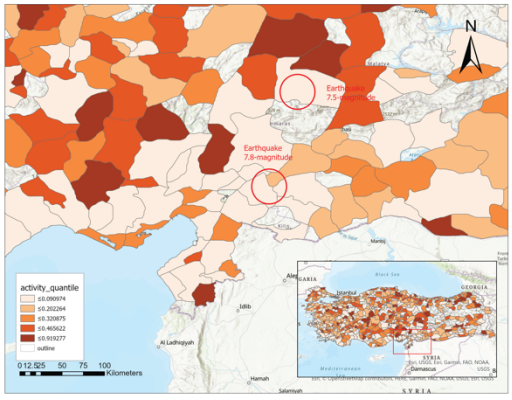
Feb 17



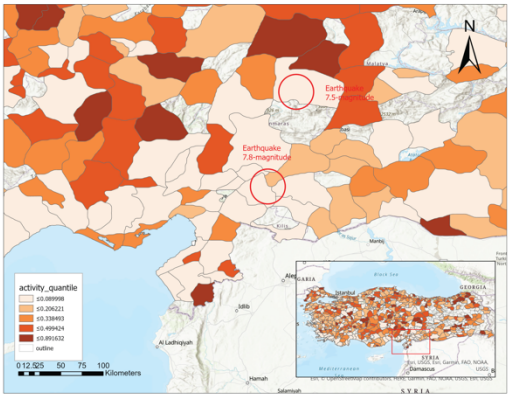
Feb 19



Feb 18



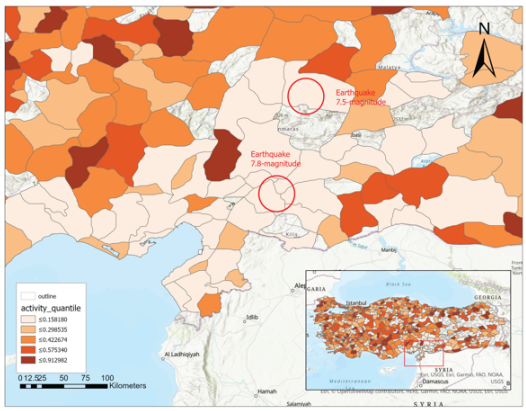
Feb 20



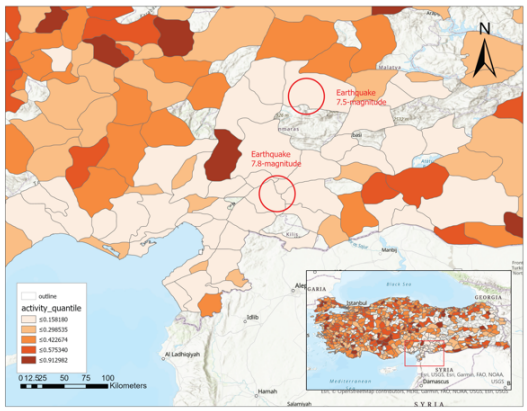
Feb 21

Observation: no significant changes in the overall business activity levels around earthquake regions from Feb 16 to Feb 21.

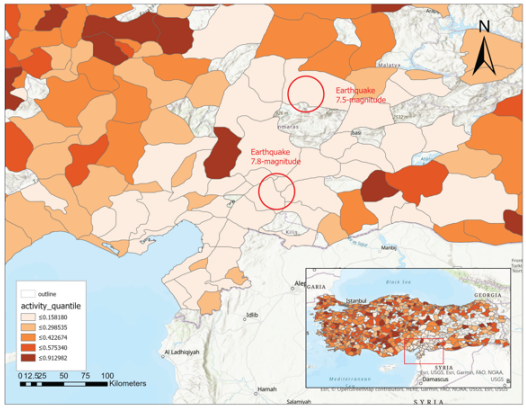
Business activity levels in earthquake regions are significantly lower (40% - 60%) than that of in other regions of Turkey.



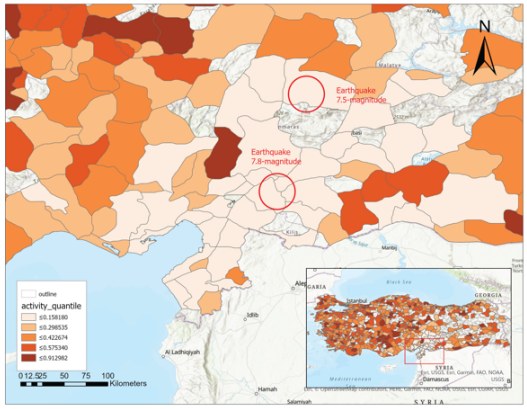
March 5



March 6



March 7



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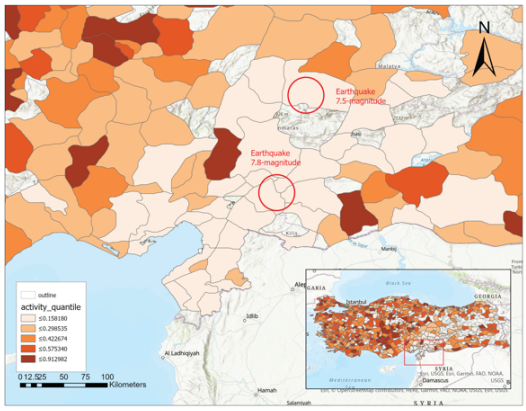

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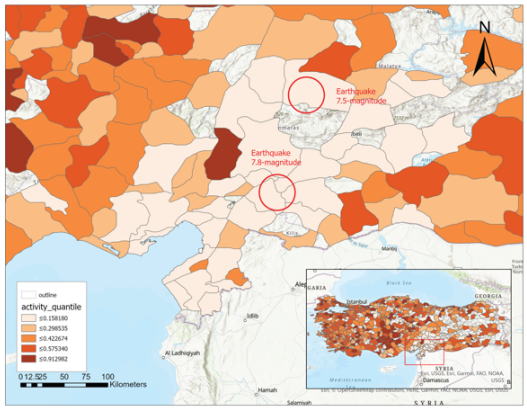
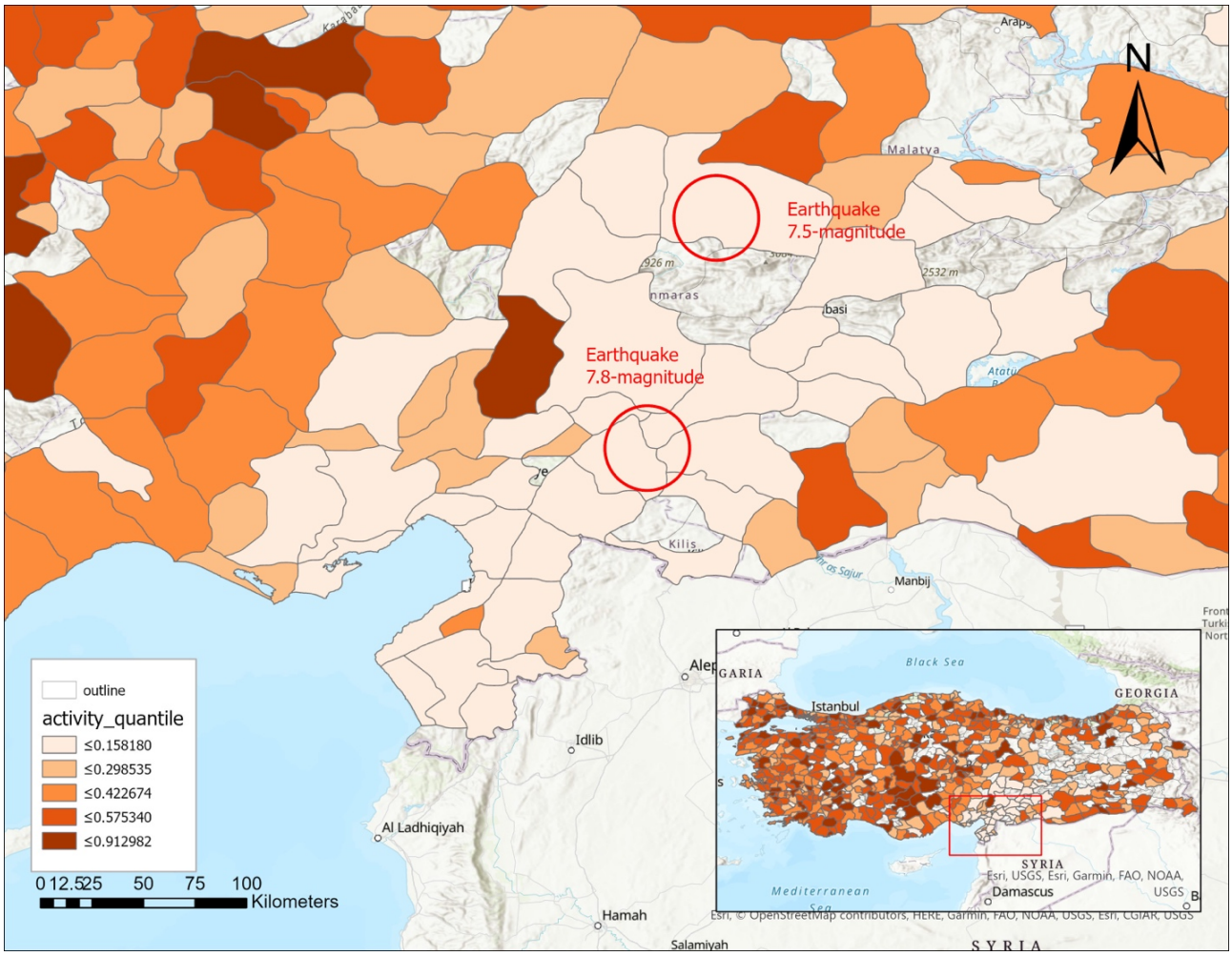


March 10

Business Activity Level in Earthquake Areas on March 11, 2023



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