

GREECE FOCUS NOTES

Note on the impact of Thessaly floods

Introduction

- This Note attempts an assessment of the potential impact of recent floods in Thessaly on GDP growth, inflation, employment and residence in the area, current account and public finances. Although crucial information is still unavailable for producing an exact estimate, the perimeter of damage is analyzed, also utilizing international experience. It prevails that, as the frequency and severity of natural disasters seems to increase along with climate change, this comprises a longer-term risk for households, enterprises, and public economics. Strong, proactive and coordinated planning and policy action is required in order to prevent this from inflicting blows in the wellbeing and the fame of the country.

1. GDP losses

An exact estimate of the impact of the floods in Thessaly on the macroeconomic measures of the Greek economy is currently very hard to measure given that neither the size of the damage nor that of fiscal support measures (as well as their composition and timing of launching) can be reliably

assumed. The perimeter of damage can be approximated if one considers that the region of Thessaly contributes the 5.2% of total GVA produced in Greece (and the 6.4% of total employment). Out of this share, 13.0% comes from agriculture, forestry and fishing, and 13.4% from manufacturing, i.e. the two sectors with the largest losses due to the floods (see graphs). Hence:

$$\frac{\text{GVA in Thessaly}}{\text{GVA in Greece}} * \left(\frac{\text{Agriculture, forestry and fishing GVA in Thessaly}}{\text{GVA in Thessaly}} + \frac{\text{manufacturing GVA in Thessaly}}{\text{GVA in Thessaly}} \right) = 5.2\% * (13.0\% + 13.4\%) = 1.4\% \text{ of total GVA in Greece.}$$

Total GVA in Greece in 2022 stood at €182.7bn (1.4%*182.7 = €2.5bn) and GDP at €208.0bn (1.4%*182.7 = €2.9bn). Estimates are that ca 23%

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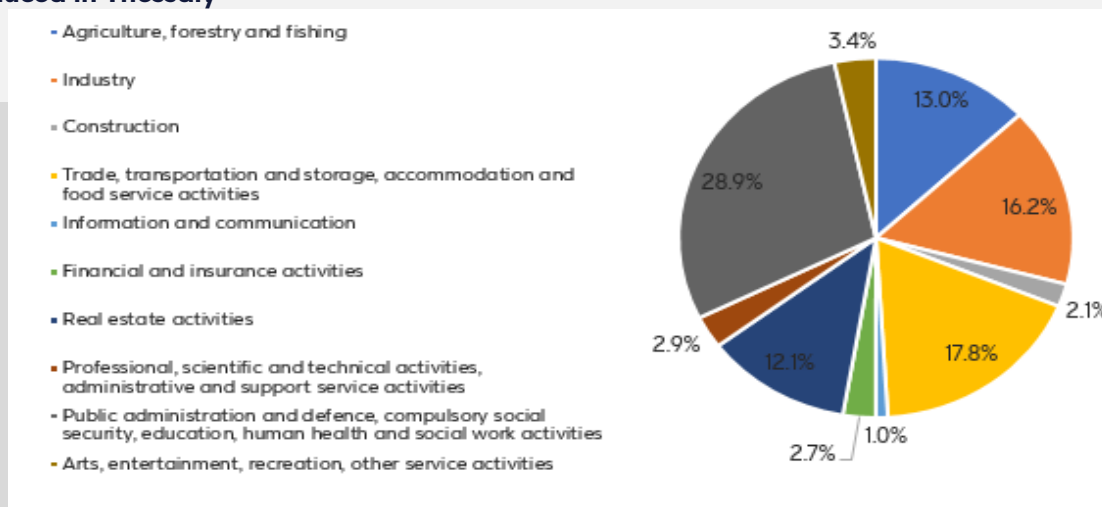
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Figure 1: Greece – Contribution of 10 Sectors of Economic Activity in Total Gross Value Added Produced in Thessaly



Sources: ELSTAT, Eurobank Research

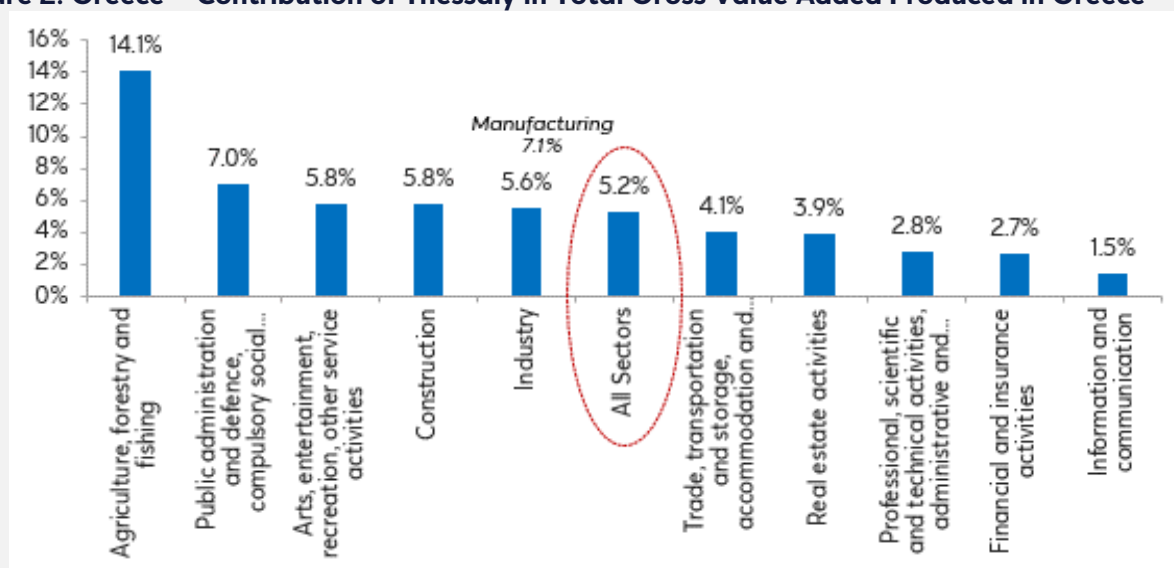
of land used for agriculture and industry in Thessaly has been flooded (estimate to be updated when newer satellite images become available). Hence, the perimeter of annual output loss in these two sectors is $€2.5\text{bn} \times 0.23 = €0.6\text{bn}$ or in market prices $€2.9\text{bn} \times 0.23 = €0.7\text{bn}$.

In addition, GDP may negatively be affected by the drawdown of inventories as many storage houses have been destroyed. Further, other sectors in Thessaly, except agriculture and manufacturing, will also be indirectly affected (e.g. trade, storage, transportation). On the other hand, it cannot be assumed that the totality of the production in the said sectors will be lost this year; manufacturing in particular has already sold part of its production. What's more, a large part (or all of) the loss in incomes will be replenished by fiscal support measures. Yet, it is still not well-known what size of funds will be dedicated in repairing the damage and supporting incomes of those affected, on which projects, and at what horizon of disbursement, let alone launching the projects:

EC President von der Leyen spoke on 12.9.2023 about mobilizing €2.25bn of EU support funds, yet it is not clear how much of it is fresh money: part of it comes from unspent cohesion and CAP money from the last period, which would otherwise be lost, so it could be considered as fresh money (estimated at €0.25bn), but the bulk of it (estimated at ca €2.00bn) is from re-directing uses to money from the current programmes, so it is not fresh money. In addition, there has been a discussion about funding from the Solidarity Fund (currently estimated at €0.40bn) and a third request for Recovery and Resilience Fund (RRF) money; both are uncertain if they can be secured.¹

- Prime Minister Kyriakos Mitsotakis announced on Saturday, September 16, a series of measures during his state-of-

¹ For more information: https://ec.europa.eu/commission/presscorner/detail/en/statement_23_4441

Figure 2: Greece – Contribution of Thessaly in Total Gross Value Added Produced in Greece


Sources: ELSTAT, Eurobank Research

the-economy speech at the Thessaloniki International Fair including:²

- the establishment of a water management entity for the Thessaly region,
 - the proposal for making property insurance mandatory for certain types of firms,
 - the extension of the funding of the natural disasters emergency buffer from €0.30 bn to €0.60bn via the introduction of a special tax in the hospitality sector.³
- On top of EU money there will be national budget money and private aid (including of banks').⁴ The Ministry of Finance (MinFin) announced that a supplementary budget of €0.60bn is to be submitted to the parliament in the following days, increasing the regular

budget by €0.15bn and the Public Investment Budget by €0.45mn).

- MinFin also announced infrastructure projects of ca €2.2bn to boost resilience against natural disasters, funded by EU cohesion funds (ESPA 2014–20 and 2021–27) and the RRF

All things considered, comparing the perimeter of sectors directly hit with the fiscal support envelope, immediate GDP losses might be limited. On the other hand, there will also be secondary effects on GDP:

- Part of Thessaly's output was intermediate goods, used as a production input in industries in the rest of Greece. These will have to be substituted with other, most likely imported and more costly inputs, and as a result the total loss for the economy will be larger than the GVA lost in Thessaly.

² For more information (in Greek): <https://www.primeminister.gr/2023/09/16/32545>

³ These measures are expected to increase the resilience of the economy in case of future incidents and limit their fiscal repercussions, yet they do not provide information on the size of the

fiscal boost for reparation and building of infrastructure in the current occasion. See also fiscal impact section below.

⁴ €50mn of aid, freeze of performing loan repayments and foreclosures up to the end of 2023, for more information see: <https://www.hba.gr/Media/Details/544>

- The purchasing power of many Thessalians, especially those who have suffered most from the disaster, and their propensity to consume goods and services will be reduced in the short run (due to the objective inability to consume and until support measures kick in). This may adversely affect the demand for other regions' output, although this shouldn't be quantitatively very large.
- Transportation and logistics have been adversely affected. The main highway and railroad connecting the North and South of the Greek mainland were flooded and inaccessible for almost a week (that's 1/52 or nearly 2% of a year, which is non-negligible). The highway opened on September 18, but the railway is still out of order and will remain for a long time.⁵ As a result (a) goods from the South cannot get to the North and vice-versa (or have to take a longer and more costly detour) and (b) goods entering the country from the hub port of Piraeus will find it hard (and costlier) to get exported.

Furthermore, a longer-term impact may exist: it cannot be assumed that the damage will be fully reversed next year, given that infrastructure and private capital goods need time to be replenished, even if money is available. Hence some shock on the supply side of the economy should be assumed and, subsequently, some impact on long-term potential GDP. What usually happens after wars and large disasters is a large negative impact in the very short term, but then a positive effect on output as reconstruction begins, investment goes up and output gets back on track. On a more comforting note, given that only a relatively small part of the country was affected, both

these effects will be relatively modest at the country level.

To wit, GDP losses will likely be limited as the destruction of production and infrastructure will be largely compensated for by fiscal support measures and the subsequent boost on incomes, consumption and investment, yet some longer-term effects from the supply shock cannot be excluded.

Impact on inflation: An increase in inflation is likely (current forecast of 4.3% for FY 2023), as the destruction of production and infrastructure will cause shortages (and possible information cascades). Food prices are expected to be affected relatively more severely, given the significant share of Thessaly in domestic agricultural production. Again, timing and extent are difficult to predict.

Impact on the current account: Negative impact, as lost production (especially in agricultural products), will need to be replaced by imports, and damage in production capabilities will also hurt exports. The impact may potentially be longer term if goods from Thessaly that were exported abroad are substituted away, so that even when production in Thessaly is restored (which for some agricultural products may take even a year or longer), it may not find its earlier position in international supply chains and may need to find new buyers for their products.

Impact on the fiscal balance: In addition to the supplementary budget of €600mn mentioned above, an additional €35mn will be transferred to the residents of the areas who suffered from the recent floods and wildfires, primarily in the region of Thessaly and the regional unit of Evros in northeastern Greece, in the form of food vouchers ("Market Pass"). Nevertheless, the overall fiscal impact this year is expected to be limited,

infrastructure at ca €0.16 bn. The railway that connects northern and southern Greece could remain closed for up to a year.

⁵ According to press reports, the Hellenic Railways Organization estimates the costs of repairing the damaged tracks and related

as a large part of the support will come from EU money, while the national budget also has a buffer to tap in. In addition, public revenue has been overperforming targets systematically so far, hence providing degrees of freedom for covering increased support measures without deviating from the target of a 0.7% of GDP primary surplus (the Government was already expecting an overperformance toof a 1.1% surplus before the floods).

Still, this implies that inflation relief measures will have to be curtailed (e.g., skipping a round of “Market Pass” for households in the non-affected regions that was being considered). This could adversely affect the purchasing power of lower-income households in what is expected to be a difficult winter (fuel prices on the rise, food prices already high and may increase further –, especially following the floods, interest rates expected to stay high for long, and we should not overlook that this is the third winter of inflationary pressures in a row).

From 2024 onwards, MinFin estimates the additional cost of disaster prevention and relief cost at €300mn annually, 80% of which, as mentioned by the Prime Minister, is expected to be funded through a lodging tax on hotel and other short-term accommodation guests.

Impact on employment and population in the countryside:

Given that a lot of private physical capital, infrastructure and natural resources have been severely damaged, employment will be negatively affected. Moreover, a lot of people staying in the countryside may move to the four big cities of the Thessaly region (Larissa, Volos, Trikala and Karditsa).

The risk of the country in terms of natural disasters increases: the frequency and severity of natural disasters seems to increase along with

climate change, and this comprises a longer-term risk for growth, household and firm budgets, as well as for public economics. Strong, proactive and coordinated planning and policy action is required in order to prevent this from inflicting blows in the wellbeing and the fame of the country.

Table 1: The economic cost of international natural disasters (mainly floods)

Date	Country & Description	Cost (Monetary & GDP)	Comments
2002	Germany, Czech Republic, Austria (Central European Floods)	€20bn (~0.8% of Germany's GDP, ~2.9% of Czech Republic's GDP)	Triggered a re-evaluation of flood risk management in Europe
2005	United States (Hurricane Katrina)	\$125bn (~0.96% of U.S. GDP)	Massive infrastructure damage, particularly in New Orleans, and long-term costs like rebuilding and healthcare
2007	United Kingdom (UK Floods)	£3.2bn (~0.2% of UK's GDP)	Had a strong impact on agriculture and insurance markets
2010	France (Xynthia Storm)	€1.4bn (~0.07% of France's GDP)	Led to substantial changes in coastal management policies
2010	Pakistan (Pakistan Floods)	\$9.5bn (~4.2% of Pakistan's GDP)	Extensive agricultural losses, displacement, and long-term healthcare challenges
2011	Thailand (Thailand Floods)	\$45bn (~12.2% of Thailand's GDP)	Severely disrupted global supply chains and led to long-term economic repercussions
2014	Bosnia and Herzegovina, Croatia, Serbia (Southeast Europe Floods)	€3.5bn (~4.1% of combined GDP)	Resulted in significant infrastructure damage and long-term environmental and healthcare costs
2014	Southeast Europe (Southeast Europe Floods)	€3.5bn (~4.1% of combined GDP)	Significant infrastructure damage and long-term environmental and healthcare costs
2018	Italy (Italian Floods)	Over €1.0bn (~0.06% of Italy's GDP)	Led to renewed calls for improved flood defenses and climate adaptation strategies
2019	United States (Mid-western U.S. Floods)	\$3.0bn (~0.014% of U.S. GDP)	Impacted mostly the agricultural sector but had long-term effects like higher food prices and strains on rural economies
2021	Belgium & Germany (July 2021 European Floods)	€2.0bn (~0.4% of Belgian GDP) and €40.0bn (~1.1% of German GDP)	Flood event affected parts of Belgium, Germany and surrounding countries, causing more than 200 fatalities and resulting in large socioeconomic impacts. 43 persons reported dead in Belgium, 184 persons in Germany

Sources: European, Commission, Eurobank Research, European Environment Agency, National Authorities of various countries, USNOAA, World Bank, Press reports

2. The international Experience

According to the European Environmental Agency, between 1980 and 2021, the European Union Member States experienced staggering economic losses totaling approximately €560 billion due to weather -and climate- related extreme events. Alarming, €56.6 billion of these losses (10,1%) were incurred in 2021 alone. Analyzing the trends in these economic losses presents a challenge due to the high year-to-year variability. Nonetheless, statistical analyses have indicated a concerning upward trajectory in financial damages over time.

As the frequency and intensity of severe weather and climate-related extreme events are projected to escalate, it appears increasingly unlikely that the associated economic toll will diminish by 2030. This trend underlines the urgent need for proactive measures to mitigate the devastating economic impact of these environmental hazards.

Table 1 presents recent examples of natural disasters (focus on floods and flood related events) and their cost for the countries under question.

The aftermath of the flood and storm cases described above varies significantly depending on the scale of the disaster and the size of the affected country's economy. For example, the Central European floods of 2002 triggered a re-assessment of flood risk management in Europe. This was evident in Germany, where the financial burden of the disaster amounted to approximately 0.8% of the GDP. This critical incident acted as a catalyst for significant policy changes and set the stage for a subsequent reevaluation

in 2021, following the devastating July floods in Belgium and Germany.^{6, 7}

The 2007 floods in the UK had a relatively lower impact, of ca 0.2% of GDP. Nonetheless, the event had a profound influence on agriculture and insurance sectors, leading to strategic shifts in land-use planning and flood risk management.

When we look at smaller and less developed economies, the relative economic impact of such disasters tends to be considerably higher. A case in point is the 2010 floods in Pakistan, which consumed about 4.2% of the country's GDP. The catastrophe resulted in extensive agricultural losses and posed long-term healthcare challenges, thereby exacerbating existing vulnerabilities.

This often necessitates more comprehensive responses, including:

- **Proportional Impact on GDP:** The economic toll of natural disasters is often more pronounced in smaller economies, where sectors like agriculture play a more substantial role. This proportionality necessitates a more comprehensive response strategy⁸
- **Cascading Effects:** Natural disasters have ripple effects across multiple sectors—ranging from infrastructure and environmental degradation to healthcare systems and social welfare—making recovery a complex and multi-dimensional endeavor⁹
- **Policy Reevaluation:** Such events often serve as inflection points, compelling governments to rethink public policies,

⁶ For more information on the EU/Eurozone natural disasters: <https://www.eea.europa.eu/ims/economic-losses-from-climate-related>

⁷ For more information on the 2021 July floods (Belgium, Germany): <https://climate.copernicus.eu/esotc/2021/flooding-july>

⁸ For more information: Botzen, W. W., Deschenes, O., & Sanders, M. (2019). The economic impacts of natural disasters: A review of

models and empirical studies. Review of Environmental Economics and Policy.

⁹ See Lawrence, J., Blackett, P., & Cradock-Henry, N. A. (2020). Cascading climate change impacts and implications. *Climate Risk Management*, 29, 100234.

- particularly those related to land use and environmental conservation¹⁰.
- Investment in Preparedness: They also highlight the urgent need for investing in disaster preparedness measures, such as early warning systems, resilient infrastructure, and community awareness programs¹¹
 - Focus on Climate Adaptation and Economic Resilience: Given the increasing frequency and intensity of extreme weather events due to climate change, a focus on climate adaptation strategies and building economic resilience has become more important than ever¹².

¹⁰ See Hallegatte, S. (2015). The indirect cost of natural disasters and an economic definition of macroeconomic resilience. World Bank policy research working paper, (7357).
Srinivasan, T. N., & Rethinaraj, T. G. (2013). Fukushima and thereafter: Reassessment of risks of nuclear power. Energy policy, 52, 726-736.

¹¹ See Kunz, N., Reiner, G., & Gold, S. (2014). Investing in disaster management capabilities versus pre-positioning inventory: A new approach to disaster preparedness. International Journal of Production Economics, 157, 261-272.

¹² See Forni, L., Catalano, M., & Pezzolla, E. (2019). Increasing resilience: Fiscal policy for climate adaptation. Fiscal Policies for Development and Climate Action, 115.

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