Athens University of Economics and Business
Department of Informatics, MSc in Data Science

Data visualization and communication

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Pisa competition 2018

dynamic dashboard with **Tableau**

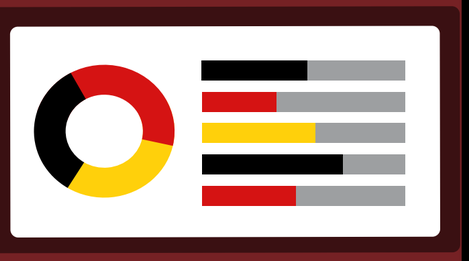
https://www.oecd.org/en/data/datasets/pisa-2018-database.html

Master Student:

Evangelia Panourgia, e-panourgia , evangelia-panourgia
(f3352402, https://github.com/e-panourgia/vizRTableau)

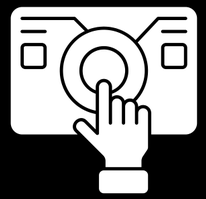
Tableau

Dynamic Dashboard



- **Glossary of Symbols**
- Dashboard Architecture Overview
- Domain Parameter
- Gender Advantage
- Gender Advantage Percentages and Hover
- Domain Scores Across Global, OECD, and European Groups
- MAP & Table Interaction
- Summary

Glossary of Symbols



= user interaction

When this symbol appears in the presentation, it indicates that the user can actively interact with that component of the dashboard. This interaction enhances the exploration and personalization of insights. Key interactive features include:

- Parameter Selection: Allows users to choose from multiple options (e.g., subject, year, gender) to dynamically update the visualizations.
- Hover Tooltips: Display additional information—such as charts, definitions, or contextual details—when hovering over elements (e.g., names like “Kris”).
- Interactive Map: Selecting a country on the map automatically filters the related data in the table below.
- Dynamic Table Highlighting: The selected country is instantly highlighted in yellow within the table for easy reference.

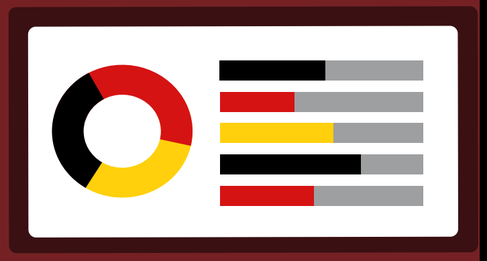
These features enable users to engage with the dashboard content in a flexible, intuitive, and insightful way.

= interaction of plots

When a country is selected on the map, the corresponding row in the table above is automatically highlighted (in yellow). This feature allows users to seamlessly link geographic selections with detailed data, enhancing clarity and cross-reference between visual and tabular components.

= idea for better analysis

Defined metrics enable more accurate comparisons across individual scores or values. To enhance insight, two interactive views are used to reveal relationships within the data through dynamic exploration.

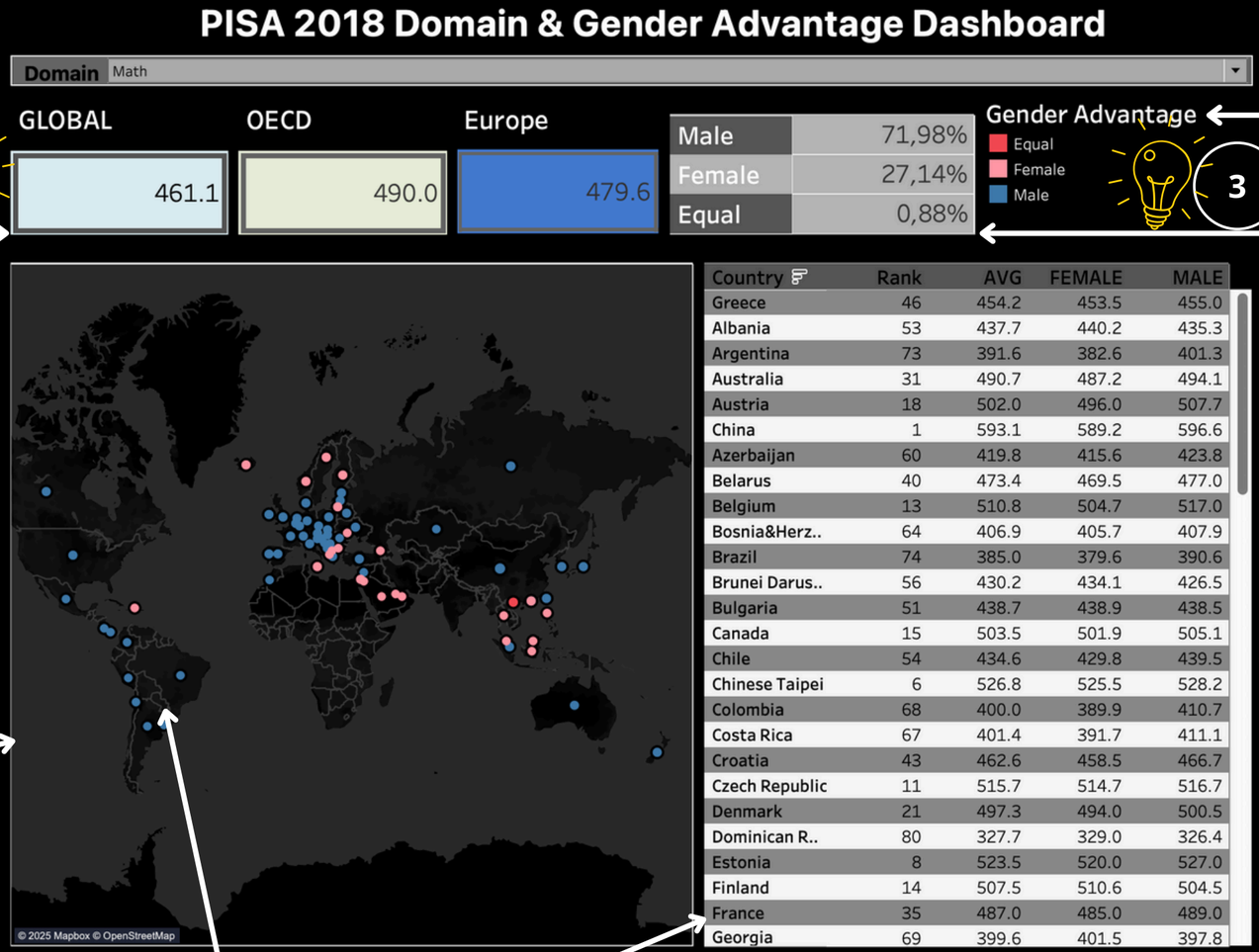


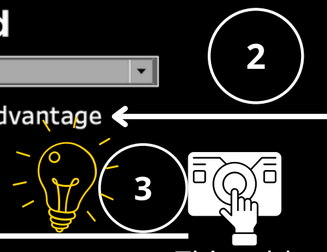
Dashboard Architecture Overview

Choose domain:
Subjects (incl. All)
or Global Competence.
Global Scope (all plots / KPIs are affected).

These boxes display the average scores for Global, OECD, and European country groups in the selected domain. Also, hovering displays up to the top 15 countries based on average score in the selected domain. Greece is highlighted in blue if it appears in the list.

The map displays countries colored by gender advantage (see Legend Ref. 2). Users can navigate the map—zoom in/out and pan—and hover over a country to view details such as name, gender advantage, average score, and gender gap. Defined metrics (see boxes Ref. 3) support more effective comparisons across individual scores or values (covering of blue vs pink dots.).





This legend indicates which gender outperforms the other in the selected domain.

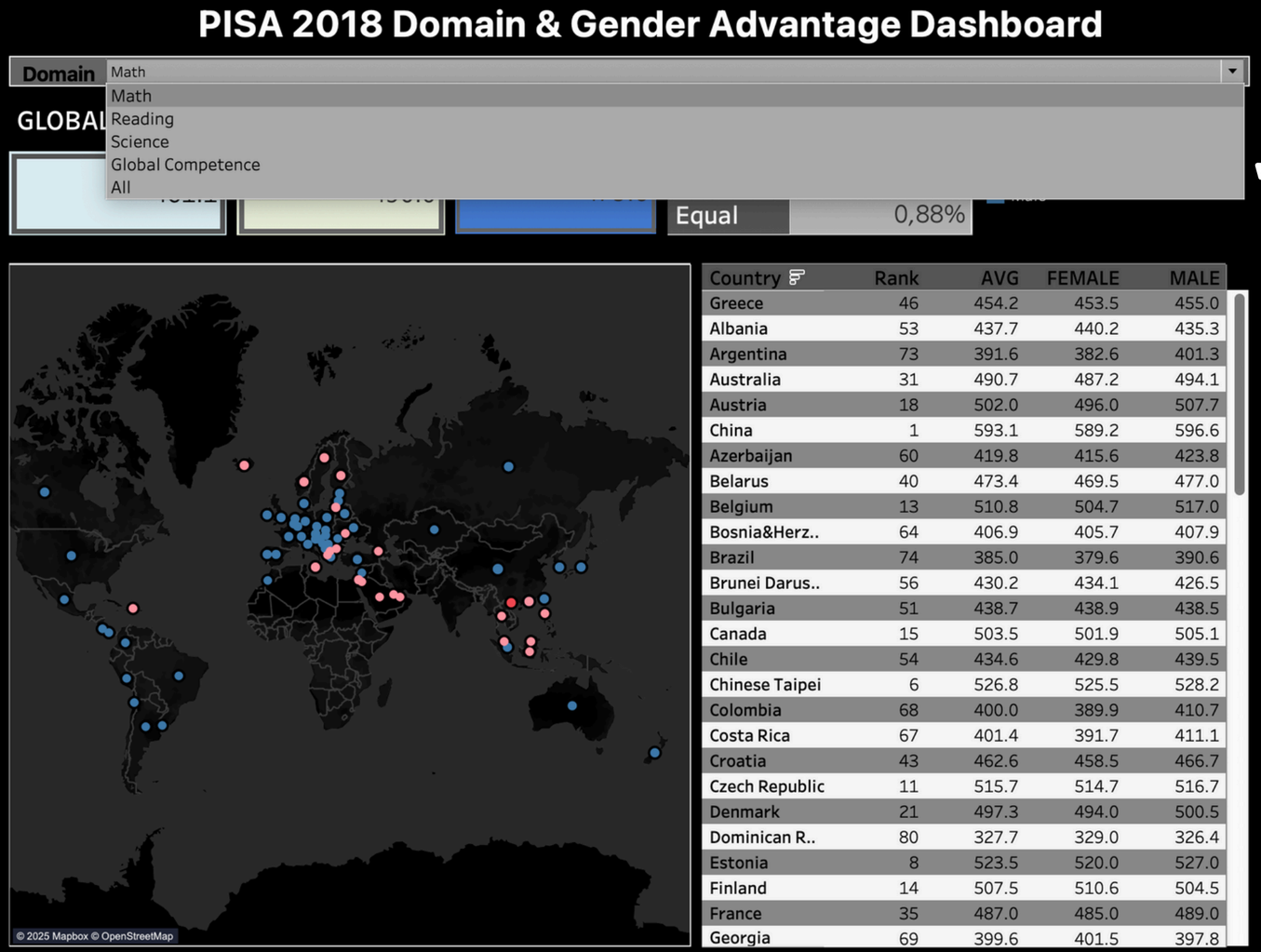
Country	Rank	AVG	FEMALE	MALE
Greece	46	454.2	453.5	455.0
Albania	53	437.7	440.2	435.3
Argentina	73	391.6	382.6	401.3
Australia	31	490.7	487.2	494.1
Austria	18	502.0	496.0	507.7
China	1	593.1	589.2	596.6
Azerbaijan	60	419.8	415.6	423.8
Belarus	40	473.4	469.5	477.0
Belgium	13	510.8	504.7	517.0
Bosnia&Herz..	64	406.9	405.7	407.9
Brazil	74	385.0	379.6	390.6
Brunei Darus..	56	430.2	434.1	426.5
Bulgaria	51	438.7	438.9	438.5
Canada	15	503.5	501.9	505.1
Chile	54	434.6	429.8	439.5
Chinese Taipei	6	526.8	525.5	528.2
Colombia	68	400.0	389.9	410.7
Costa Rica	67	401.4	391.7	411.1
Croatia	43	462.6	458.5	466.7
Czech Republic	11	515.7	514.7	516.7
Denmark	21	497.3	494.0	500.5
Dominican R..	80	327.7	329.0	326.4
Estonia	8	523.5	520.0	527.0
Finland	14	507.5	510.6	504.5
France	35	487.0	485.0	489.0
Georgia	69	399.6	401.5	397.8

This table presents the percentage of cases where each gender outperformed the other across the selected domain. Also, hovering over the percentage reveals the list of countries where that gender had the performance advantage and its share of the total.

This table lists countries with their rank and average scores by gender in the selected domain, allowing for direct performance comparison. Defined metrics (see boxes Ref. 4) support more effective comparisons across individual scores or values (Rank, Avg. of the current table).

Clicking a country on the map highlights the corresponding row in the table above in yellow, allowing users to easily connect geographic and numerical data.

1 Domain Parameter



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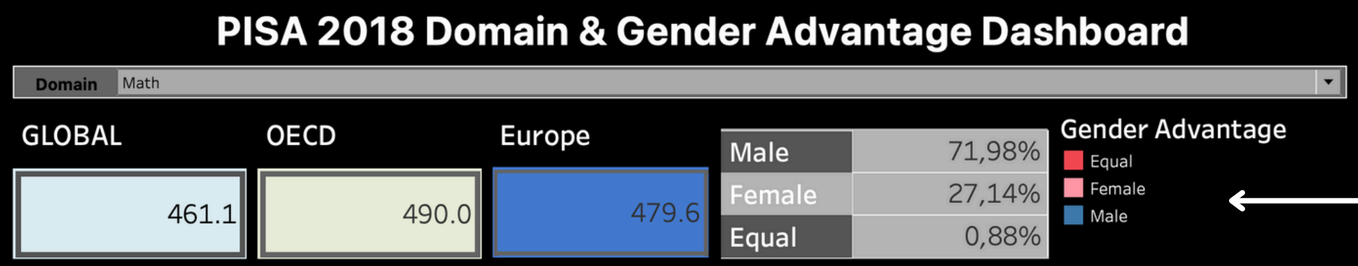
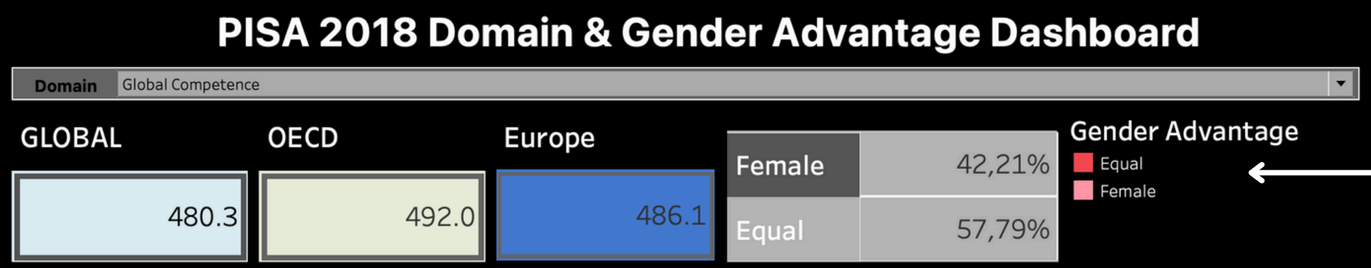
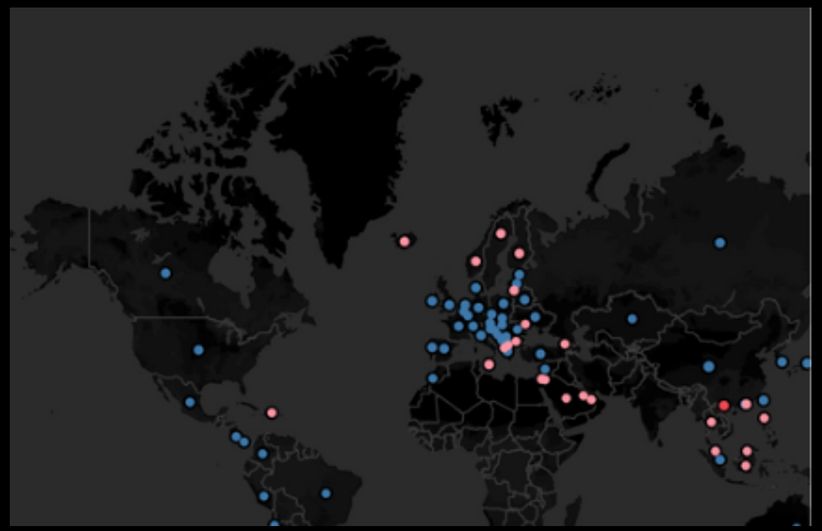
Georgia	69	399.6	401.5	397.8

Selects the domain area—Math, Reading, Science, All including all the aforementioned ones and Global Competence —to update all dashboard elements accordingly (e.g., maps, scores, rankings, and gender gaps). It has global scope.

2 Gender Advantage

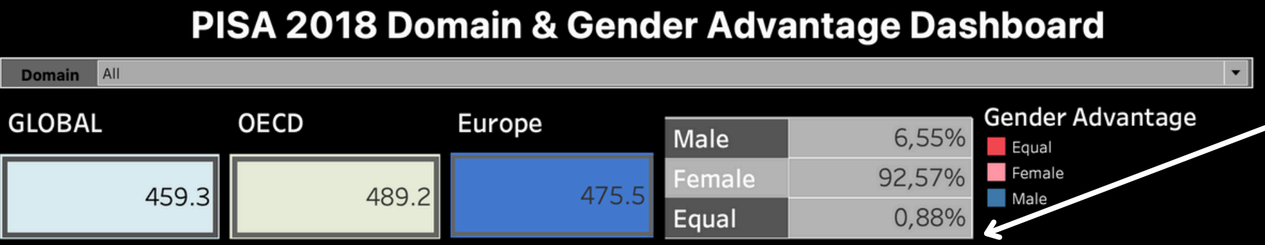






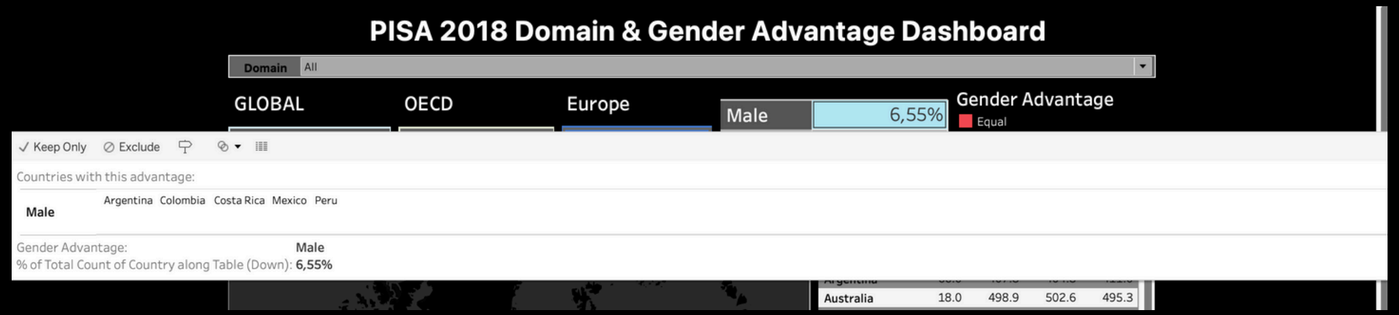
- This legend indicates which gender outperforms the other in the selected domain. More specifically, **red** means equal advantage, **pink** female advantage and **blue** male advantage.
- For example, if the user selects Global Competence as the parameter, only **red** and **pink** indicators appear—signaling that males do not hold a performance advantage in any country.
- These colors also appear on the map, indicating the gender advantage for each country based on the selected domain.

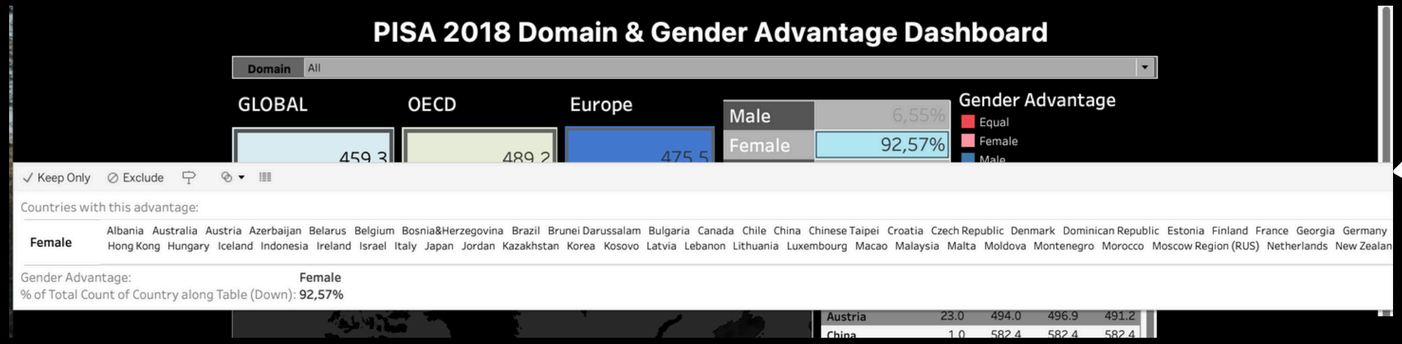
3 Gender Advantage Percentages and Hover



Overview of gender advantage percentages across the selected domain (“All”).
Male: 6.55%, Female: 92.57%, Equal: 0.88%
This summary shows how often each gender outperformed the other globally.

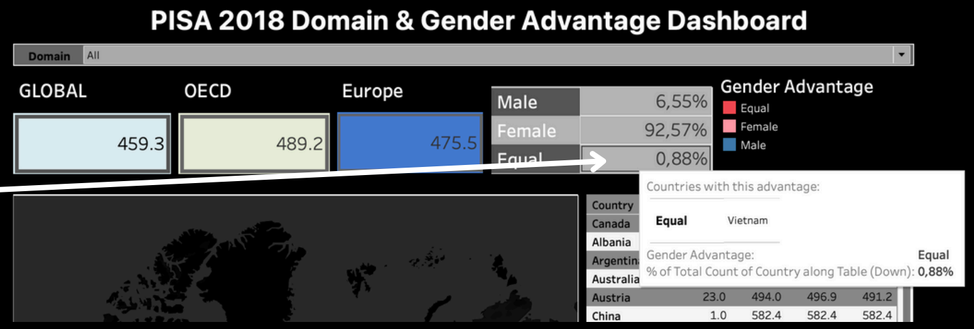
Hover tooltip for Male advantage:
Displays the list of countries (e.g. Argentina, Colombia) where males had a performance advantage and shows their proportional share (6.55%).



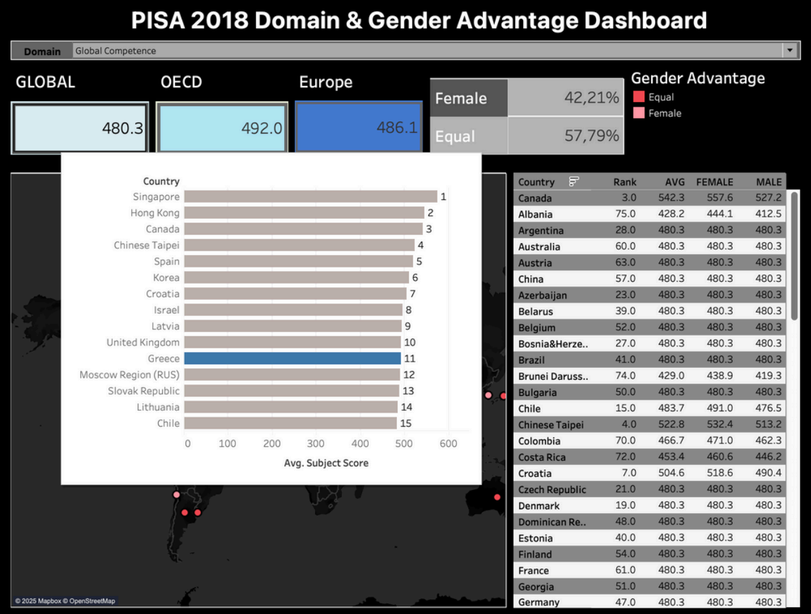


Hover tooltip for Female advantage:
Reveals the full list of countries where females had the advantage, along with their percentage of the total (92.57%).
This confirms that female outperformance dominates across domains.

Hover tooltip for Equal advantage:
Shows the rare case where no significant gender difference was found.
In this view, only one or two countries (e.g. China, Albania, Vietnam) are listed under “Equal,” representing just 0.88%.

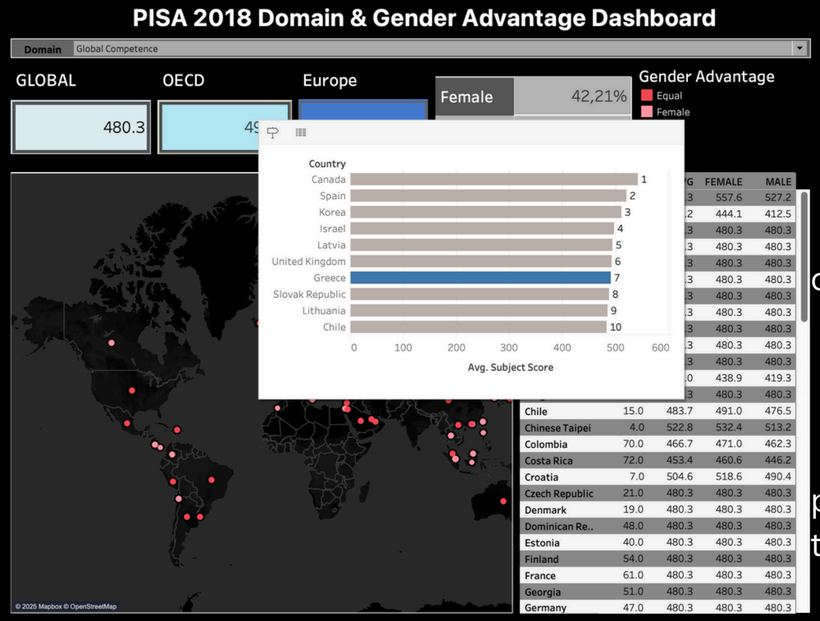


4 Domain Scores Across Global, OECD, and European Groups

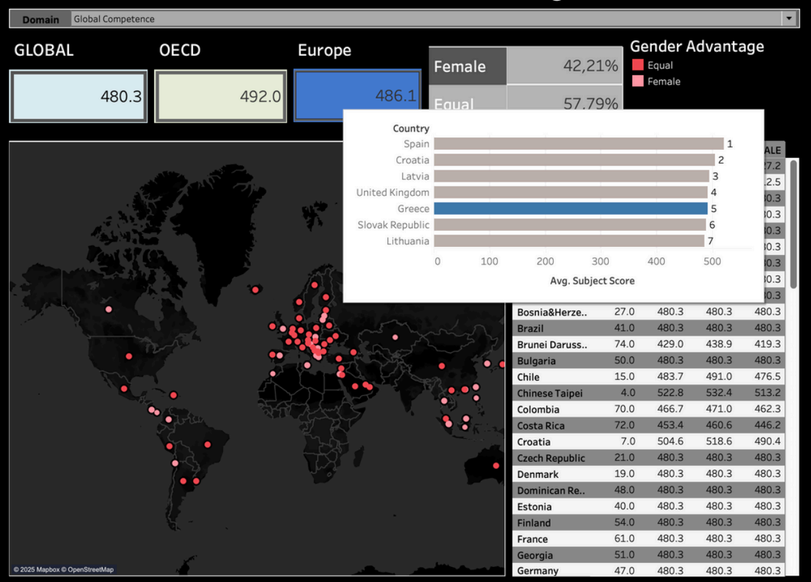


Country	Rank	AVG	FEMALE	MALE
Canada	3.0	542.3	557.6	527.2
Albania	75.0	428.2	444.1	412.5
Argentina	28.0	480.3	480.3	480.3
Australia	60.0	480.3	480.3	480.3
Austria	63.0	480.3	480.3	480.3
China	57.0	480.3	480.3	480.3
Azerbaijan	23.0	480.3	480.3	480.3
Belarus	39.0	480.3	480.3	480.3
Belgium	52.0	480.3	480.3	480.3
Bosnia&Herze..	27.0	480.3	480.3	480.3
Brazil	41.0	480.3	480.3	480.3
Brunei Daruss..	74.0	429.0	438.9	419.3
Bulgaria	50.0	480.3	480.3	480.3
Chile	15.0	483.7	491.0	476.5
Chinese Taipei	4.0	522.8	532.4	513.2
Colombia	70.0	466.7	471.0	462.3
Costa Rica	72.0	453.4	460.6	446.2
Croatia	7.0	504.6	518.6	490.4
Czech Republic	21.0	480.3	480.3	480.3
Denmark	19.0	480.3	480.3	480.3
Dominican Re..	48.0	480.3	480.3	480.3
Estonia	40.0	480.3	480.3	480.3
Finland	54.0	480.3	480.3	480.3
France	61.0	480.3	480.3	480.3
Georgia	51.0	480.3	480.3	480.3
Germany	47.0	480.3	480.3	480.3

- The first box displays the average score for the Global group in the selected domain.
  - We selected Global Competence (GLCM) to demonstrate Greece's highlight in **blue**, which does not appear in subject domains due to its lower performance there.
- Hovering reveals a ranking of countries by average performance worldwide.
- Greece (**blue**) ranks 11th, performing above the global average but behind top global performers.
- This view provides a broad international benchmark.



- The middle box shows the average score for OECD countries, representing economically similar peers.
  - Hovering displays rankings within this group based on the selected domain.
  - Greece (**blue**) appears in the top tier, reflecting stronger performance in Global Competence compared to traditional subjects.
  - This view allows for peer-level benchmarking.



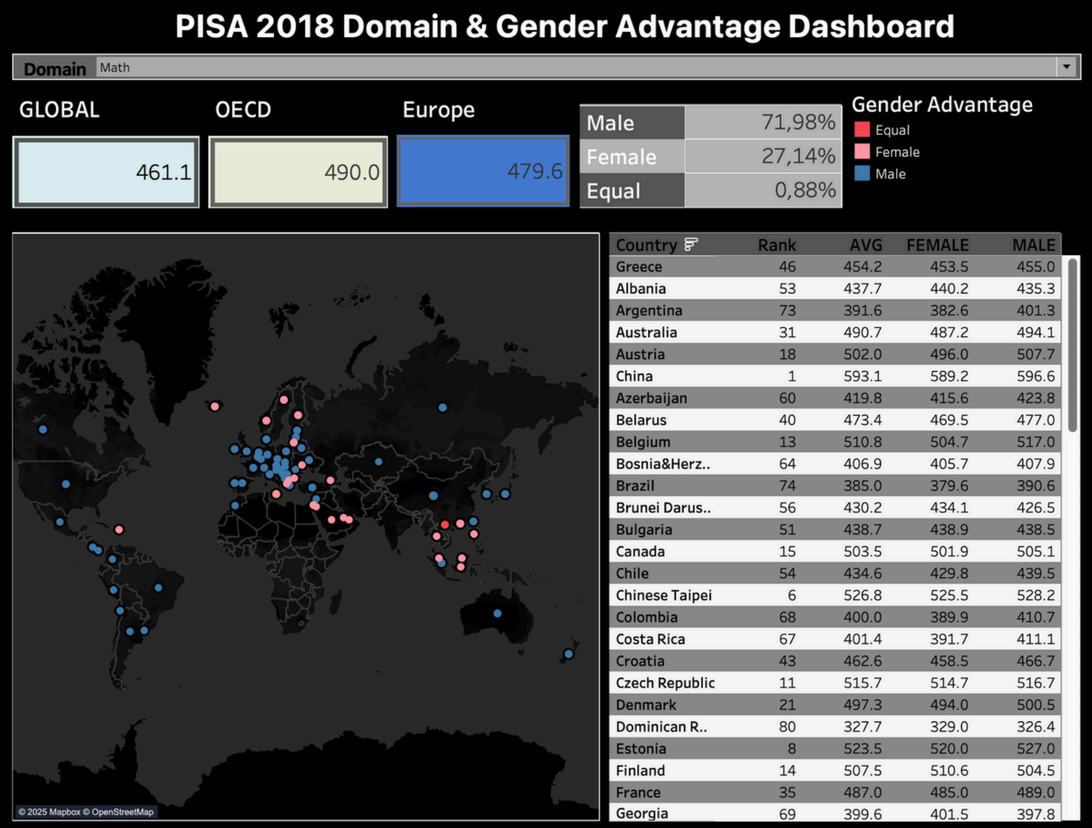
Country	Rank	AVG	FEMALE	MALE
Bosnia&Herze..	27.0	480.3	480.3	480.3
Brazil	41.0	480.3	480.3	480.3
Brunei Daruss..	74.0	429.0	438.9	419.3
Bulgaria	50.0	480.3	480.3	480.3
Chile	15.0	483.7	491.0	476.5
Chinese Taipei	4.0	522.8	532.4	513.2
Colombia	70.0	466.7	471.0	462.3
Costa Rica	72.0	453.4	460.6	446.2
Croatia	7.0	504.6	518.6	490.4
Czech Republic	21.0	480.3	480.3	480.3
Denmark	19.0	480.3	480.3	480.3
Dominican Re..	48.0	480.3	480.3	480.3
Estonia	40.0	480.3	480.3	480.3
Finland	54.0	480.3	480.3	480.3
France	61.0	480.3	480.3	480.3
Georgia	51.0	480.3	480.3	480.3
Germany	47.0	480.3	480.3	480.3

- The third box presents the average score for European countries in the selected domain.
- Hovering highlights rankings among European and Eastern European countries, including Greece.
- Greece (**blue**) is again among the top performers, showing its strength relative to regional neighbors.
- This view offers a geographic and cultural performance context.

Note 1st : On the x-axis, users see the average score for each domain, with the corresponding rank displayed at the end of each bar.

Note 2nd : By default, hovering displays up to the top 15 countries based on the selected criteria. If fewer than 15 are available, all matching countries are shown.

5 6 7 MAP & Table Interaction



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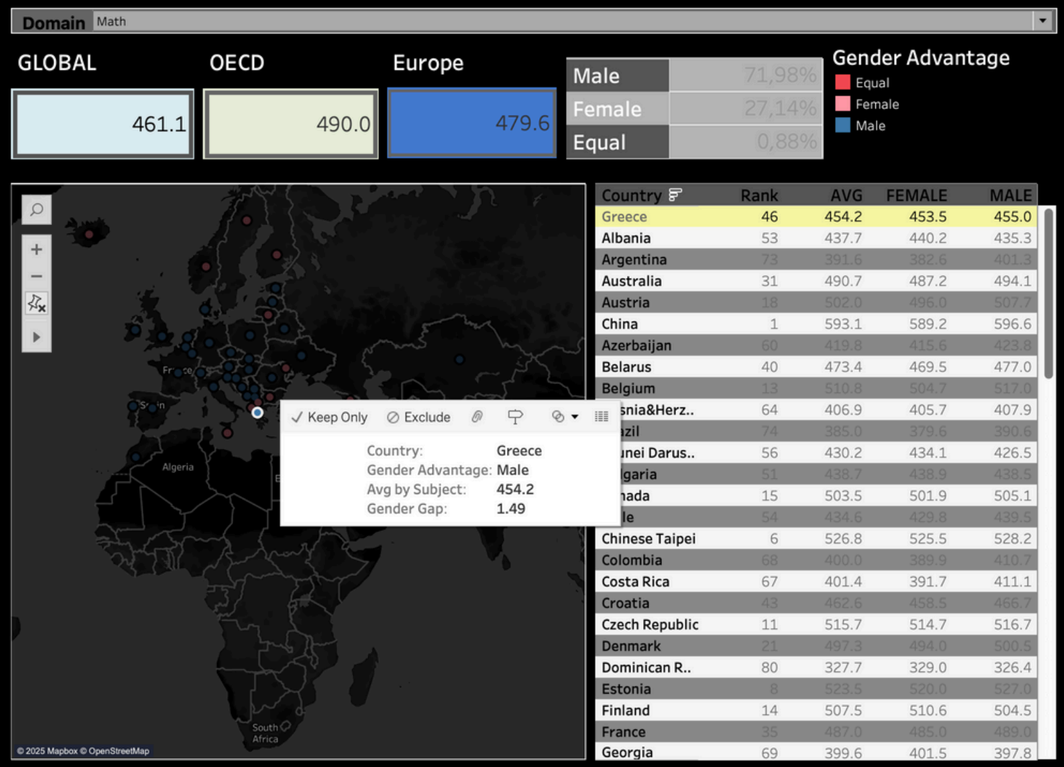
Georgia	69	399.6	401.5	397.8

- The map displays gender advantage by country, using pink (female), blue (male), and gray (equal). Greece is shown in blue, indicating male advantage in the selected domain (Math).
- The accompanying table presents detailed metrics (AVG, AVG FEMALE, AVG MALE scores for the selected domain) and the rank (both genders).
- This allows direct comparison across countries, and highlights Greece's lower rank (46) with a small gender gap of 1.49.



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- Hovering over Greece reveals a tooltip showing the gender advantage, average subject score, and gender gap—offering instant insight without leaving the map.
- Clicking on Greece in the map automatically highlights its corresponding row in yellow in the table above, helping users clearly associate spatial and numerical data.

Summary

GREECE POSITION

- Greece ranks below the global, OECD and Europe averages in academic subjects, as shown by domain-level KPIs.
- Greece ranks 46th in Mathematics, 45th in Reading, 48th in Science, and 47th overall across all domains..
- In contrast, hovering on the KPIs, Greece performs above the global (**11th** place), OECD averages(7th) and Europe averages (5th) in Global Competence.
- This contrast highlights Greece's relative strength in Global Competence, despite lower performance in core subjects.

♂ GENDER GAP ♀

- From the table close to map, we can understand that, girls in Greece outperform boys in all subjects, with the largest gaps in Reading and Global Competence, as visualized in map and table.
- From gender advantage table, we can understand that, globally, females hold a gender advantage in all domains except Math, where the gap is smaller or occasionally favors males.

If you find this project helpful, please consider starring it on GitHub ★
https://github.com/e-panourgia/vizRTableau, authored by e-panourgia

Data Acknowledgments: OECD
https://www.oecd.org/en/data/datasets/pisa-2018-database.html

Thank you for your time! 😁