Cross-national and cross-contextual analysis: controlling for sample composition and survey characteristics in comparative analysis

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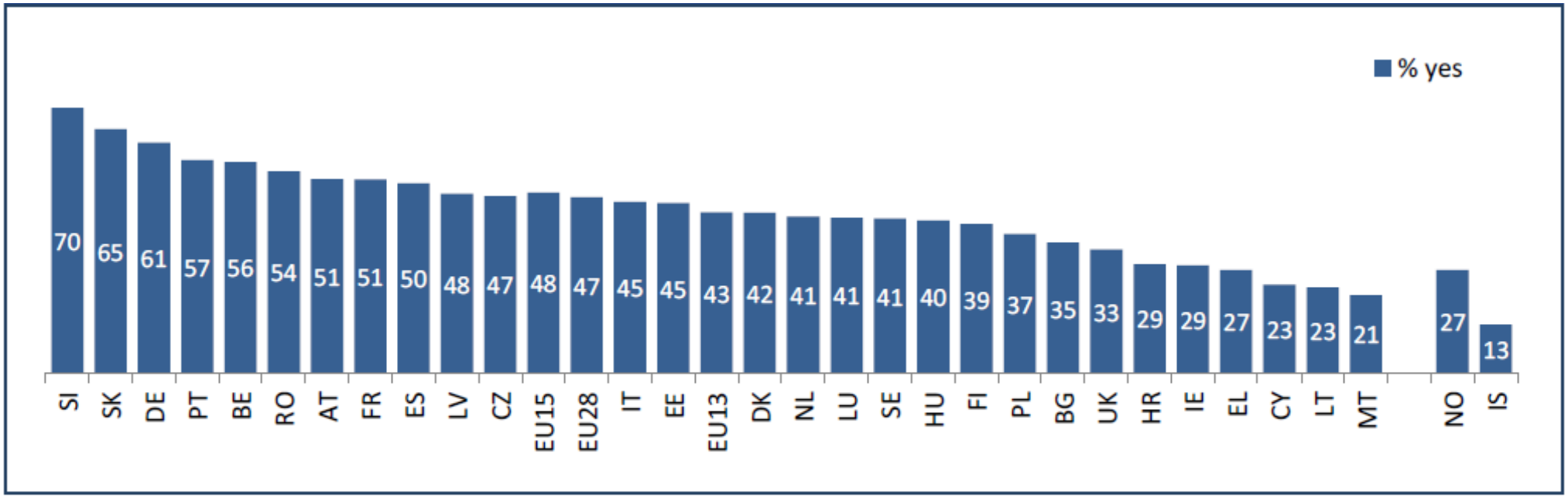
Cross-country and cross-contextual comparisons

Example: Information provision about legal guarantess



Q13. Thinking of the last time you purchased a product with a commercial guarantee, was any information provided to you about the existence of a legal guarantee?

Country differences in survey outcomes are not only caused by **context effects**, but also by **composition effects**.

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Example 1:
Cross-country dual frame telephone survey

Potential causes of composition effects:

- Fieldwork teams applying different call scheduling (e.g. not enough evening calls for landline numbers leading to an underrepresentation of young people)
- Differences across countries in mobile phone usage/mobile phone "etiquette" (e.g. likelihood to answer when contacted by an unknown number, participating in a survey when in a public place etc.)

Example 2:
Cross-country online survey (access panels)

Potential causes of composition effects:

Differential coverage

Differences in selection bias

- Not being able to use the same panel provider across countries; differences in recruitment strategies, differences in quality procedures etc.
- Differences across countries in internet use ("webographics")

Cross-country and cross-contextual comparisons

- Controlling for composition effects is typically done by adding a small set of control variables, together with a set as predictor variables, in an ordinary (OLS) regression model
- An alternative method to compare survey outcomes across countries, while controlling for composition effects, is by using propensity score methods.
- What makes propensity score analysis appealing?
  - the propensity score model is estimated first, and thus independently from the final analysis model
  - allows researchers to include many control variables for more sources of composition effects (propensity score model can be complex with multiple interactions and higher order terms)

Our examples

Variables to be included in propensity score model

Cross-country dual frame telephone survey

- Demographic variables (age, activity status etc.)
- Variables explaining mobile phone usage

Cross-country online survey (access panels)

- Demographic variables (age, level of education etc.)
- Variables explaining differences in internet usage ("webographics")

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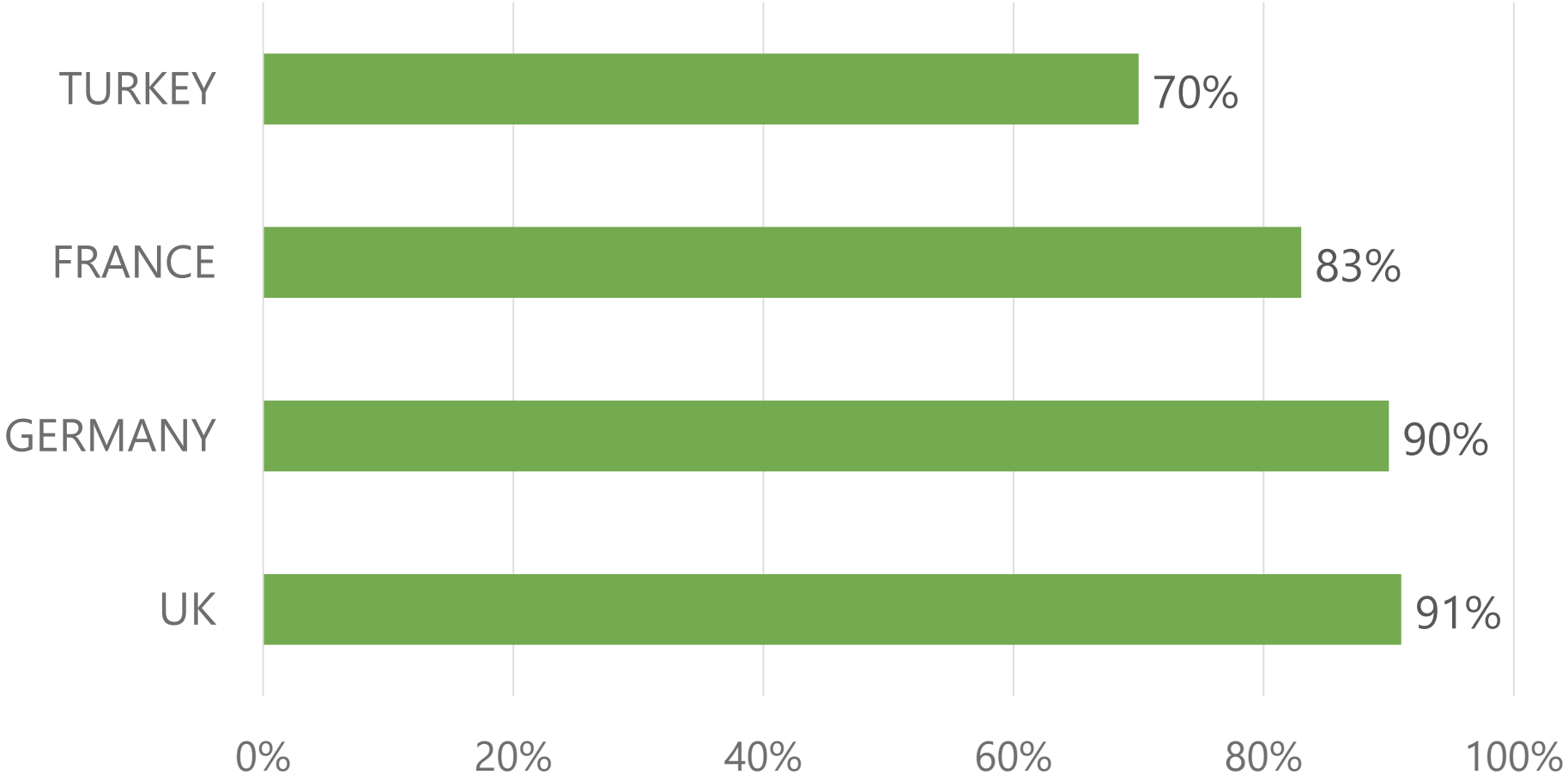
Data: Global @dvisor

- Ipsos online panels
- conducted every month in 20+ countries
- approximately 1,000 respondents in each country
- weights are provided to balance demographics to reflect the adult populations

- This example focuses on four countries with different Internet penetration: France, Germany, Turkey and the UK

Differences in coverage

% of HH with internet access, Eurostat



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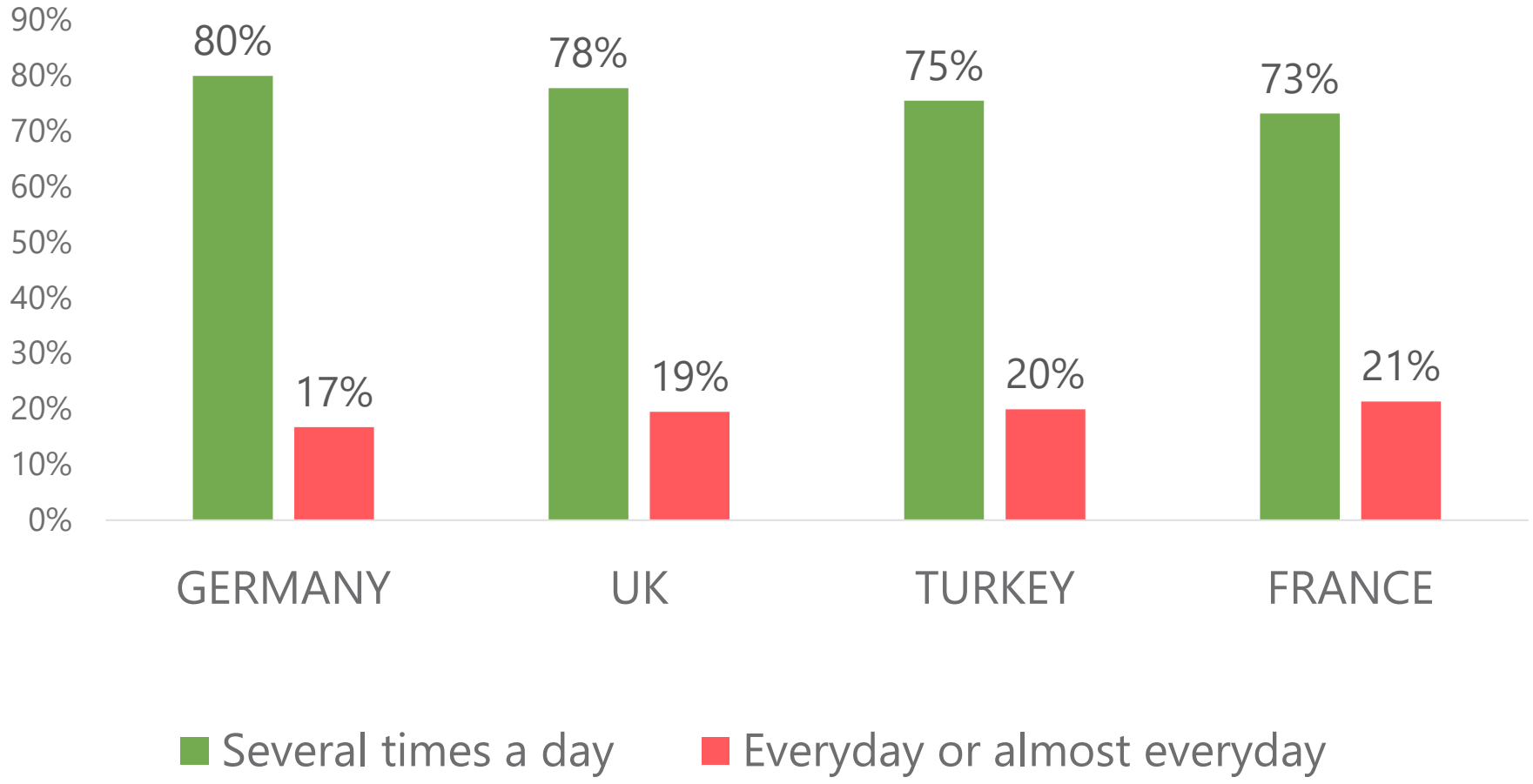
Differences in internet use

Frequency of internet use, Global @dvisor



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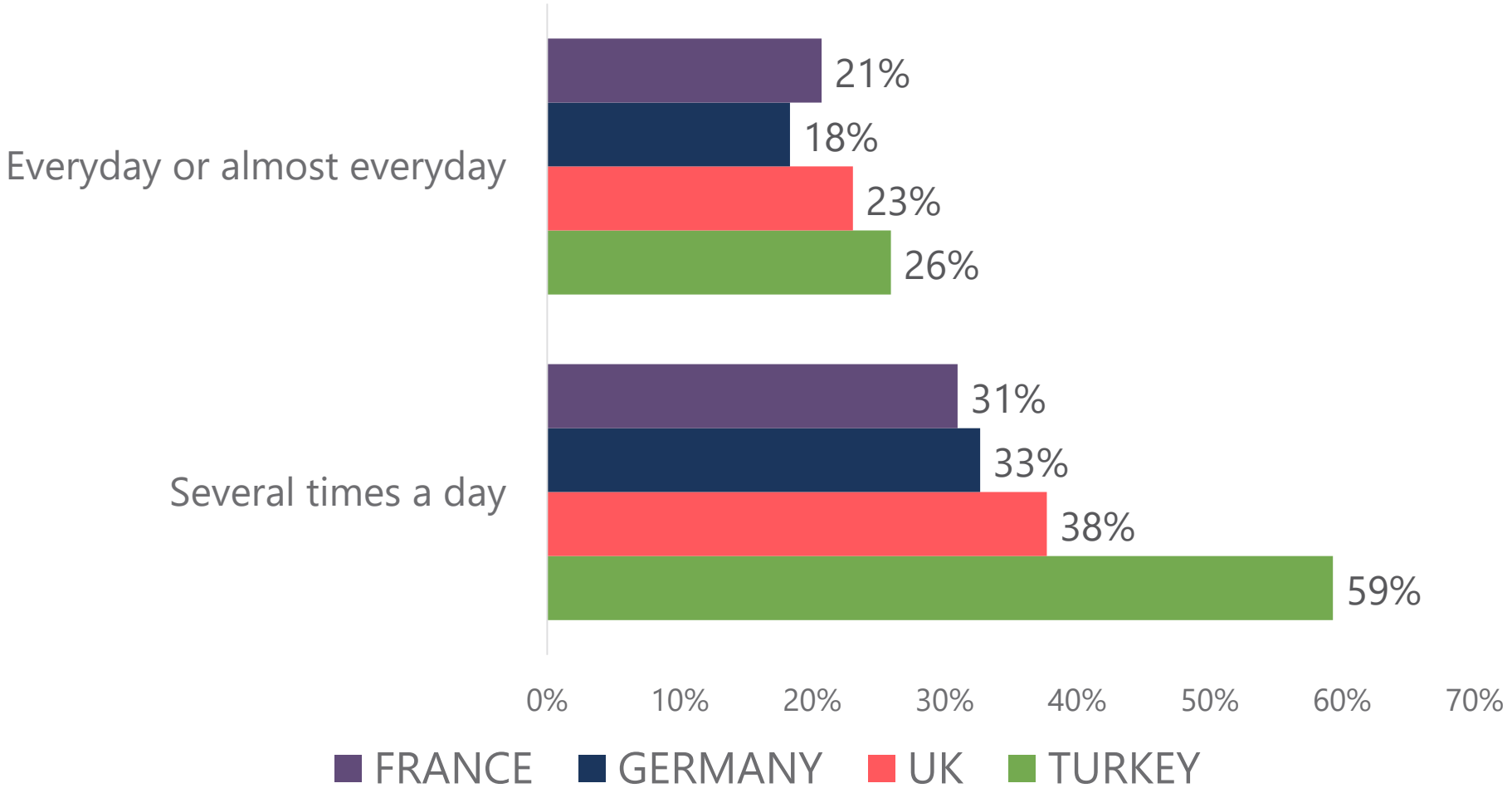
Differences in internet use

Visiting social network websites, Global @dvisor



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Propensity scores for multiple treatments

The `mnps` function in `twang` package

- `mnps` is part of the Toolkit for Weighting and Analysis of Nonequivalent Groups (`twang`) written by Burgette, Griffin & McCaffrey (April, 2016)
- Extends propensity score matching to more than two groups.
- `twang` methods rely on tree-based regression models that are built in an iterative fashion.
- Estimates propensity score for multiple groups (treatments) with interactions.
- `Mnps` provides useful tools (e.g. tables, graphics) to explore group differences.

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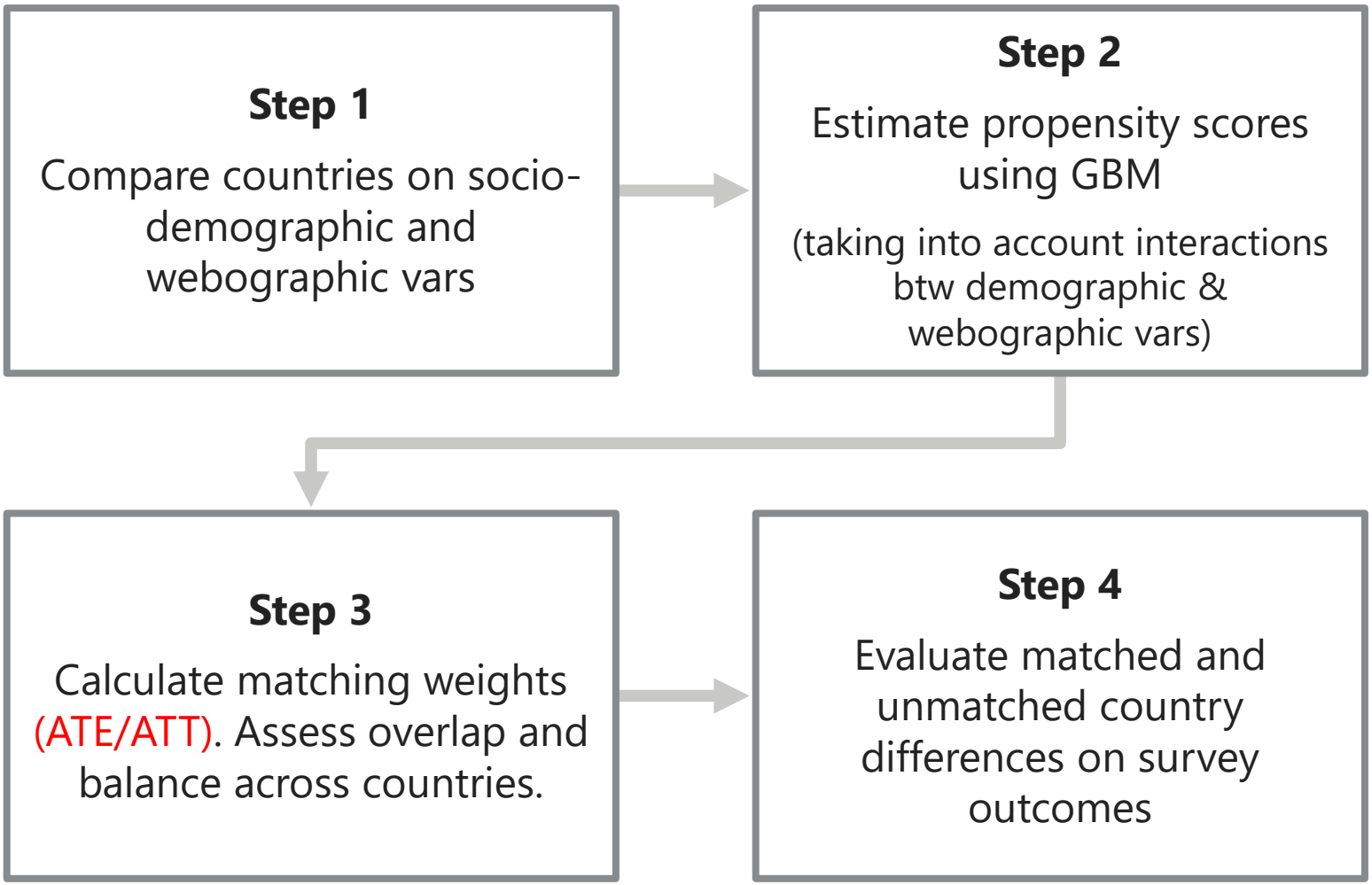
Propensity score matching

Multinomial propensity scores with small set of countries



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Variables used in matching

- Age
- Gender
- Marital status
- University graduate

- Internet use
- Use of social network sites
- Frequency of watching TV
- Frequency of watching online TV
- Frequency of reading printed news source
- Frequency or reading news online
- Frequency of using Twitter

main effects
+ interactions

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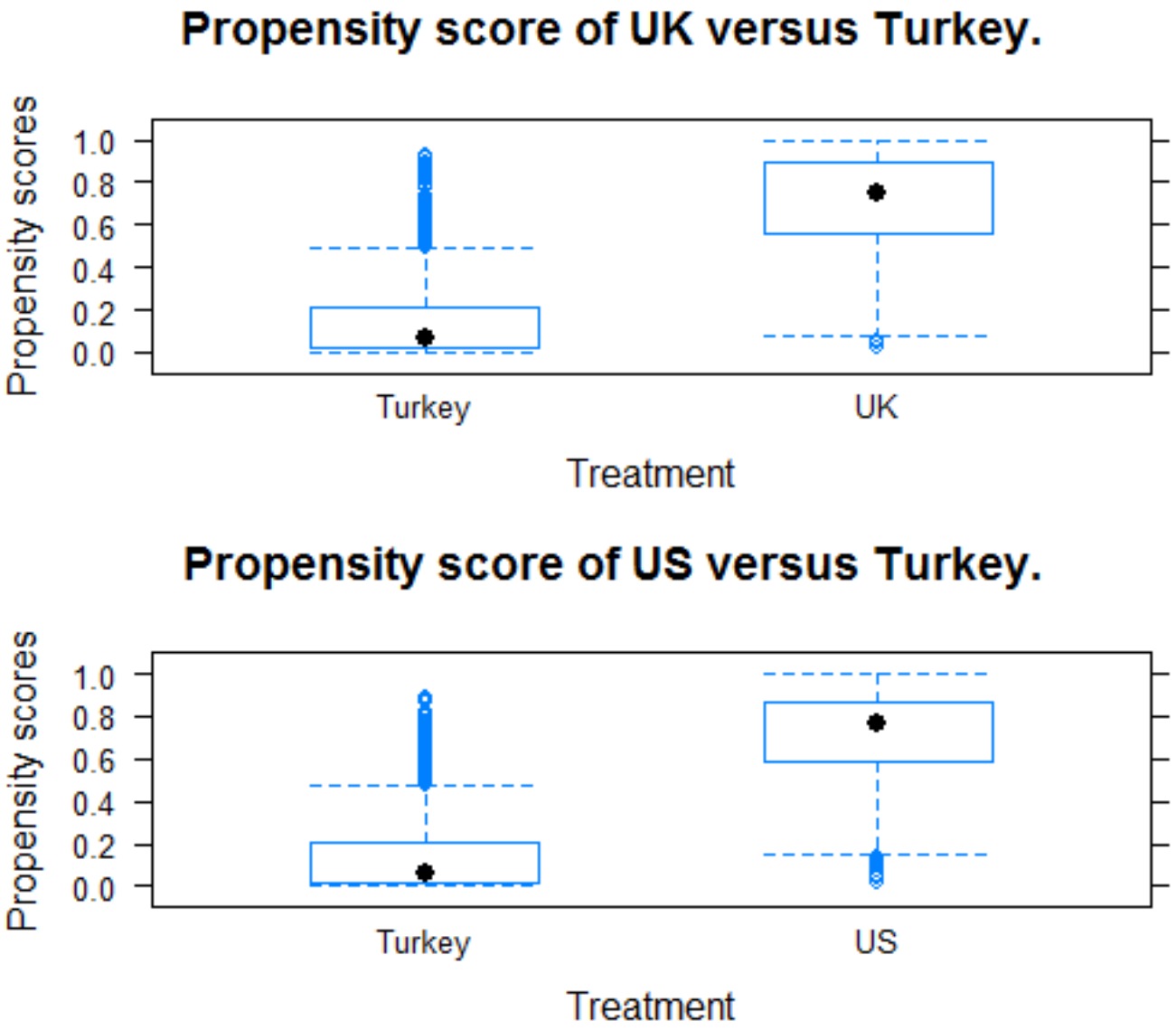
Case study 1:
comparisons across low/high internet penetration countries

Propensity score distributions



- There is not enough overlap between the countries in terms of socio-demographic and webographic vars.
- Turkey data set is used as reference in matching (ATT).
- Inference on country differences is limited to a subpopulation that matches the Turkish web sample.

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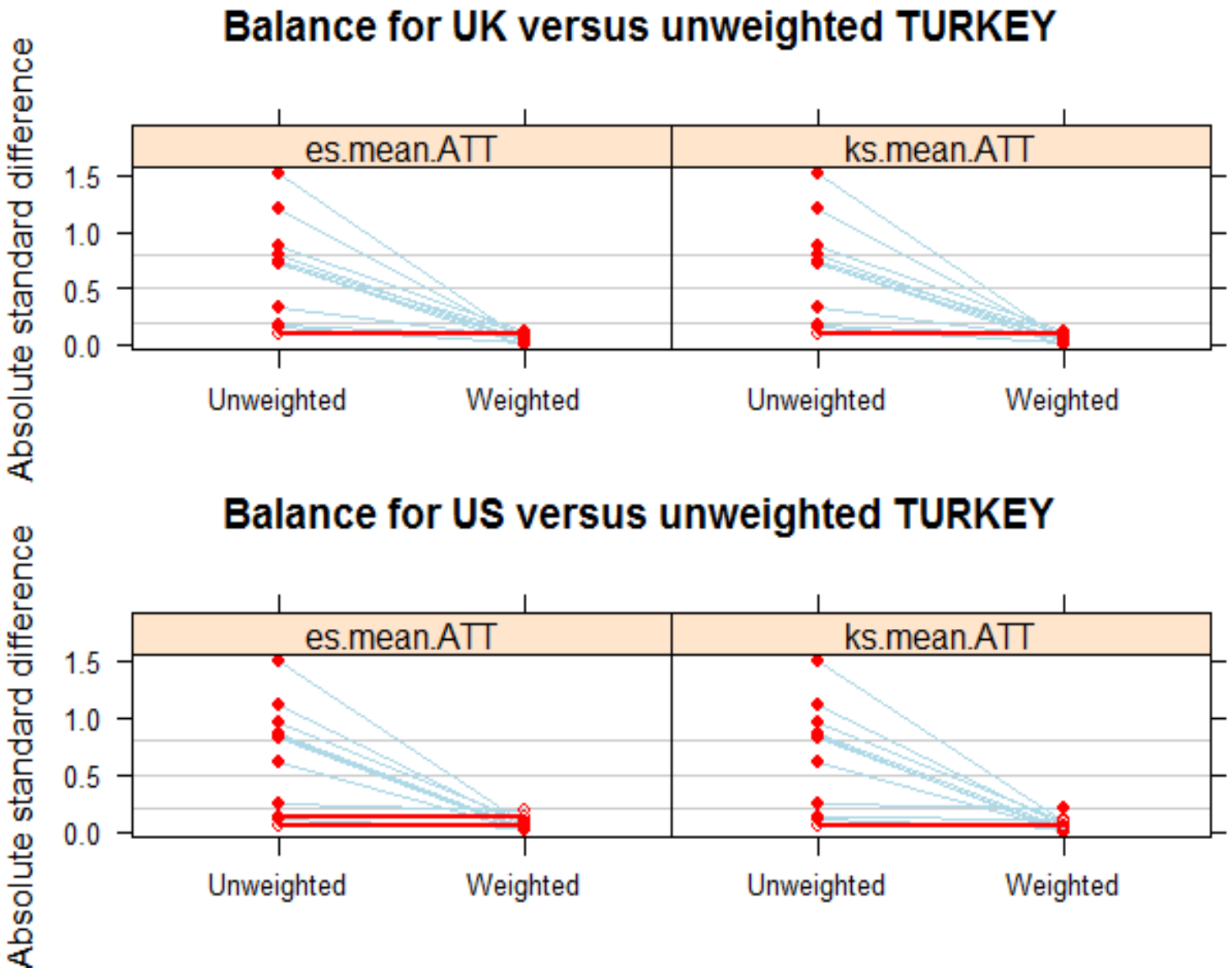
Balance in demographic & webographic variables



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Survey outcomes after matching

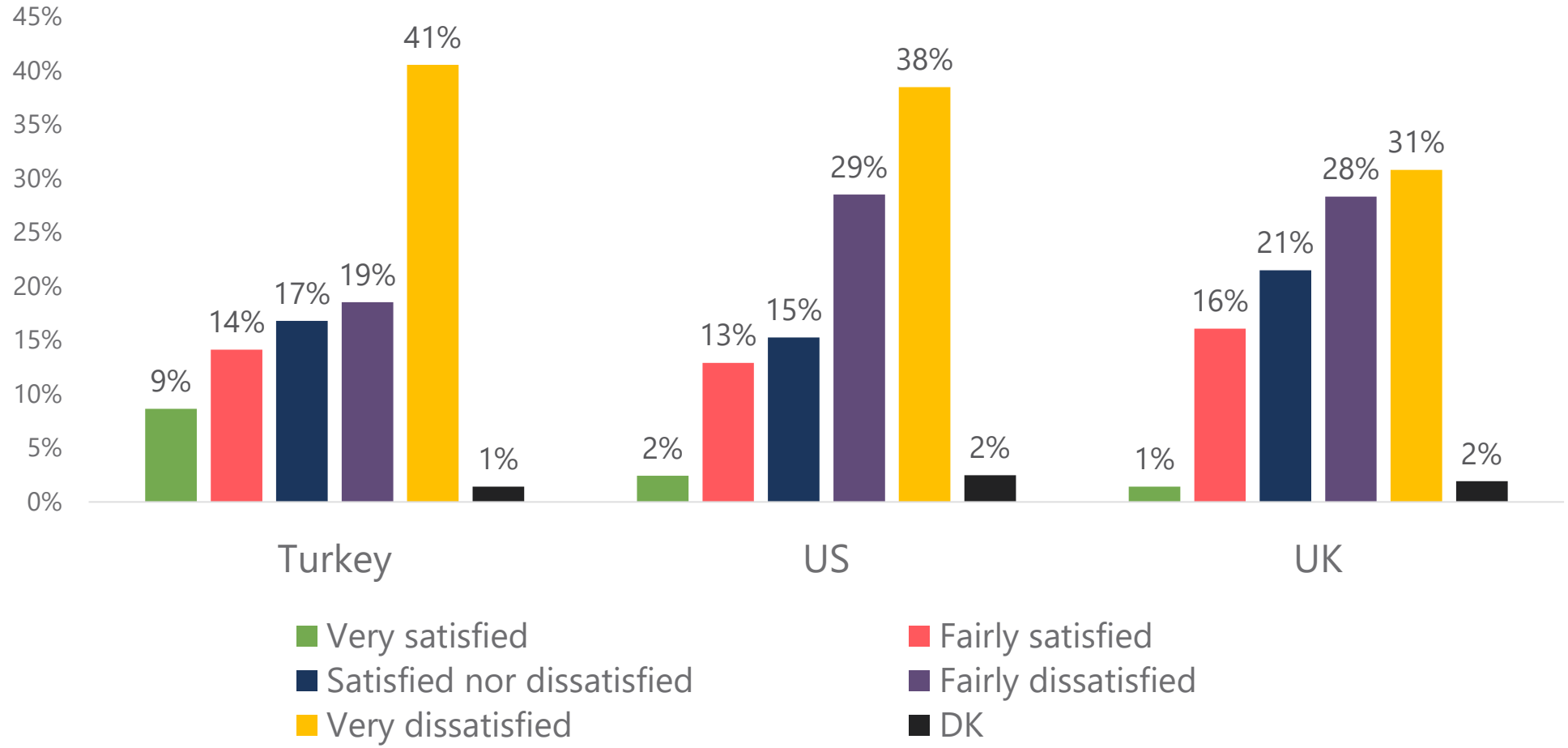
Looked at several survey outcomes.

1. Satisfaction with government
2. Satisfaction with country
3. Rating of the current status of economy
4. Happiness
5. Right direction/wrong track
6. Subjective income

Survey outcomes before and after matching

Unmatched population comparisons, weighted by socio-demographics

The way the government is running the country? Overall, how satisfied or dissatisfied?



Source: Global Advisor 2015

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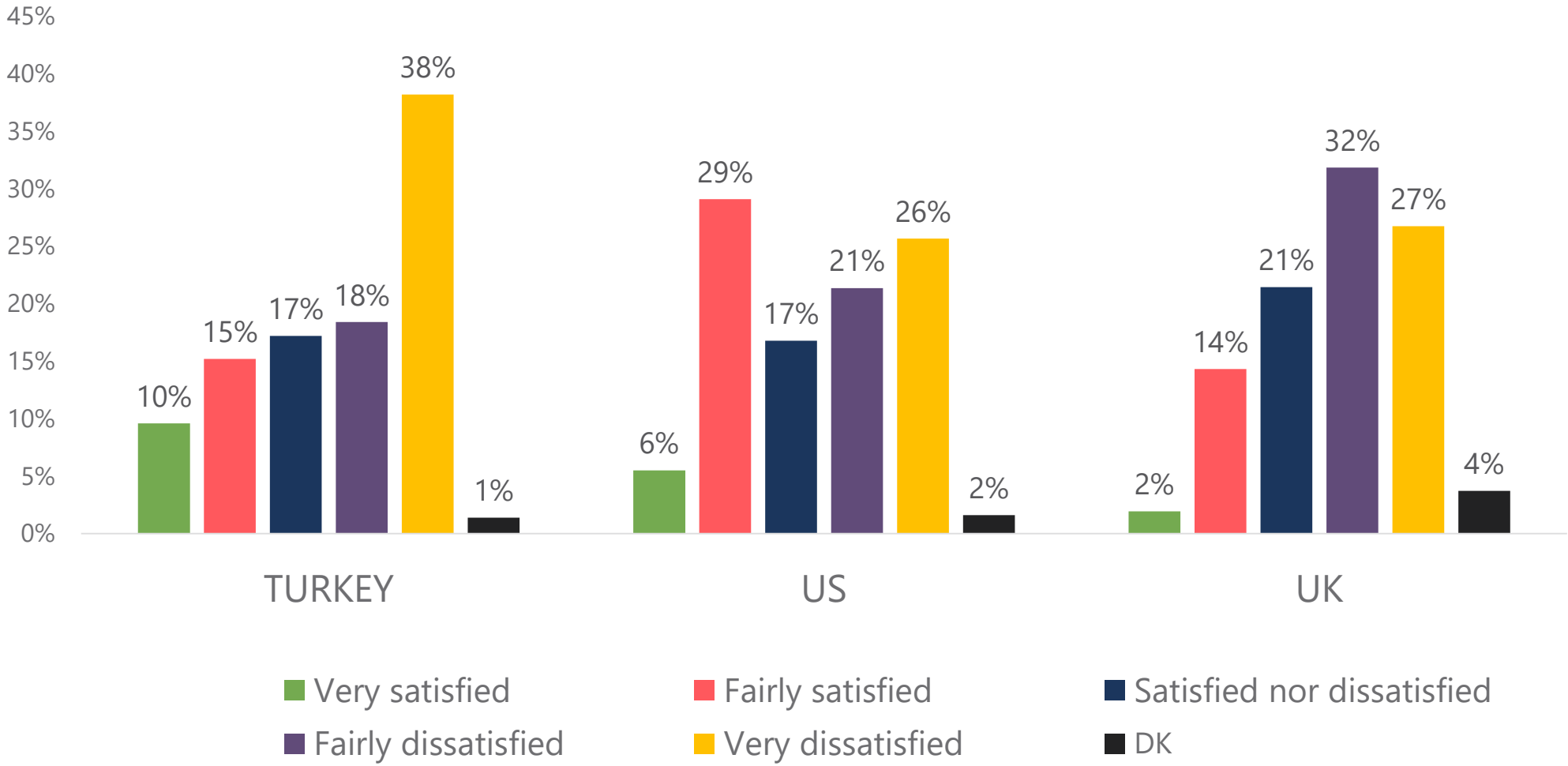
Survey outcomes before and after matching

Matched comparisons, (socio-demographics+ webographics)

The way the government is running the country? Overall, how satisfied or dissatisfied



Source: Global Advisor 2015

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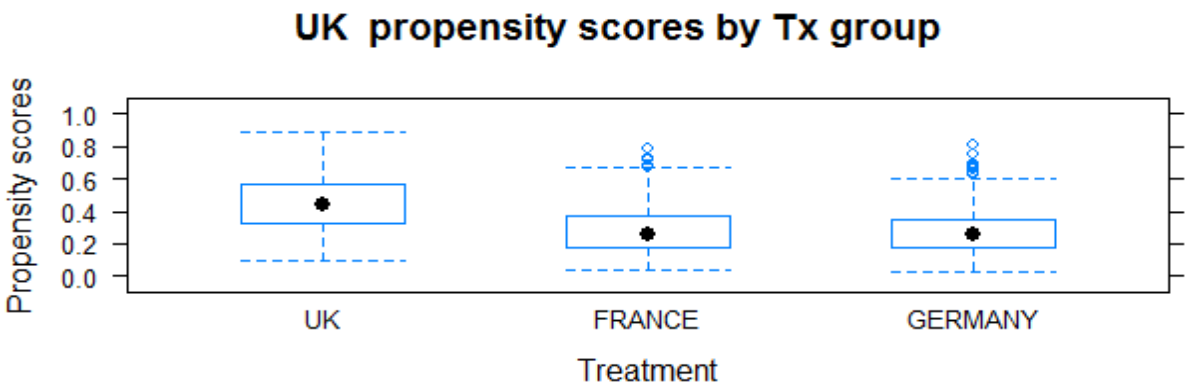
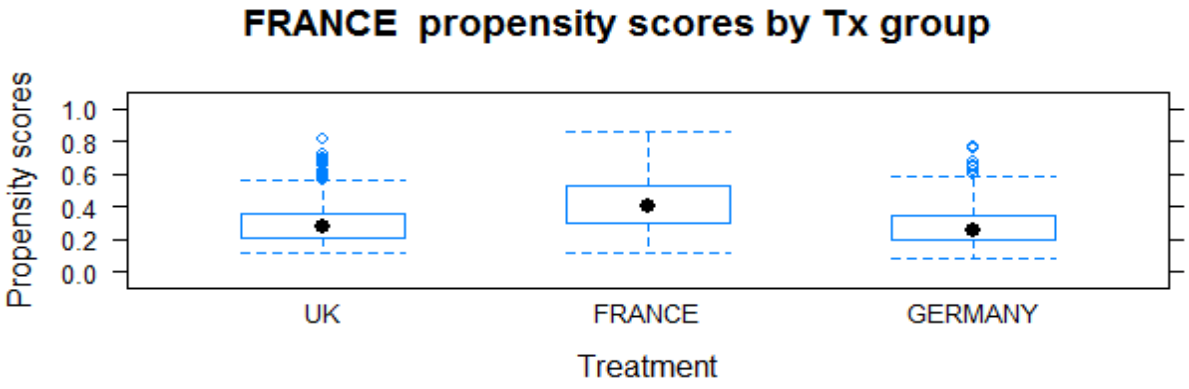
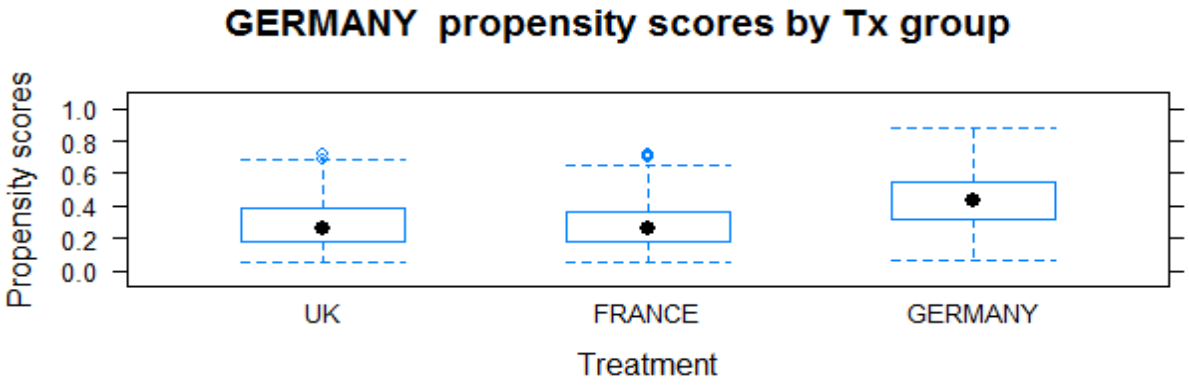
Case study 2: comparisons across high internet penetration countries

Propensity score distributions







- There is enough overlap between the countries in terms of socio-demographic and webographic vars.
- A pseudo-population (population of all countries) used as reference in matching (ATE).
- Inference on country differences refer to the population of all countries combined.

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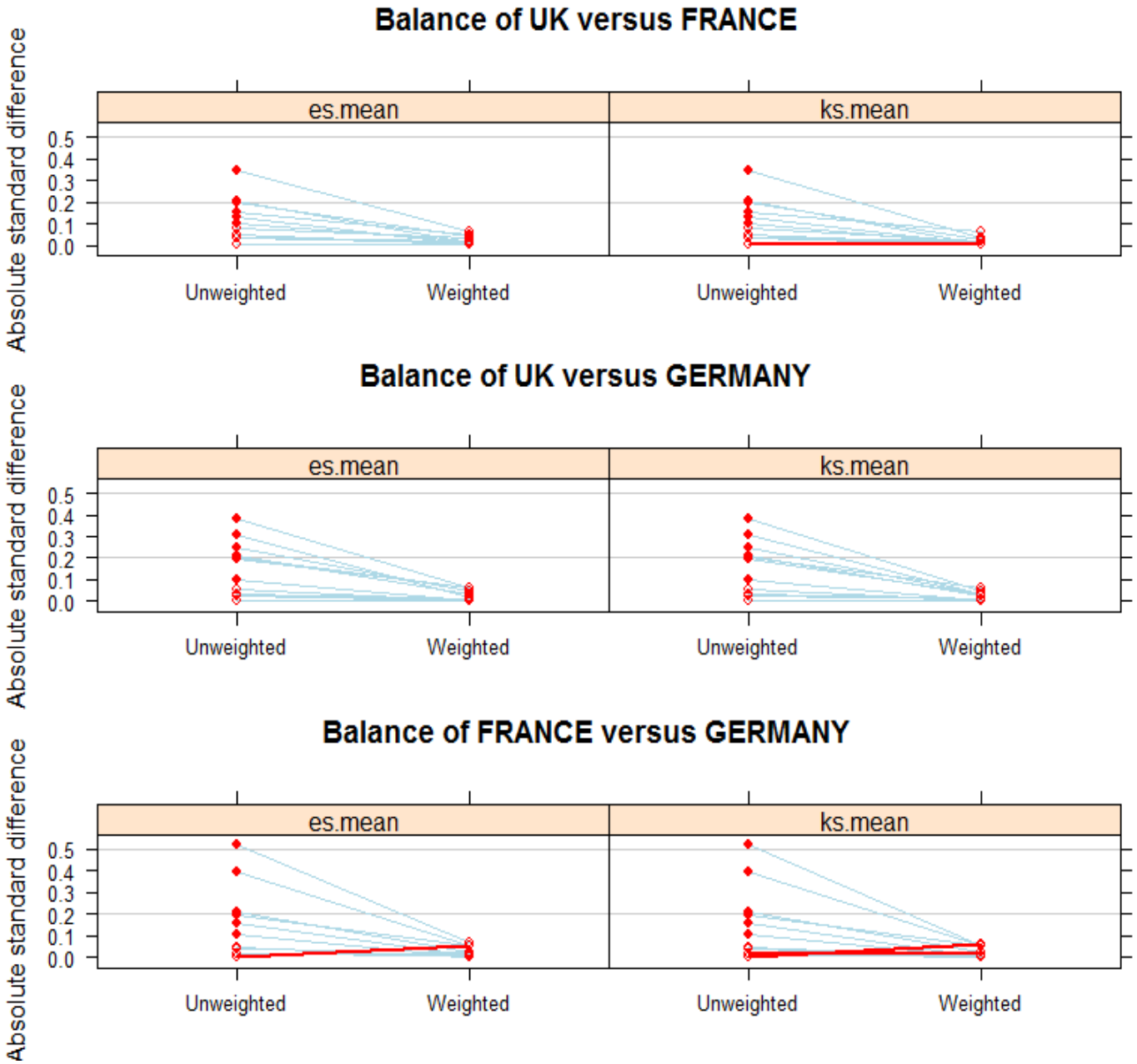
Balance in demographic & webographic variables



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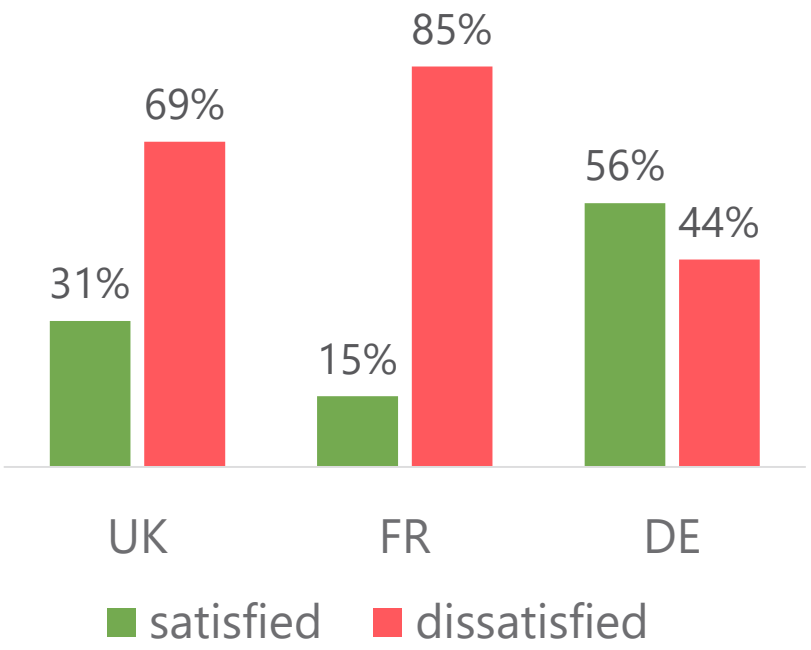
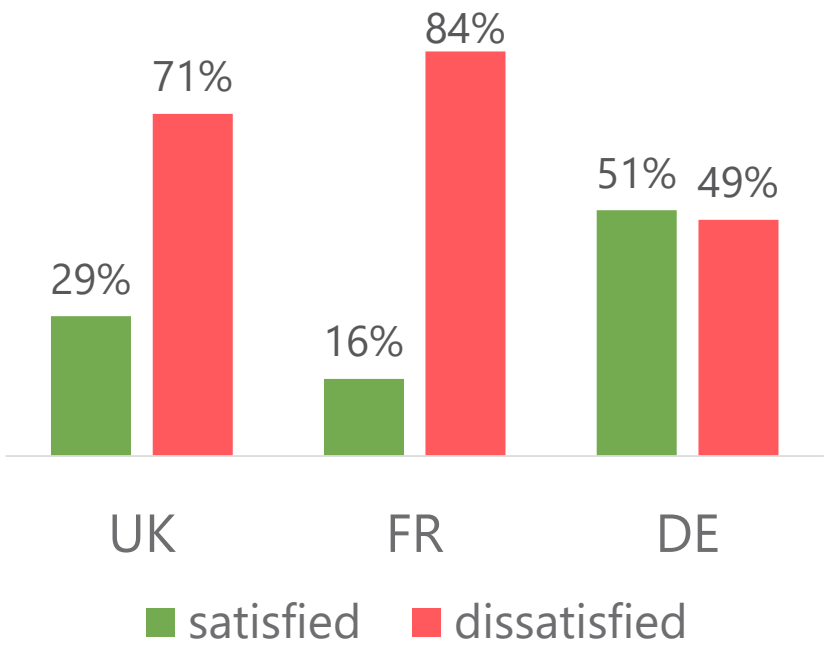
Survey outcomes before and after matching

Now, thinking about your country, overall, are you satisfied or dissatisfied with the way things are going in your country today?

Unmatched comparisons, weighted by socio-demographics



Matched comparisons, (socio-demographics+ webographics)



Source: Global Advisor 2015

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Take-home message

- Different types of composition effects confound estimates of cross-country and cross-contextual comparisons.
- In addition to controlling for socio-demographics, “webographics” can be used to assess and adjust differences in survey estimates across countries.
- An effective way to compare contexts is be using multinomial matching (note: comparison limited to a few countries).
- “Inference populations” need to be discussed while presenting results, especially when overlap between populations is low.
- Main problem remains the selection of variables to be included in the multinomial matching (what really explains the selection/composition effects?)

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