



A Climate-Fiscal Policy Mix to Achieve Turkiye's Net-Zero Ambition under Feasibility Constraints

PRWP Reproducibility Verification Report

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This review verifies the reproducibility of the exhibits included in the paper “*A Climate-Fiscal Policy Mix to Achieve Turkiye's Net-Zero Ambition under Feasibility Constraints*”.

Contents in this review:

1. Main findings
2. Reproducibility assessment
3. List of exhibits and reproducibility status

Main findings

- The code was executed on a clean setup after installing both Dynare and Matlab's Optimization tool-box.
- Full reproducibility of the paper's exhibits was achieved using this reproducibility package. For a detailed analysis, refer to sections Reproducibility assessment and List of exhibits and reproducibility status.
- The package takes approximately 90 hours to run.
- We were unable to assess the package's stability due to the lengthy duration of the process. Note that since the script utilizes quasi-random methods, certain calculations can differ from one run to another. Consult the README file for more information on the stability of the process.

Reproducibility assessment

Paper exhibits were attempted to be reproduced in a computer with the following specifications:

- OS: Windows 10 Enterprise, version 21H2
- Processor: Intel(R) Xeon(R) Gold 6226R CPU @ 2.90GHz
- Memory available: 32 GB
- Software version: Matlab R2023a, Dynare 5.4

We utilized the paper “*A Climate-Fiscal Policy Mix to Achieve Turkiye's Net-Zero Ambition under Feasibility Constraints*” in its PDF format from the reproducibility package provided by the authors. We then compared the code results with the exhibits in the paper to ascertain their reproducibility.

- We observed discrepancies in certain figures. However, the team ensured the inclusion of a seed where applicable and clarified in the README the potential reasons for these differences. This is mainly attributed to the inherent randomness of their simulations.
- Upon considering the minor variations stemming from the randomness of the Monte-Carlo simulations, we affirm that the paper is reproducible using the provided reproducibility package.

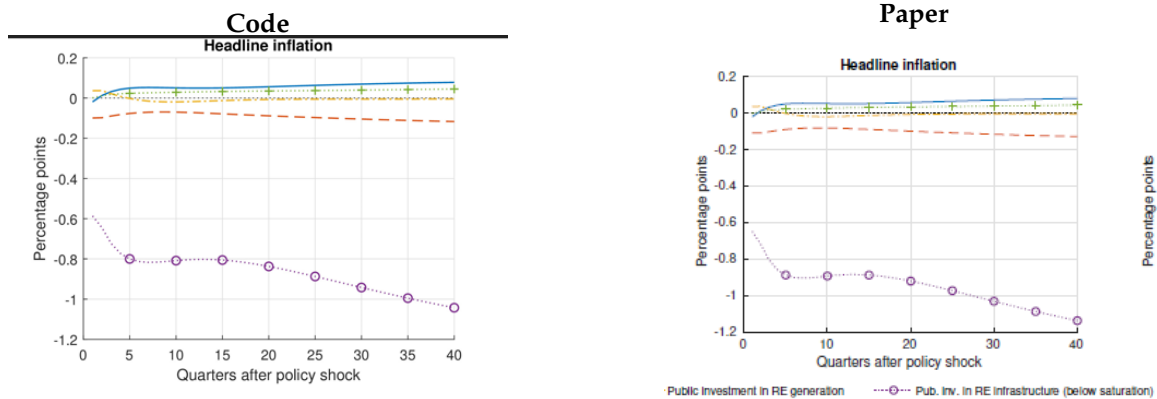
List of exhibits and reproducibility status

Results in the Main Section of the Paper

- **Figure 1** Does not apply: the exhibit does not show analysis results
- **Figure 2** Reproduced

Figure 3 Reproduced with some differences

- **Figure 3a Reproduced with scale differences.** The paper's x-axis uses a 10 by 10 scale, in contrast to the code's 5 by 5 scale.
- **Figure 3b Reproduced with scale differences.** The paper's x-axis uses a 10 by 10 scale, in contrast to the code's 5 by 5 scale.
- **Figure 3c Reproduced with nuances:**
 - * The x-axis in the paper employs a 10 by 10 scale, contrasting the code's 5 by 5.
 - * In the **center graph**, while trends align perfectly, the purple circle in 20,25 sits marginally lower in the code-rendered graph.
- **Figure 3d Reproduced with minor deviations:**
 - * For **Headline Inflation** (middle), the purple line in the code's graph consistently plots slightly beneath. See images below.



Given the Monte-Carlo simulation's inherent variability, these differences are anticipated.

Figure 4 Reproduced with some differences.

- **Figure 4a Reproduced with some differences.** The graph produced by the code reveals a minor kink not present in the paper's graph.

- **Figure 4b** Reproduced with some differences. The red transparent shape in the figure from the paper is slightly broader, but the difference is fairly small.
- **Figure 4c** Reproduced
- **Figure 4d** Reproduced with some differences. The red transparent shape in the figure from the paper is slightly broader, but the difference is fairly small, and expected given the nature of the simulations and tools used in the paper. See example image below for reference.

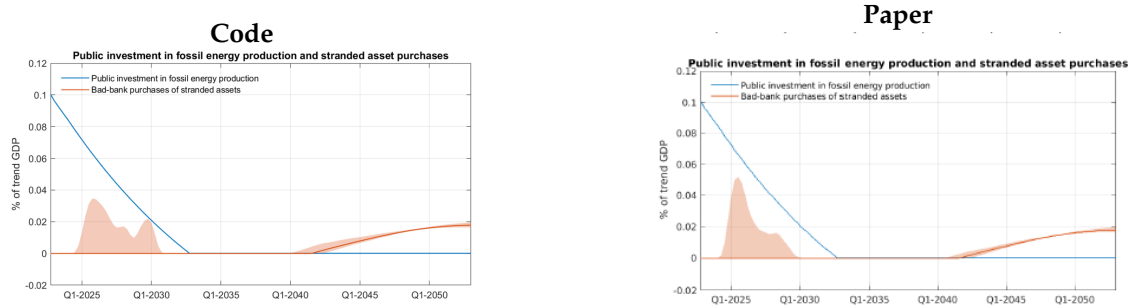


Figure 5 Reproduced with minor differences.

- **Figure 5a** Reproduced with nuances. There is a kink in the green shape area in the paper graph that is not present in the figure produced by the code.
- **Figure 5b** Reproduced

Figure 6 Reproduced with minor differences.

- **Figure 6a** Reproduced with minor differences. The blue area's shape differs very slightly between the paper's graph and the code-produced figure.
- **Figure 6b** Reproduced with minor differences. The red area's shape differs slightly between the paper and the code, but is within the expected range given the environment.
- **Figure 6c** Reproduced with minor differences. Shapes for both the blue and red areas have minor differences.
- **Figure 6d** Reproduced with minor differences. In the paper's figure, the blue line exceeds the 40 range scale, and the code generated graph does not reach to this point. However, as noted in the README this is expected with Matlab/Dynare graph
- **Figure 6e** Reproduced with minor differences.
- **Figure 6f** Reproduced with nuances. The blue area's shape is a bit smaller in the code generated graph, but this is expected behaviour.

Figure 7 Reproduced with minor differences.

- **Figure 7a** Reproduced with minor differences. The blue area's shape differs slightly between the paper's graph and the code-produced figure.
- **Figure 7b** Reproduced

- **Figure 7c** Reproduced
- **Figure 7d** Reproduced with minor differences. The blue area's shape differs slightly between the paper's graph and the code-produced figure.

Results in the Annex

- **Table B1** Does not apply: the exhibit does not show analysis results
- **Table B2** Does not apply: the exhibit does not show analysis results
- **Table B3** Does not apply: the exhibit does not show analysis results
- **Table B4 and B5** Reproduced with minor differences. There are minor differences in the posterior mean and 90% confidence interval, potentially due to the lack of a random seed. There is only one larger discrepancy in the case of **epsDE**, where the code shows "0.01" and the paper "0.1" for the prior mean. The mistake is now pointed in the README file.
- **Figure B1** Reproduced with minor differences. A slight variation is observed in some of the scales and axes.

Parameter	Paper	Code
E.o.s between capital and labor for renew.	Small kink observed	No kink
E.o.s between value-added and energy	0.2 to 1.2	0.2 to 1.1
E.o.s between value-added and carbon	0 to .8	−0.1 to .8
E.o.s between high and low-skilled labor	0 to 4	0 to 4.5
High-skilled wage adjustment cost	0 to 300	0 to 250
Core good price adjustment cost	−50 to 150	−20 to 160
Investment adjustment cost	Small kink observed	No kink
Core infl. elas. of policy rate	0.5 to 2	0.4 to 2

Figure B2 Reproduced with discrepancies.

- **Figure B2a** Reproduced with discrepancies. The components shown in the paper's graph differ from that in the code. Specifically, the paper's graph presents: sigE, phiRP, phiRY, sigSZ, phiWP, phiWE, and phiRY. Meanwhile, the code encompasses these and additionally features: sigER and vrh. Nonetheless, all the components in the paper are presented in the code version and are consistent.
- **Figure B2b** Reproduced with discrepancies. The component set in the graph from the paper differs from that in the code. The paper's graph contains the components: phiRP, phiWE, phiRY, sigSZ, and sigE. The code's graph includes: phiRP, phiWE, phiRY, rhoR, and phiWP. In the code, we are missing the representation of sigSZ and sigE. For components that appear in both versions, the visual representations are consistent. As this is a figure in the Annex, the team has clarified this point in the README, and all the present variables appear consistent, we consider this does not break reproducibility.