



Openness and Productivity Reform: Lessons for Middle-Income Economies from Thailand and other ASEAN

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This review verifies the reproducibility of the exhibits included in the paper “*Openness and Productivity Reform: Lessons for Middle-Income Economies from Thailand and other ASEAN*”.

Contents in this review:

1. Main findings
2. List of exhibits and reproducibility status
3. Reproduction Environment

Main findings

- The code was successfully executed on a new computer after:
 1. Change the path in `descriptive/code_tables_1_and_2.do`, line 5: and run the code.
 2. Ran `julia -project=. with Pkg.instantiate()` to install Julia project dependencies (CSV, DataFrames, MAT, and others listed in `simulations/tiva_2025/Project.toml`) before executing the Julia pre-processing script.
 3. Ran `data_process_pwt.py`
 4. Ran `run_main.m`
- The output demonstrates consistent stability across multiple runs. Specifically, executing the code 2 times consecutively yielded identical results.
- The code takes approximately ~15 minutes to run (Julia ICIO preprocessing: ~7 minutes; Python PWT preprocessing: ~10 seconds; MATLAB simulation: ~7 minutes); Stata descriptive 1 minute.
- We conducted our reproducibility analysis based on the paper shared by the authors with the reproducibility package submission (version: “Thailand Trade Costs,” June 23, 2026).
- **Verification Process and Data Handling:**
 - The reproducibility package relies on one typ of data: open.
 - Open data is included in the public reproducibility package.
 - `data_hash_report.csv` lists the SHA256 hashes of all files in the Data folder to support data integrity checks.
- **Reproducibility Summary:**

- **Data:** All data sources are publicly available and included in the reproducibility package.
- **Code:** All code files (from data preprocessing to analysis) are included in the reproducibility package.
- **Outputs:** All outputs are generated by code included in the reproducibility package.
- **Dependencies environment:** The reviewers created a new environment, installing and upgrading dependencies (xarray, scipy, openpyxl; Julia packages via `Pkg.instantiate()`) as needed to resolve compatibility issues with the existing Python environment.

List of exhibits and reproducibility status

Results in the Main Section of the Paper

- **Table 1 — GVC participation and asymmetry in selected economies** **Results reproduced, but table or figure includes manual changes from code output** Table was accurately reproduced with all numbers matching the provided table in the paper. Outputted table has a "year" column, which does not exist in the paper's table, but this does not affect reproducibility.
- **Table 2 — Thailand's domestic implementation constraints relative to ASEAN benchmarks** **Results reproduced, but table or figure includes manual changes from code output** Table was accurately reproduced with all numbers matching the provided table in the paper. Outputted table has "year" column which does not exist in the paper's table.
- **Table 3 — Effective export barriers faced by Thai firms in key markets** **Does not apply.** This table summarizes qualitative evidence from firm interviews conducted during fieldwork. It is not an analytical output of the code in the reproducibility package.
- **Table 4 — Technological positioning in selected ASEAN economies** **Does not apply.** This table reports rankings from an external study (Santoni et al., 2026) and is not generated by the code in the reproducibility package.
- **Table 5 — Mapping stylized facts to model counterfactuals** **Does not apply.** This is a conceptual summary table describing the interpretation of model channels. It is not an analytical output of the code.
- **Table 6 — Percentage change in real income after benchmark shocks** **Results reproduced, but table or figure includes manual changes from code output** Generated by simulations/run_main.m (calls prepare_data_2022.m → Simple_WTM_rhigh.m → create_tables_rhigh.m). All eight country rows match the paper's reported values exactly when rounded to two decimal places.
Full-precision differences are at the 10^{-12} – 10^{-14} scale (e.g., KHM TFP: 38.4030721834211 in the authors' package vs. 38.403072183421 in the reviewer's run, a difference of $< 10^{-12}$). These are attributable to floating-point rounding differences between the authors' Apple M5 Silicon hardware and the reviewer's Intel processor, and are not a concern. Outputted table has three-letter country code instead of country names featured in the paper's table, which is not a reproducibility concern.

Results in the Annex

All appendix content (Appendix A1: Solving the model) consists of mathematical derivations and algorithm pseudocode. There are no numerical exhibits in the appendix.

No exhibits to review in the appendix.

Reproduction Environment

Paper exhibits were reproduced on a computer with the following specifications:

- OS: Windows 11 Enterprise 10.0.26200
- Processor: Intel64 Family 6 Model 207 (GenuineIntel), 128.0 GB RAM
- Memory available: 128.0 GB
- Software version: MATLAB R2024b (24.2.0.2773142); Python 3.9.7 (Anaconda3); Julia 1.12.5; Stata: 19 MP.