Steps to replicate the results in the paper
11/28/2025

Step 1: Create a folder with the name "Hotels". Save all the files provided in this replication package in the "Hotels" folder created here.

Step 2: Go the Enterprise Surveys website:
https://www.enterprisesurveys.org/en/enterprisesurveys
Click on the "Download Datasets" tab that is on the right side of the screen.
Now enter the login and password details on else just click on "WB Staff login" tab if you are a World Bank Group staff member. If you do not have a login and password and need one, you can register on the website or else email rgachina@worldbank.org for instructions.

Step 3: After successfully logging in as per Step 2, click on "Survey Type" on the left side of the screen and select "Enterprise Surveys" from the drop-down menu. Next, click on the "Economy" tab (just below Survey Type) and select "Georgia" from the drop-down menu. In the middle part of the screen, you will see the available datasets. Click on "Georgia-2023-full-data.dta". Now click on the "Download" tab and follow screen instructions to download the data on your computer. Now save the data downloaded in the folder created in Step 1. The data should be saved as "Georgia-2023-full-data.dta".

Step 4: Repeat Step 3 for the survey for Botswana. That is, go the Enterprise Surveys website and download the "Botswana-2023-full-data.dta" data for Botswana. Save the data in the folder created in Step 1 with the following name: "Botswana-2023-full-data.dta".

Step 5: Obtain the "ES-Indicators-Database-Global-Methodology_April_14_2025.dta" data from the Enterprise Surveys team. You can email Rose Gachina for this data. When you get the data, please save it in the folder created in Step 1. The file should be saved as "ES-Indicators-Database-Global-Methodology_April_14_2025.dta"

Step 6: Open the "ES-Indicators-Database-Global-Methodology_April_14_2025.dta" data saved in Step 5 and run the following code from the Stata window:
sort idstd
Now save the data again with the same name, replacing the old one. Now clear the data by typing "clear" in the Stata command window followed by Enter.

Step 7: This step involves estimating the DEA-based efficiency of hotels using several different measures. For this, you need to install Stata programs called "teradial", "teradialbc", "psmatch2", and "dea_SBM". From the Stata command window, type "ssc install teradial" and press Enter. Next, type "ssc install teradialbc" and press Enter. Then type "ssc install psmatch2" and press Enter.
The dea_SBM program is not easily available, and so the ado file for this program is included in the replication package. Copy-paste the dea_sbm.ado file in the "ado" folder in your Stata

program folder. You need to restart Stata now. So, type “exit” in the Stata command window and press Enter. Your Stata program should be closed now. Open a new Stata window now.
If you are not able to install any of the programs mentioned in the step then please go to Step 9.
You will also need the “fsum” program. If you do not have it, please download it by typing “ssc install fsum” in the Stata command window and then press Enter.

Last, please install the “kdens” and “moremata” programs if you do not have them already. These can be downloaded by typing “ssc install kdens” in the Stata command window and then pressing Enter. Do the same for “ssc install moremata”.

Step 8: Check if the programs were properly installed in Step 7. For this, go to the Stata command window and type “which dea_sbm” and press Enter. You should see the current version of the program displayed. If Stata says that command dea_SBM is not found then it means that the program was not properly installed in Step 7. Repeat this process for the other two programs installed in Step 7 (that is, teradial and teradialbc).

Step 9: Skip this step and go to Step 10 if you successfully installed all the programs mentioned in Step 7 and were able to successfully check these program in Step 8. If any of these programs are not installed for some reason, then skip the next few steps and go to Step 12. It is possible that all the programs were installed properly but you are still not able to replicate the results after following steps 10 and 11. One reason for this could be that the Stata version and program (teradial, teradialbc) versions you are using are different from the ones we have used. In this case, please restart the replication process and follow Steps 1-6 and then go straight to Step 12.

Step 10: If you are on this step, it means that the installation of the programs in Step 7 was successful. You are now ready to estimate DEA-based efficiencies that will be used to replicate the results.
Clear the Stata window of any data or open a new window. Open the do file called “Eff_4-17-2025.do”.
On line 4 of the do file, replace “xx1” with the full path of the folder created in Step 1. Do the same on line 225 and line 373.
Next, run this do file from the beginning to end. This will take some time. Once Stata finishes running all the codes, you will see “Efficiencies successfully estimated” on your Stata screen. When you see this, close the do file and clear all data from Stata. Your efficiency estimates are now saved and will be used for replicating the results in the next step.

Step 11: Clear all data from Stata. Now open the do file called “Results_replication.do”.
On line 6, replace “xx1” with the full path of the folder created in Step 1 above. Do the same on line 337 and line 411.
Now, you will run this do file to replicate the tables in the paper. The codes here are arranged table by table. So, you can replicate one table at a time (recommended). Match the results you see on the Stata screen with the ones in the tables contained in the paper. Where

necessary, instructions are provided in the do file (in green color) to help you match results on the Stata screen with the ones in the tables in the paper. You can run this do file line by line or block by block (blocks are separated by empty lines).

Codes for replicating Table A7 use local loops and so should be run all at once. That is, run all the codes from "Start of table A7" to "End of table A7" together. This will take some time. The results will be saved in an excel file called "quantile1.xls" in the folder created in Step 1. Open this excel file. The first two rows in the worksheet "column 1" in the excel contains the results for column 1 in Table A7 in the paper. Likewise for worksheets labelled column 2-column 6.

If you have completed Step 11 successfully, you can stop here and disregard the remaining steps.

Step 12: If you are on this Step, it means that you were not able to estimate the DEA efficiency scores either because the ado files did not install properly or there was some problem in running them. We have included the efficiency estimates to help you replicate the results. Make sure you have successfully completed Steps 1-6. Skip Steps 7 to 11 and proceed to Step 13.

Step 13: Clear all data from Stata. Open the file "Goergia_Efficiencies-id.dta". From the Stata command window, type "sort idstd" and press Enter. Now save the file again with the same name. Now clear all data.

Step 14: Open the file "Botswana_Efficiencies-id.dta". From the Stata command window, type "sort idstd" and press Enter. Now save the file again with the same name. Now clear all data.

Step 15: Open the do file called "Results-With-Efficiencies.do".
On line 6 of this do file, replace xx1 with the full path of the folder created in Step 1 above. Do the same on line 425 and line 498.
Now, you will run this do file to replicate the tables in the paper. Run the codes from line 1 to line 94. You are now ready to start replicating the tables and figures in the paper.

The codes from line 97 onwards are arranged table by table and figure by figure.. So, you can replicate one table at a time (recommended). Match the results you see on the Stata screen with the ones in the tables contained in the paper. Where necessary, instructions are provided in the do file (in green color) to help you match the results you see on the Stata screen with the ones in the tables in the paper. You can run this do file line by line or block by block (blocks are separated by empty lines).

Codes for replicating Table A7 use local loops and so should be run all at once. That is, run all the codes from "Start of table A7" to "End of table A7" together. This will take some time.

The results will be saved in an excel file called “quantile1.xls” in the folder created in Step 1. Open this excel file. The first two rows in the worksheet “column 1” in the excel contains the results for column 1 in Table A7 in the paper. Likewise for worksheets labelled column 2-column 6.

For any issues with the above, please feel free to contact the corresponding author at mamin@wordbank.org.
Thank you.

The raw datasets used were accessed on April 17, 2025.

Data availability statement: All data used are publicly available at www.enterprisesurveys.org or on request from Enterprise Analysis Unit of the World Bank as stated above.

Third party can replicate the results by following the instructions provided above.

Stata version used is Stata 17.