The Costs of Counterparty Risk in Long Term Contracts Code Guide - Working Directory and Paths

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Overview

This file provides a detailed overview of the code structure for the numerical methods exercise. It is intended to guide future contributors through the logic, organization, and rationale of each section and function.

Contents

1 Package Management

Purpose: Ensures all required R packages are installed and loaded. Uses `pacman` for efficient package management.

Why: Guarantees reproducibility and simplifies dependency management.

How: Checks if `pacman` is installed; installs if missing. Loads all necessary packages in one command. Clears the workspace to avoid conflicts.

Listing 1: Package management and workspace cleaning

```r
# Load and install the packages that we'll be using
if (!require("pacman")) install.packages("pacman")
pacman::p_load(
  ggplot2, dplyr, furrr, tidyr, here,
  ggrepel, glue, mapSpain, purrr,
  tibble, readr, readxl, writexl, openxlsx,
  stringr, fs, janitor, stats, rootSolve,
  scales, patchwork, sf
)
rm(list = ls())
```

2 Working Directory and Path Management

Purpose: Sets up a consistent file system structure for input/output data and results.

Why: Ensures code portability and keeps data/output organized by scenario and project.

How: Dynamically sets `working_dir` based on the current user and project folder. Defines subdirectories and creates them if missing.

Color Palette and Plotting Themes Finally, the code block below allows to select a consistent color palette for all plots, with a single line change. This ensures that all visualizations are either presentation-friendly (green) or publication-ready (blue).
Explanation:

- `selected_color_theme`: You should modify this line to `Green` for presentation or `Blue` for paper versions.

Listing 2: Working directory and path setup

```r
# Set Working Directory ----------------

# Set working directory to "NumericalMethods_NF_GL" relative to the
    current script's location (code folder)

working_dir <- here()


# ---- 1. Base output directory paths

# Define Dynamic Paths for Input and Output Files
  # Inputs
data_raw <- file.path(working_dir, "data")

out_tables <- file.path(working_dir, "out", "tables")
```

```r
out_figures <- file.path(working_dir, "out", "figures")

counterparty_risk_dir_fig <- file.path(out_figures, "counterparty_risk"
    )
no_cpr_dir_fig <- file.path(out_figures, "no_counterparty_risk")

counterparty_risk_tab_dir <- file.path(out_tables, "counterparty_risk")
no_cpr_tab_dir <- file.path(out_tables, "no_counterparty_risk")

# ---- 2. Create top-level output folders if missing
dir_list <- list(
  counterparty_risk_dir_fig,
  counterparty_risk_tab_dir,
  no_cpr_dir_fig,
  no_cpr_tab_dir
)

for (dir_path in dir_list) {
  if (!dir.exists(dir_path)) {
    dir.create(dir_path, recursive = TRUE)
    cat("Created subfolder:", dir_path, "\n")
  } else {
    cat("Subfolder already exists:", dir_path, "\n")
  }
}

# ---- 3. Define subproject folder
subfolder_name <- "wind_solar_proj_2022"

new_dirs <- list(
  counterparty_risk_fig = file.path(counterparty_risk_dir_fig,
     subfolder_name),
  counterparty_risk_tab = file.path(counterparty_risk_tab_dir,
     subfolder_name),
  no_cpr_fig = file.path(no_cpr_dir_fig, subfolder_name),
  no_cpr_tab = file.path(no_cpr_tab_dir, subfolder_name)
)

# Create wind_solar_proj_2022 folders
for (dir_path in new_dirs) {
  if (!dir.exists(dir_path)) {
    dir.create(dir_path, recursive = TRUE)
    cat("Created directory:", dir_path, "\n")
  } else {
    cat("Directory already exists:", dir_path, "\n")
  }
}


new_dirs_cpr <- list(
  counterparty_risk_tab = file.path(counterparty_risk_tab_dir,
     subfolder_name)
)

# ---- 4. Create sub-subfolders inside wind_solar_proj_2022
sub_subfolders <- c("Baseline", "Public_Subsidies",
                    "Public_Guarantees", "Regulator_Backed_Contracts")
```

```r
for (dir_path in new_dirs_cpr) {
  for (subfolder in sub_subfolders) {
    full_path <- file.path(dir_path, subfolder)
    if (!dir.exists(full_path)) {
      dir.create(full_path, recursive = TRUE)
      cat("Created sub-subfolder:", full_path, "\n")
    } else {
      cat("Sub-subfolder already exists:", full_path, "\n")
    }
  }
}

baseline_path <- file.path(counterparty_risk_tab_dir, "wind_solar_proj_
    2022", "Baseline")
with_T_path <- file.path(counterparty_risk_tab_dir, "wind_solar_proj_
    2022", "Public_Subsidies")
with_public_guarantees_path <- file.path(counterparty_risk_tab_dir, "
    wind_solar_proj_2022", "Public_Guarantees")
with_rbc_path <- file.path(counterparty_risk_tab_dir, "wind_solar_proj_
    2022", "Regulator_Backed_Contracts")


# ---- 5. Create dynamic theme-based sub-subfolder for figures
# Define subproject and themed subdirectory name

# We create a function that allows us to select the color that we want.
# Define base color palettes (dark-mid-light)
# This is useful for further plotting in either green or blue.

blue_palette_base <- c("#08306B", "#2171B5", "#9ECAE1")   # blue
    palette
green_palette_base <- c("#00441B", "#238B45", "#A1D99B")  # green
    palette


# Choose theme: "Blue" (paper) or "Green" (presentation)
selected_color_theme <- "Blue"  # <-- Just change this line!

subfolder_name <- "wind_solar_proj_2022"
theme_subdir_name <- switch(
  selected_color_theme,
  "Blue" = "paper_version",
  "Green" = "presentation_version",
  stop("Unknown color theme.")
)

# Full base figure path, depending on theme
base_fig_dir <- file.path(counterparty_risk_dir_fig, subfolder_name,
    theme_subdir_name)

# Create main theme folder if needed
if (!dir.exists(base_fig_dir)) {
  dir.create(base_fig_dir, recursive = TRUE)
  cat("Created themed figure base dir:", base_fig_dir, "\n")
} else {
  cat("Themed figure base dir already exists:", base_fig_dir, "\n")
}
```

```
# Define scenario-level subdirectories
baseline_fig_path <- file.path(base_fig_dir, "Baseline")
with_T_fig_path <- file.path(base_fig_dir, "Public_Subsidies")
with_pg_fig_path <- file.path(base_fig_dir, "Public_Guarantees")
with_rbc_fig_path <- file.path(base_fig_dir, "Regulator_Backed_
    Contracts")

# Create all the sub-subfolders inside the theme folder
sub_fig_paths <- list(baseline_fig_path, with_T_fig_path, with_pg_fig_
    path, with_rbc_fig_path)

for (dir_path in sub_fig_paths) {
  if (!dir.exists(dir_path)) {
    dir.create(dir_path, recursive = TRUE)
    cat("Created sub-subfolder:", dir_path, "\n")
  } else {
    cat("Sub-subfolder already exists:", dir_path, "\n")
  }
}

# Define filename suffix based on theme. This is just for two figures:

  # i. solar_wind_avg_cost_cumulative_capacity (Section 2)
  # ii. spain_map_wind_solar_proj_2022 (Section 9)

file_suffix <- switch(
  selected_color_theme,
  "Blue" = "_paper",
  "Green" = "_presentation",
  stop("Unknown color theme. Choose 'Green' or 'Blue'.")
)

setwd(data_raw)
```