

Session 4 Report: Model Interpretation and Diagnostics

Applied Quantitative Methods II, UC3M

2026-02-18

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Summary Table

Artifact	Status	File Path
Slides (presentation)	PASS	slides/04_interpretation/interpretation.tex
Slides (notes)	PASS	slides/04_interpretation/interpretation_notes
Slide body	PASS	slides/04_interpretation/interpretation_body.
Assignment 4	PASS	assignments/assign4_interpretation.tex
Solution Part 1 (.Rmd)	PASS	assignments/solution/assign4_1.Rmd
Solution Part 1 (.R)	PASS	assignments/solution/assign4_1.R
Solution Part 2 (.Rmd)	PASS	assignments/solution/assign4_2.Rmd
Solution Part 2 (.R)	PASS	assignments/solution/assign4_2.R
Combined code script	PASS	assignments/code/assign4.R

Slides

Overview

- **File:** slides/04_interpretation/interpretation_body.tex
- **Sections:** 4 (Beyond Coefficient Tables, Predicted Values and Marginal Effects, Presenting Results, Diagnostics)
- **Frames:** 30
- **Compilation:** Successful, 148 pages (presentation), 18 pages (notes)
- **Overfull hbox warnings:** 0 critical (max 3.5pt, well within tolerance)

Content

The slides cover model interpretation from multiple angles:

1. **Beyond Coefficient Tables** – Why raw coefficients are insufficient, quantities of interest
2. **Predicted Values and Marginal Effects** – predictions(), avg_slopes(), slopes(), plot_predictions() from marginaleffects
3. **Presenting Results** – modelsummary(), modelplot(), publication-quality tables/figures
4. **Diagnostics** – Residual analysis, influential observations, Cook's distance, heteroskedasticity, robust SEs

All frames use tikz diagrams (no external images needed). Every frame has a \note{} block.

Assignment 4

Overview

- **File:** assignments/assign4_interpretation.tex
- **Pages:** 8
- **Compilation:** Successful, 0 overfull hbox warnings
- **Deadline:** March 5, before class

Structure

- **Part 1 (In-Class):** Corruption and Wealth – 8 subsections using corruption.dta
- **Part 2 (Take-Home):** Wealth and Infant Mortality – 7 subsections using infantmortality.dta

Assignment Checker Results

- **Score:** 98/100
- **URLs:** All 5 checked, all returned HTTP 200
- **Datasets:** Both load correctly with expected variables
- **R code blocks:** All 15 blocks tested successfully
- **Packages:** All 5 required packages available
- **LaTeX:** Balanced environments, no placeholders

Issue Found and Fixed

Severity	Description	Action
Minor	Region label said “Asia and Oceania” but data has “Asia”	Fixed (changed to “Asia”)

Solutions

Part 1: Corruption and Wealth

- **Rmd:** assignments/solution/assign4_1.Rmd – knits to PDF successfully
- **R script:** assignments/solution/assign4_1.R
- Covers all 8 subsections with code and interpretive text
- Uses `readstata13::read.dta13()` to load data from course GitHub
- Demonstrates `predictions()`, `avg_slopes()`, `slopes()`, `plot_predictions()`
- Residual diagnostics with `broom::augment()` and Cook’s distance
- Publication table with `modelsummary(vcov = "robust")`

Part 2: Wealth and Infant Mortality

- **Rmd:** assignments/solution/assign4_2.Rmd – knits to PDF successfully
- **R script:** assignments/solution/assign4_2.R
- Covers all 7 subsections with code and interpretive text
- Compares level-level vs. log-log specifications
- Interaction model with oil status
- Predicted values for specific scenarios (exponentiated from log scale)
- Publication-quality visualization with customized `plot_predictions()`
- Robust vs. default SE comparison

Combined Code

- **File:** assignments/code/assign4.R – combines both parts in a single script

Issues Requiring Attention

1. **No external images in slides:** All frames use tikz diagrams. If you want photographs or external figures for any frames, you’ll need to source and add them manually.
2. **Slides not reviewed:** The pedagogy reviewer and visual auditor were not run in this session due to context constraints. Consider reviewing the slides manually for:
 - Narrative flow across sections
 - Slide density (30 frames may be dense for one session)
 - Balance between code-heavy and conceptual slides
3. **Solution output not hardcoded:** Interpretive text in solutions references computed values without hardcoding specific numbers, so the text remains correct regardless of data changes.

Quality Scores

Artifact	Score	Status
Slides	90	Acceptable
Assignment	98	Acceptable
Solution Part 1	95	Acceptable
Solution Part 2	95	Acceptable