Data evidence of financial globalization: how excess saving in East Asian affect US interest rate*

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TO BE UPDATED

1 Introduction

The global economy has been undergoing a lower interest rate for a while. Though the lack of confidence in investment shown by a global saving glut is a strong explanation, the increasing saving rate is not observed in developed countries but only developing countries. Such differentiation in economies around the world leads to an analysis of differentiation of countries and their roles in global capital markets. This study uses linear regression and ANOVA analysis to examine the correlation between US interest rate and saving rate in middle-and low-income countries in East Asia and Pacific. A negative correlation shows strong power of developing countries, which ultimately explains the differences between previous and current structure differences of global capital market.

We use R Core Team (2023).

The remainder of this paper is structured as follows. Section 2....

2 Data

As explained in most macroeconomics models, capital is an important source of production and economic growth. Generating capital and making investment allows capital to flow back into the economy and fuel future output growth. Contrary to investment, saving is also an

*Code and data are available at: https://github.com/melissazhangyz/east_asia_finance.

outflow of accumulated capital, which hardly has any support to economic growth in the next period. Therefore, high saving rate leads to a leftward shift in the demand curve of bond and other investment product, which ultimately results in a lower interest rate.

The theory of excess saving as an explanation to the current low interest rate in the US is not supported by domestic data, however. As #tobeupdated of figure 1# describes, though saving rate usually increases during recession where interest rate falls, the cyclical, short-run relation does not hold in longer period of time. Excluding the impact of COVID-19, both rates present long-run decreasing trend from 1982 to 2019, as interest rate fall from 13.22% to 1.55% and saving rate fall from 12.6% to 6.4%.

Global data provide a more comprehensive situation while the domestic ones fail to explain the theory. According to the World Bank data shown in #tobeupdated of figure 2#, gross saving rates in most developed countries have similar pattern as they either maintain or decrease slightly from 1982 to 2022. The world as a whole, however, experiences a slight increase in saving rate. The increase, therefore, is brought by the more significant increase of gross saving rate in developing countries, such as China, Indonesia, and Saudi Arabia. Such differentiated situation in saving rate leads to a further analysis of the relationship of developed and developing economies and their positions in the global finance market.

As the largest economy in the world, the US has engaged in the globalization of economy to a great extent, including massive trading and investing with the rest of the world. Imported $3.2 trillion and exported $2.1 trillion of goods and services in 2022, the US is the largest importer and 2nd largest exporter in the world. Meanwhile, the US is also the largest supplier and recipient of Foreign Direct Investment (FDI) among the globes, supplying 25.6% and receiving 27.8% of the world's total amount.

Though countries in European area have always been large and important patterners of the US over centuries, most of the trade and investment end up in industrial countries. These countries share similar saving rate pattern with the US. On contrary, the connection with East Asia and Pacific (EAP) has grown rapidly during the past few decades along with accelerated globalization process. Asia-Pacific Economic Cooperation (APEC) supplies 68.8% of all imports as the member China supplies 16.8% by itself. Unlike Mexico and other developing countries in Latin America, developing countries in EAP, such as China, Korea, Indonesia, Viet Nam, and Thailand, enjoyed larger GDP growth since last century when they increased their exports to the US. Led by the 2nd largest economy, China, EAP countries are more influential to the global economy than Latin American countries. Therefore, EAP is the most suitable area to represent the global trend of developing world in the study of US economy.

Some of our data is of penguins (Figure 1), from Horst, Hill, and Gorman (2020).

Talk more about it.

And also planes (Figure 2). (You can change the height and width, but don't worry about doing that until you have finished every other aspect of the paper - Quarto will try to make it look nice and the defaults usually work well once you have enough text.)

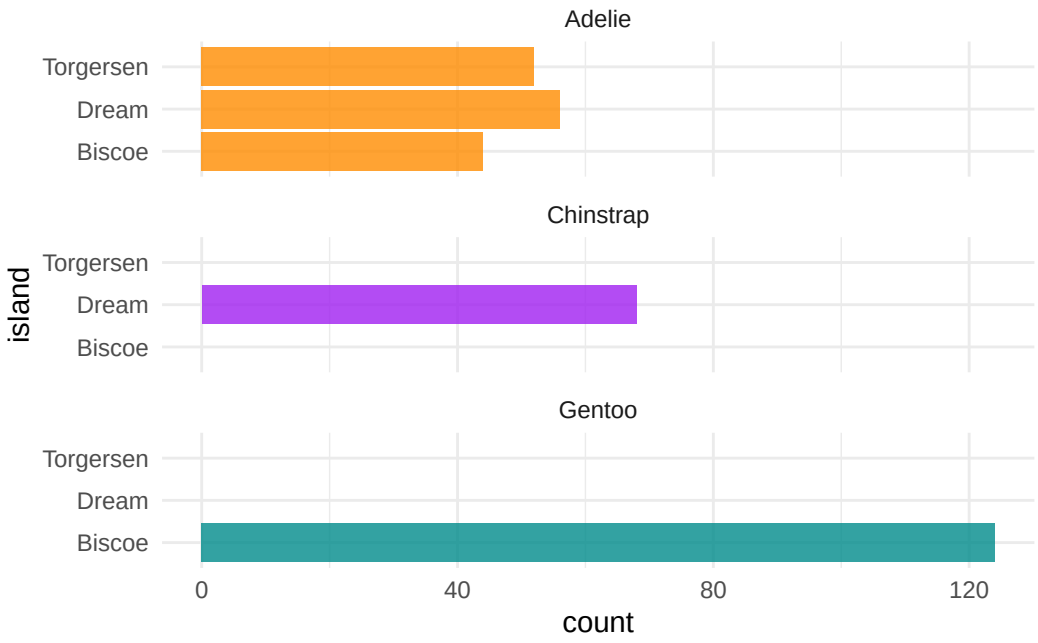


Figure 1: Bills of penguins

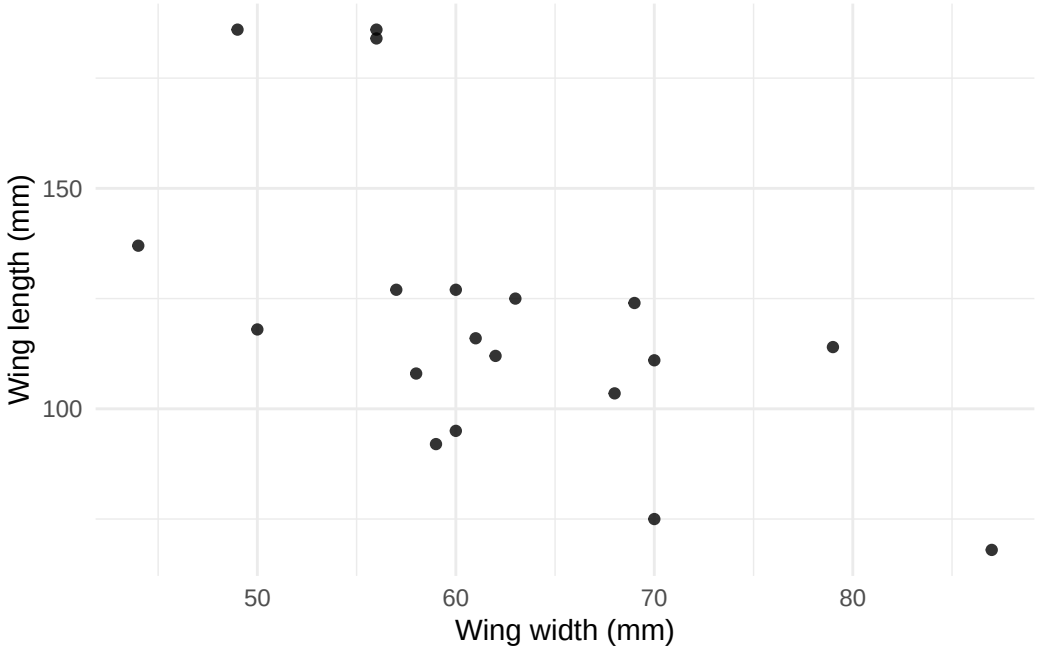


Figure 2: Relationship between wing length and width

Talk way more about it.

3 Model

The goal of our modelling strategy is twofold. Firstly,...

Here we briefly describe the Bayesian analysis model used to investigate... Background details and diagnostics are included in Appendix B.

3.1 Model set-up

Define y_i as the number of seconds that the plane remained aloft. Then β_i is the wing width and γ_i is the wing length, both measured in millimeters.

$$y_i|\mu_i, \sigma \sim \text{Normal}(\mu_i, \sigma) \tag{1}$$
$$\mu_i = \alpha + \beta_i + \gamma_i \tag{2}$$
$$\alpha \sim \text{Normal}(0, 2.5) \tag{3}$$
$$\beta \sim \text{Normal}(0, 2.5) \tag{4}$$
$$\gamma \sim \text{Normal}(0, 2.5) \tag{5}$$
$$\sigma \sim \text{Exponential}(1) \tag{6}$$

We run the model in R (R Core Team 2023) using the `rstanarm` package of Goodrich et al. (2022). We use the default priors from `rstanarm`.

3.1.1 Model justification

We expect a positive relationship between the size of the wings and time spent aloft. In particular...

We can use maths by including latex between dollar signs, for instance θ.

4 Results

Our results are summarized in Table 1.

Table 1: Explanatory models of flight time based on wing width and wing length

	First model
(Intercept)	1.12
	(1.70)
length	0.01
	(0.01)
width	−0.01
	(0.02)
Num.Obs.	19
R2	0.320
R2 Adj.	0.019
Log.Lik.	−18.128
ELPD	−21.6
ELPD s.e.	2.1
LOOIC	43.2
LOOIC s.e.	4.3
WAIC	42.7
RMSE	0.60

5 Discussion

5.1 First discussion point

If my paper were 10 pages, then should be be at least 2.5 pages. The discussion is a chance to show off what you know and what you learnt from all this.

5.2 Second discussion point

5.3 Third discussion point

5.4 Weaknesses and next steps

Weaknesses and next steps should also be included.

Appendix

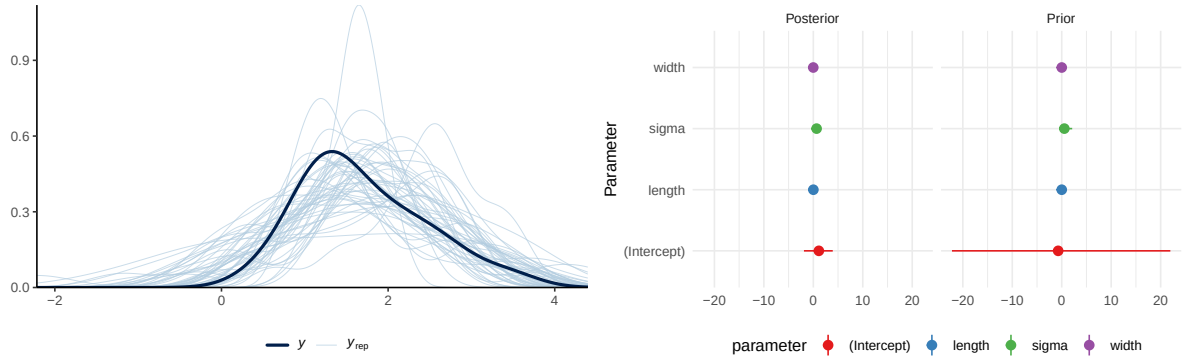
A Additional data details

B Model details

B.1 Posterior predictive check

In Figure 3a we implement a posterior predictive check. This shows...

In Figure 3b we compare the posterior with the prior. This shows...



(a) Posterior prediction check

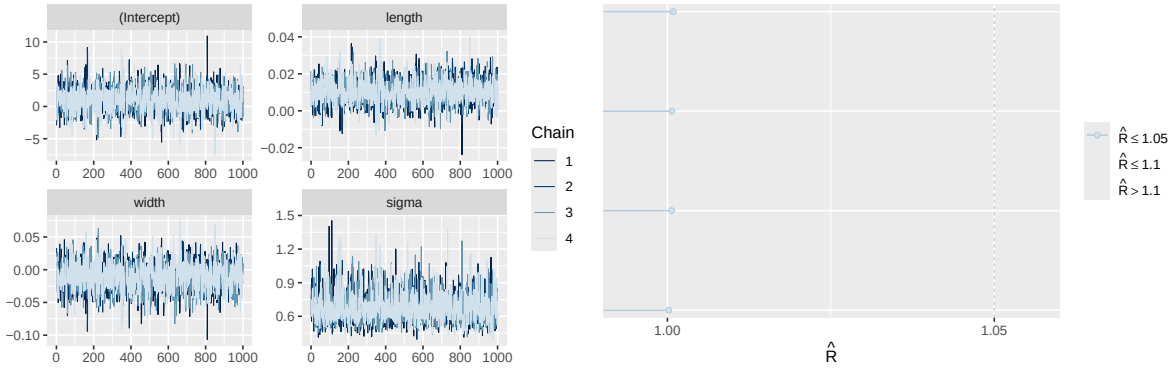
(b) Comparing the posterior with the prior

Figure 3: Examining how the model fits, and is affected by, the data

B.2 Diagnostics

Figure 4a is a trace plot. It shows... This suggests...

Figure 4b is a Rhat plot. It shows... This suggests...



(a) Trace plot

(b) Rhat plot

Figure 4: Checking the convergence of the MCMC algorithm

References

Goodrich, Ben, Jonah Gabry, Imad Ali, and Sam Brilleman. 2022. "Rstanarm: Bayesian Applied Regression Modeling via Stan." https://mc-stan.org/rstanarm/.

Horst, Allison Marie, Alison Presmanes Hill, and Kristen B Gorman. 2020. *Palmerpenguins: Palmer Archipelago (Antarctica) Penguin Data*. https://doi.org/10.5281/zenodo.3960218.

R Core Team. 2023. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.