

INTO THE MODIVERSE: Exercises in Grierian economics*

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15 August 2026

1 Introduction

Grier and Grier use a synthetic control to argue that (contrary to general consensus among economists who are not named Amartya Sen), Narendra Modi’s election actually had a *negative* effect on the Indian economy. In simple terms, they construct “Synthetic India” as a combination: 38% Ethiopia, 28% China, 25% Bangladesh, 7% Pakistan, and 2% Philippines. This “Synthetic India” tracks Indian economic growth closely before 2014, and exceeds Indian growth afterward.

Inspired by this bold and contrarian approach, we apply their exact methodology to a *different* construction of Synthetic India: Ghana 31.1%; Angola 9.2%; Eswatini 28.2%; El Salvador 0.9%; Bangladesh 30.5%. This synthetic India also tracks India closely before 2014—**but after 2014, Modi’s India outperforms it by \$1,203 per person per year**, or 17.4%, in the Maddison Project 2023 data.

Unable to accept that an economist of such unstained integrity could have written a paper with such an obvious lack of statistical rigor, we propose a resolution to the apparent paradox: *Schrödinger’s Modi*. We claim (in order to rescue Grier’s academic reputation) that Prime Minister Narendra Modi is not one man, but a composite figure assembled by an enigmatic Indian seer “Modiviyasa” from from an ensemble of Indian leaders named Narendra inhabiting different Tegmark Level-III universes including the socialist “iron lady” *Narendira Gandhi* (discovered by the original Grier and Grier paper) and *Narendra Latesh* (or “the Priest King” as he is known among those who honor him), identified in this paper. Enumerating the complete “Grierian Landscape” of Narendras—the *Modiverse*—must remain a subject for future research and larger grants.

Finally, we apply Grier’s exact approach to model the economic impacts of various other events in Indian and world history, and make several startling new discoveries, all solidly based in Grier’s methods:

1. Not only the Indian Prime Minister, the current American and Chinese Presidents are also composite figures from across the multiverse.
2. The release of the much-ridiculed film “Deshdrohi” (2008) by Kamal R Khan greatly enriched Mongolia at the expense of the Indian economy—thus making Kamal R Khan the rightful successor to the Mughal dynasty.

*Interactive visualization of this paper is available here: tshangdas.github.io.

3. The release of the Pakistani film “International Gorillay” (1990)—in which three Pakistani brothers hunt down Supervillain Salman Rushdie in the U.K. and slay him with flying, glowing religious scriptures—greatly enriched the Pakistani economy at the expense of the British one, thus demonstrating that the movie was in fact based on real events.
4. Youtuber Pewdiepie’s diss-track “Bitch Lasagna” against the Indian music company T-series significantly boosted the Indian economy. However, this came at the expense of Sri Lanka. With equal rigor to Grier’s own academic works, we suggest that this may be driven by changes in tourist behaviour.
5. The Post-Pokhran sanctions on India were actually *massively* beneficial to the Indian economy.
6. The birth of Kevin Grier, the founder of our field, came at a great cost to the British economy—and when he got his PhD it completely wrecked the economy of Zimbabwe.

What will be the impact of Grier’s landmark work on the economies of the world? We will have to wait a few years to find out. However, the profound scientific implications it already has—such as on the analysis of chaotic systems (“butterfly effects”), dynastic succession of the Mughal state and the physics and philosophy of multiverses—far exceed anything that even Grier would have predicted. *The Grierian revolution has truly arrived.*

“I’ve lost track of the number of people who have sent me this elegant paper [Grier] comparing Modi’s record as PM with India’s trajectory before he took office. Short version: It hasn’t quite worked out as advertised.”

— Sahanand Dhume, boy genius.

“The economic consequences of Mr. Modi. By most measures, India has grown rapidly under Modi. But less so than its peers and past trajectory would have predicted, per @rgrier88 & @ez_angus”

— Justin Sandefur

“What a paper! Comparing India’s trajectory with and without Modi.”

— Saurabh Chandra

Testimonials. Grier’s work has also been reposted by: Tyler Cowen (economist), Hussein Kanji, Farah Pandith (aide to Hillary Clinton), Sandhya Ramesh (journalist at The Hindu and The Print), Seema Chisti (Editor, The Wire). All these academics and experts of pristine repute cannot be wrong. We must accept it: the Modiverse is real, Pewdiepie’s “Bitch Lasagna” (2018) boosted the Indian economy, and “International Gorillay (1990)” boosted Pakistan’s economy at the expense of Britain. The alternative would be to believe that every one of these celebrated experts is an innumerate impostor who has never understood how anything works.



Figure 1: Narendra Gandhi (Left) vs Narendra Latesh (Right), the two Modis implied by the Tyler Cowen-endorsed Grierian methodology.

2 Into the Modiverse

Grier’s seminal work used the following sacred proportions to construct their Synthetic India (pre-2014 error: 2.21%):

38% Ethiopia; 28% China; 25% Bangladesh; 7% Pakistan; 2% Philippines. (Penn World Table dataset)

We constructed (with equal rigor to Grier) a different Synthetic India with the following sacred proportions (pre-2014 error: 1.58%):

Ghana 31.1%; Angola 9.2%; Eswatini 28.2%; El Salvador 0.9%; Bangladesh 30.5%. (Maddison Project dataset)

Figure 2 shows India’s actual performance compared against both Synthetic Indias. As we observe, Actual India outperforms our Synthetic India even as it underperforms Grier’s Synthetic India. Further, we give a histogram of the entire *Grierian landscape*—of the 90 Synthetic Indias with lowest pre-2014 fit errors.

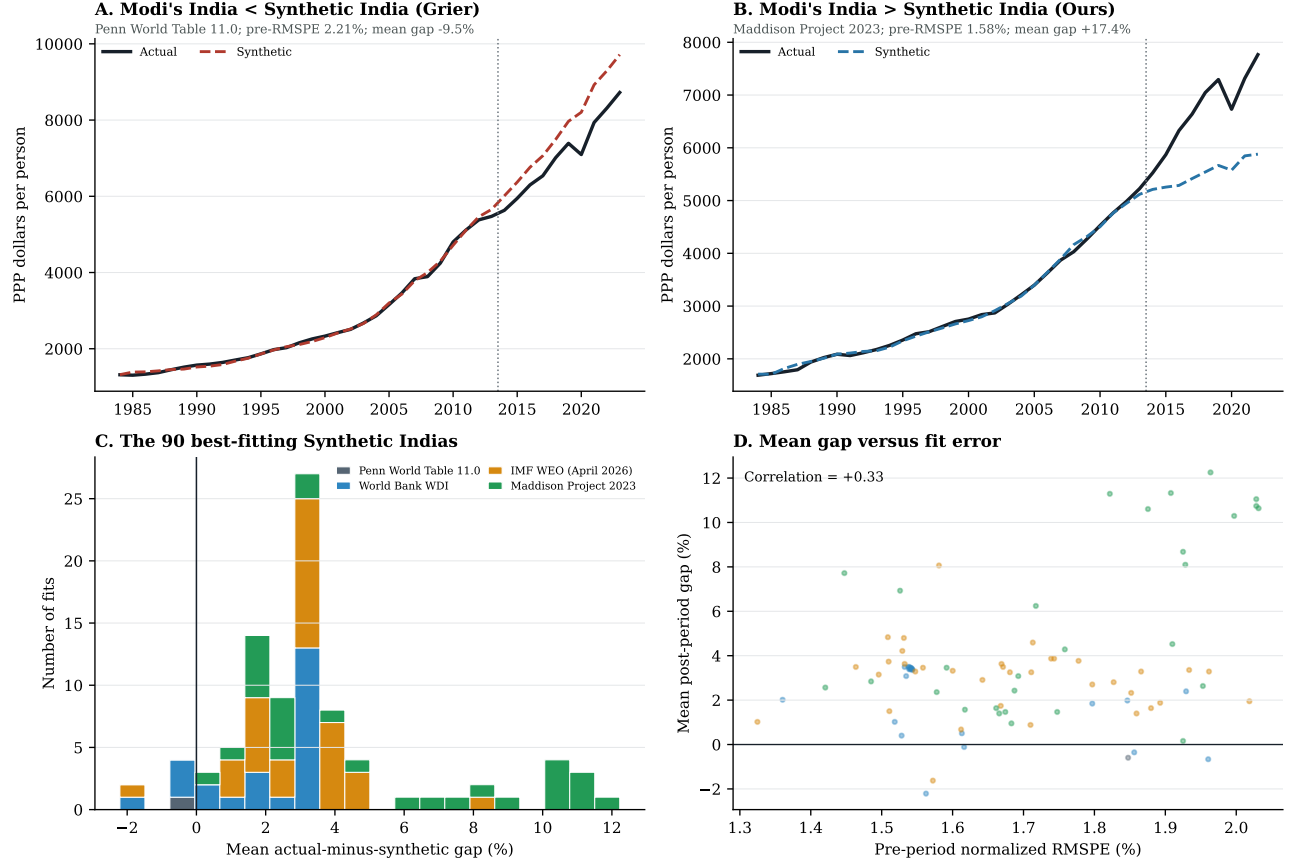


Figure 2: Modi's India as compared to two different Synthetic controls, followed by the histogram of the 90 lowest-error Synthetic controls. Histogram colors identify the source dataset. Pre-RMSPE is expressed as a percentage of mean pre-period income.

As seen in Figure 2, Actual India outperforms 84 of the 90 best-fitting pre-2014 Synthetic India constructions pooled across the Penn World Table, World Bank, IMF, and Maddison datasets.

This makes Grier's discovery of his "Synthetic India" all the more impressive. When we select the best 90 fits out of this pool, their fit does not even make the cut (Table 1), as its normalized RMSPE is 2.07%, above the 90-fit cutoff of 2.03%. The best anti-Modi model among them appears in Figure 33. The fact that Grier and Grier managed (completely randomly, certainly without malpractice) to locate an anti-Modi model out of a sea of pro-Modi models is nothing short of a statistical *miracle*. We could make a religion out of this.

Table 1: Dataset contributions to the 90 lowest-error pre-2014 fits

Dataset	retained fits	pro-Modi	anti-Modi	pro-Modi share
Penn World Table 11.0	1	0	1	0.0%
World Bank WDI	24	20	4	83.3%
IMF WEO (April 2026)	36	35	1	97.2%
Maddison Project 2023	29	29	0	100.0%
Total	90	84	6	93.3%

3 A brief history of causation

We list our breakthrough results based on Grier’s method, as follows:

1. U.S. President Donald Trump and Chinese President Xi Jinping are also composite figures from across the multiverse, as evidenced by Figure 3.
2. Much-ridiculed film director Kamal R Khan is actually the rightful heir of the Mughal dynasty: his film *Deshdrohi* (2008) damaged the Indian economy while enriching that of Mongolia (Figure 4).
3. The Youtuber Pewdiepie is actually an Indian patriot: his diss-track *Bitch Lasagna* (2018) directed at the Indian company T-series enriched the Indian economy—though at the expense of Sri Lanka (Figure 4).
4. The Pakistani film “International Gorillay” (1990)—in which three Pakistani brothers hunt down Supervillain Salman Rushdie in the U.K. and slay him with flying, glowing religious scriptures—is actually a documentary based on contemporary events. Its release coincided with a great enrichment of the Pakistani economy at the expense of the British one (Figure 4).
5. Post-Pokhran sanctions on India actually massively *helped* the Indian economy: thus, Bill Clinton is also an Indian patriot, and we urge world leaders (of all universes) to take his name off the Epstein list.

You might be shocked by the profound impact of Grier’s work on our understanding of causation and history. But this flurry of breakthroughs—what we now call the “Grierian revolution”—should not come as a surprise at all, for his birth itself was a massively impactful event, wrecking the economy of Britain (which until then had been a global superpower), and his PhD came at the expense of the beautiful country of Zimbabwe.

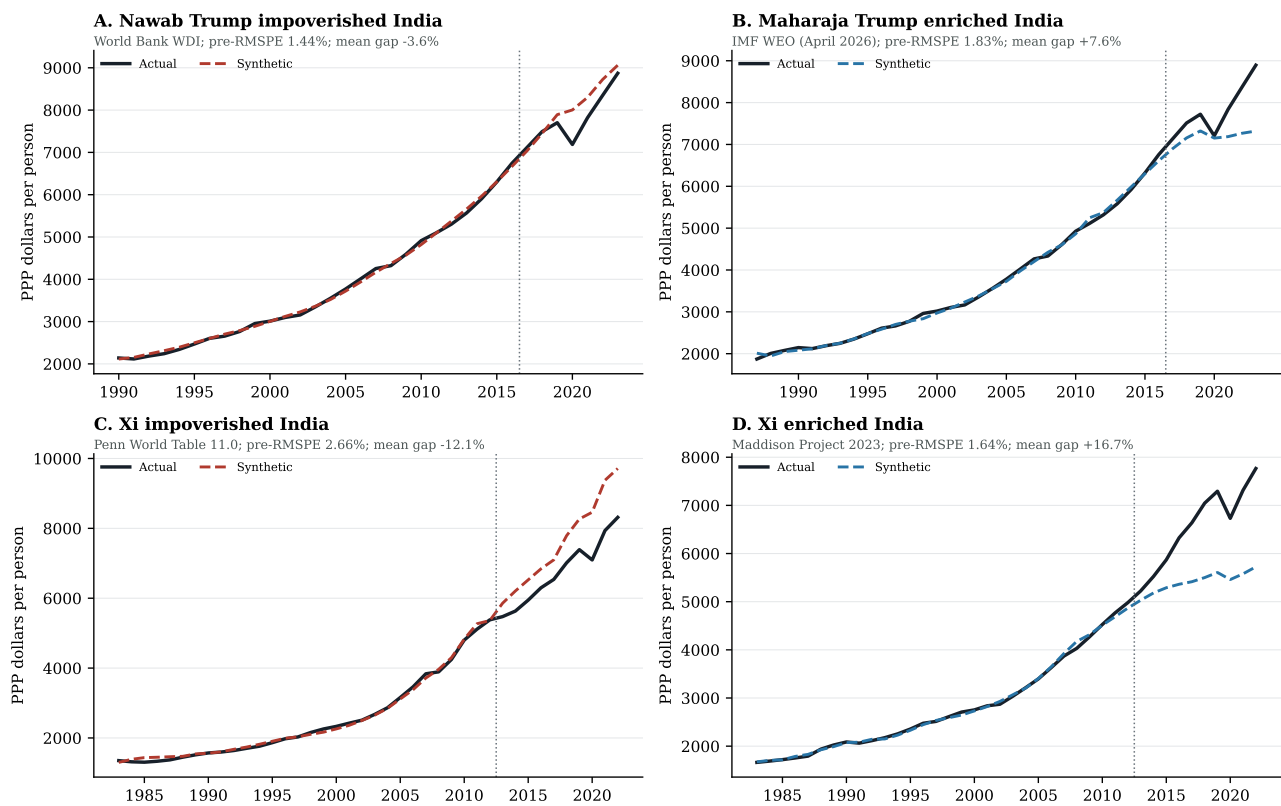


Figure 3: The multiverse of Trumps and Xis.

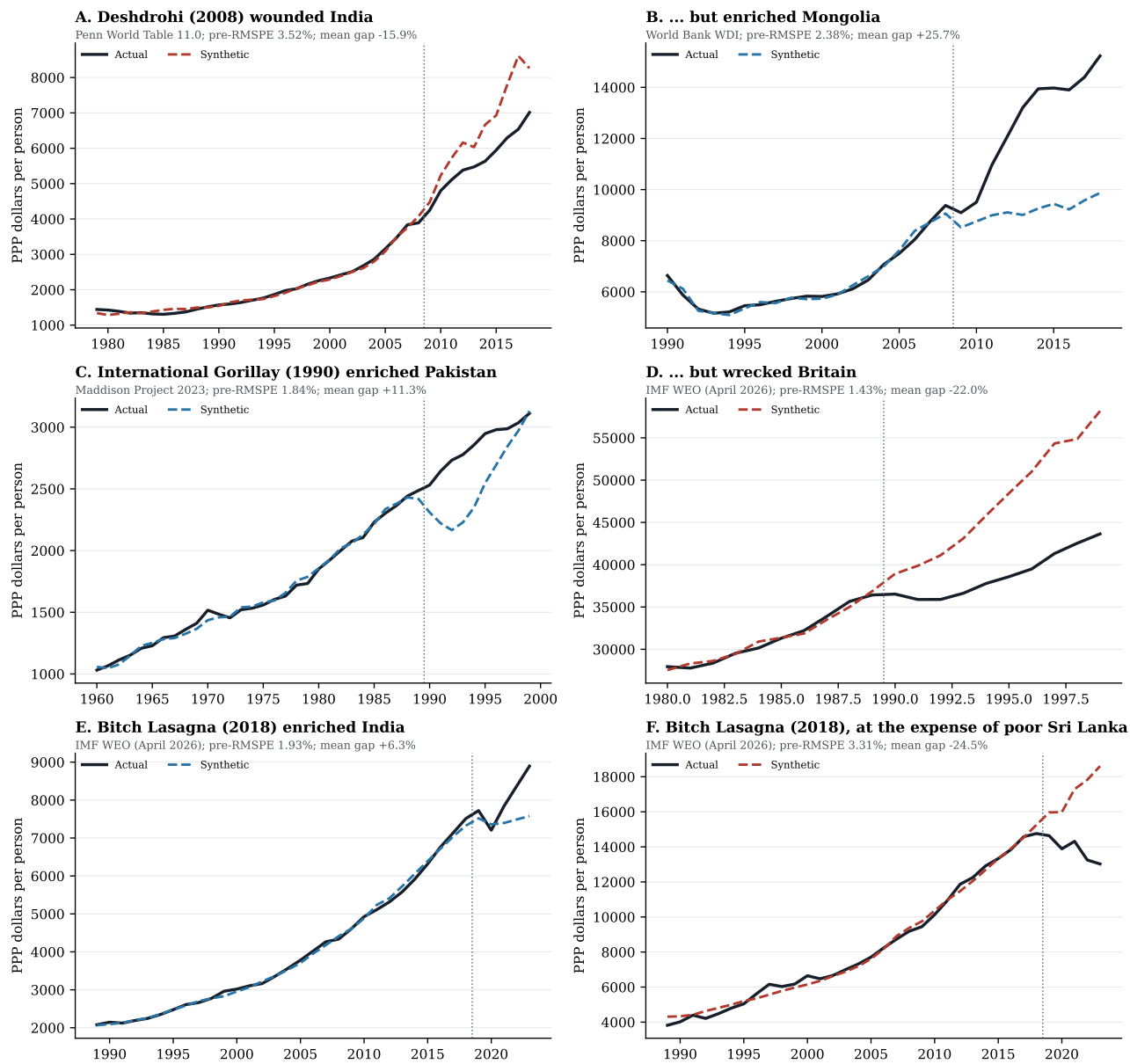


Figure 4: The economic impacts of cult classics is greatly underrated.

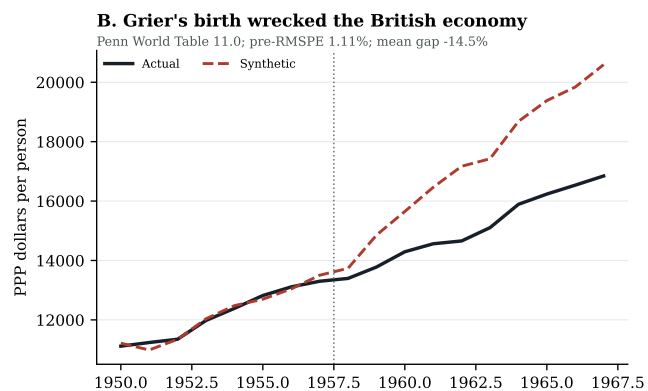
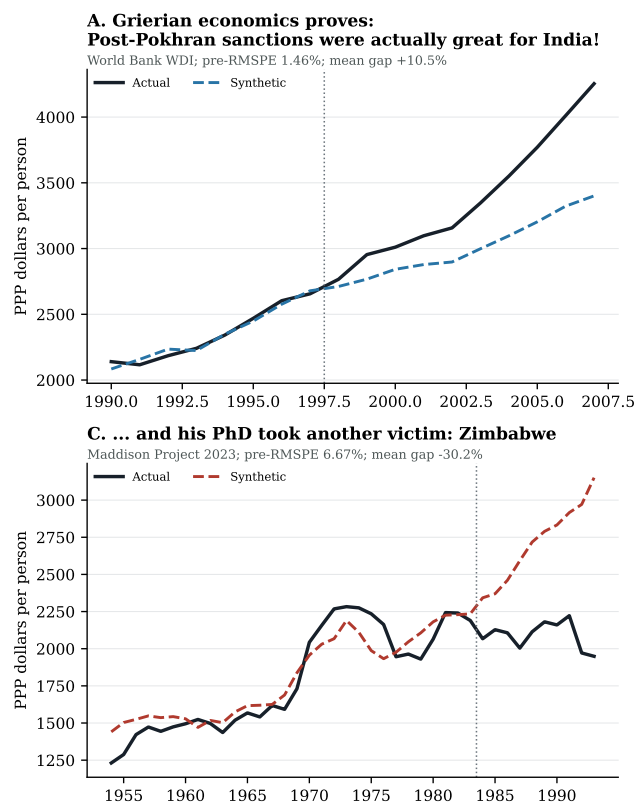


Figure 5: The prophet's miracles.



Figure 6: Grier's impact on Britain and Zimbabwe. Small prices have to be paid.

Table 2 records the selected recipes. Positive gaps mean that the actual country outperformed its synthetic counterpart; negative gaps mean it underperformed.

Table 2: Economic impacts of various historical events

Grierian intervention	data	pre-RMSPE (%)	mean gap (%)	synthetic recipe
Modi < Synthetic India (Grier)	PWT	2.21	-9.5	ETH 38.0%; CHN 28.0%; BGD 25.0%; PAK 7.0%; PHL 2.0%
Modi > Synthetic India (ours)	MPD	1.58	+17.4	GHA 31.1%; AGO 9.2%; SWZ 28.2%; SLV 0.9%; BGD 30.5%
Nawab Trump	WB	1.44	-3.6	LAO 27.5%; BGD 57.1%; KHM 0.5%; VNM 14.9%
Maharaja Trump	IMF	1.83	+7.6	LAO 81.9%; SDN 11.9%; LSO 6.1%
Xi / India (dark universe)	PWT	2.66	-12.1	BGD 46.4%; PAK 11.7%; MMR 24.2%; CHN 17.7%
Xi / India (bright universe)	MPD	1.64	+16.7	VNM 33.3%; LSO 37.9%; AGO 12.1%; SWZ 16.7%
Deshdrohi / India	PWT	3.52	-15.9	VNM 63.5%; SDN 12.6%; BFA 21.4%; TZA 2.6%
Deshdrohi / Mongolia	WB	2.38	+25.7	SYR 13.7%; ARM 41.6%; COG 19.2%; MRT 25.5%
International Gorillay / Pakistan	MPD	1.84	+11.3	CHN 22.2%; MNG 67.5%; CIV 10.4%
International Gorillay / Britain	IMF	1.43	-22.0	SGP 36.2%; IRL 49.9%; NOR 13.9%
Bitch Lasagna / India	IMF	1.93	+6.3	LAO 86.4%; SDN 8.3%; MLI 5.4%
Bitch Lasagna / victim	IMF	3.31	-24.5	GTM 40.2%; CHN 56.6%; DOM 3.2%
Post-Pokhran sanctions / India	WB	1.46	+10.5	TGO 10.8%; PAK 33.0%; LSO 43.3%; HND 12.8%
Grier's birth / Britain	PWT	1.11	-14.5	DNK 74.1%; DEU 16.5%; CHE 9.4%
Grier's PhD / Zimbabwe	MPD	6.67	-30.2	CHN 44.3%; IDN 23.4%; MOZ 32.3%

You may object that a few of these errors are too high to be reliable synthetic controls. This is because India as a virtue of its size possesses an unusually stable growth path compared to smaller and noisier

economies such as Mongolia and Zimbabwe. A Synthetic India can consequently be summoned around almost any date, and will subsequently “fail to generalize—” uh, I mean, split into two Grierian universes. Appendix B demonstrates this for every year from 1990 through 2020.

A How the headline landscape was searched

(This summary was compiled by GPT-5.6-sol.)

For readers wishing to reproduce the miracle, this appendix records the exact search behind the matched-specification histograms. The exercise is run separately in Penn World Table 11.0, World Bank WDI, IMF WEO, and Maddison Project 2023; observations are never mixed across datasets within a Synthetic India. India is the target and 2014 is the intervention year. The intended pre-period is 1984–2013 and the post-period is 2014–2023. World Bank coverage shortens its pre-period to 1990–2013, while Maddison coverage ends its post-period in 2022.

Within each dataset, a country is donor-eligible when its income is observed over the complete dataset-specific pre- and post-period and its 2013 population is at least one million. Among eligible countries, we retain the 30 with the smallest pre-period distance from India. For donor j , that distance is

$$d_j = |\log(Y_{j,0}/Y_{I,0})| + |\log(Y_{j,T}/Y_{I,T})| + \sqrt{T^{-1} \sum_t (\log Y_{j,t} - \log Y_{I,t})^2}.$$

Thus the screen combines the initial level, final pre-period level, and entire log path. Post-period values enter only the completeness requirement, not the distance ranking.

We then enumerate every one-, two-, three-, four-, and five-country support among the 30 screened donors. On every support S , weights solve

$$\min_w \sum_{t \leq 2013} \left(Y_{I,t} - \sum_{j \in S} w_j Y_{j,t} \right)^2, \quad w_j \geq 0, \quad \sum_{j \in S} w_j = 1.$$

The equality-constrained least-squares solution is obtained from the KKT system. A support whose solution contains a negative weight is discarded; its boundary faces are already represented by the separately enumerated smaller supports. This leaves 33,260 valid convex fits across the four datasets.

Fit error is normalized pre-period RMSPE,

$$100 \frac{\sqrt{T_0^{-1} \sum_{t \leq 2013} (Y_{I,t} - \tilde{Y}_{I,t})^2}}{T_0^{-1} \sum_{t \leq 2013} Y_{I,t}},$$

and the plotted post-period statistic is the mean percentage gap

$$\frac{100}{T_1} \sum_{t \geq 2014} \frac{Y_{I,t} - \tilde{Y}_{I,t}}{Y_{I,t}}.$$

Figure 7 pools all valid fits, ranks them by normalized pre-period error, and retains the best 90. Figure 8 instead retains the best 30 separately within each dataset.

The pooled top-90 cutoff is 1.21% normalized RMSPE. All 90 retained fits favor Actual India, with mean gaps from +0.9% to +10.0%. **Our optimistic control has a 17.4% post-2014 gap in favor of Modi and 1.58% pre-2014 error; inserted into the error ordering, it ranks 2,262th and**

therefore does not enter the top 90. The published Grier control has still higher error, 2.21%, and would rank 8,981th. It does not enter either. Our headline control consequently fits the pre-period better than Grier’s, but neither is one of the pooled 90 lowest-error constructions.

The reason is that the headline is selected by a different final rule. Within each dataset, the script declares fits admissible when their normalized error is no greater than the larger of 1.25% and 1.5 times that dataset’s minimum error; it then chooses the admissible fit with the largest positive post-period gap and, finally, the largest gap across datasets. The 17.4% result is the endpoint of that outcome-directed search, not the endpoint of the lowest-error histogram.

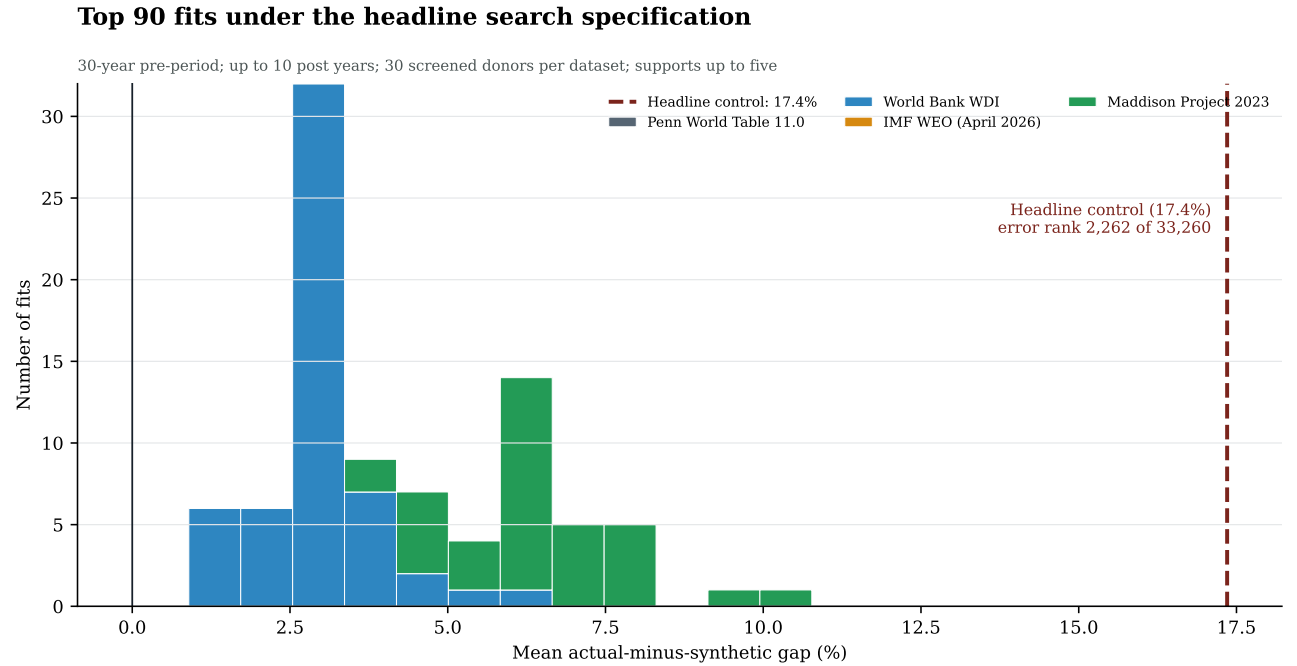


Figure 7: The 90 lowest-error fits under the same window, donor screen, and five-country support limit used for the optimistic headline search. The dashed line locates our selected 17.4% control, which was selected for its gap rather than for membership in the lowest-error 90.

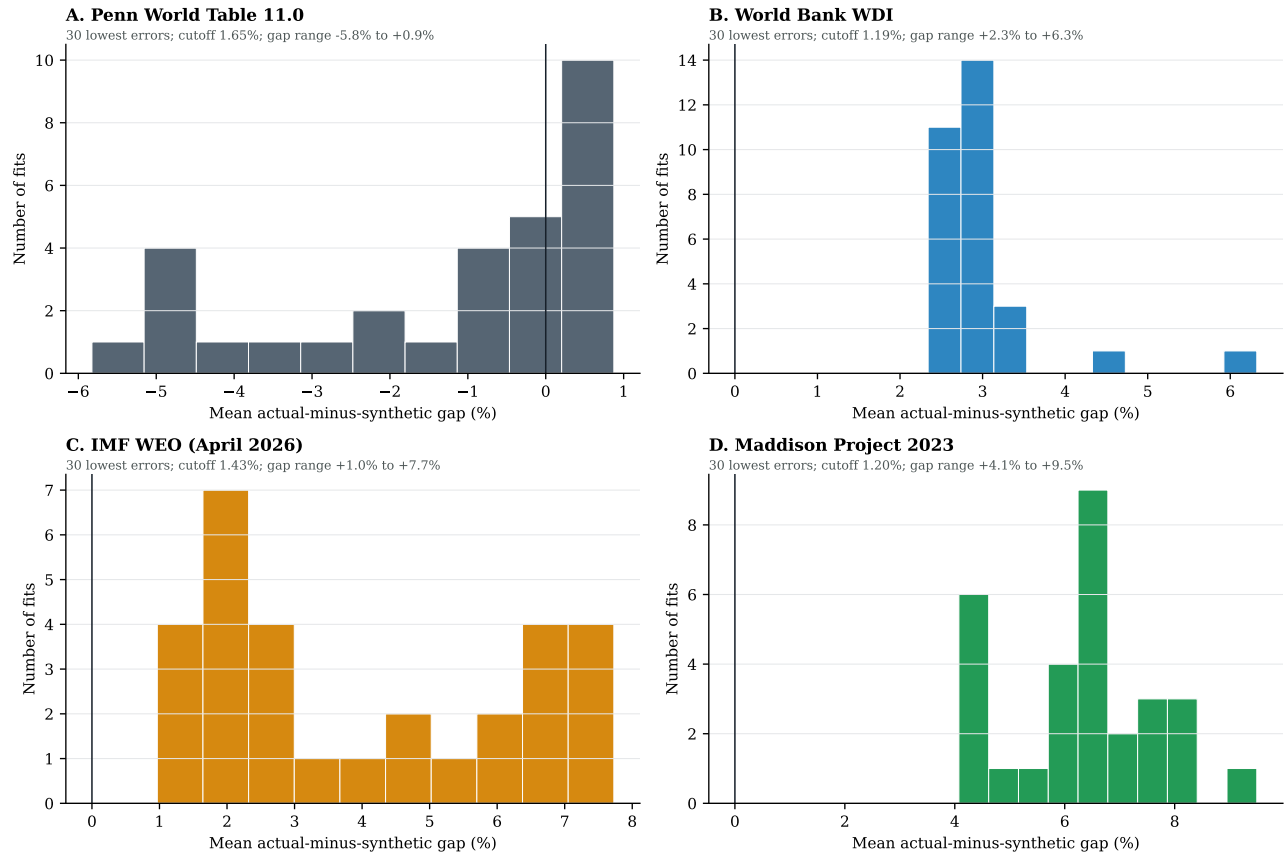


Figure 8: The 30 lowest-error fits within each income dataset under the headline search specification.

B The annual Grierian landscape

For each year we display the best available optimistic India and pessimistic India selected across the four datasets, the dataset-stacked histogram of retained conclusions, and mean gap versus fit error. The last pre-intervention year is normalized to 100 so that different PPP vintages may share a page without requiring a summit on the metaphysics of the international dollar.

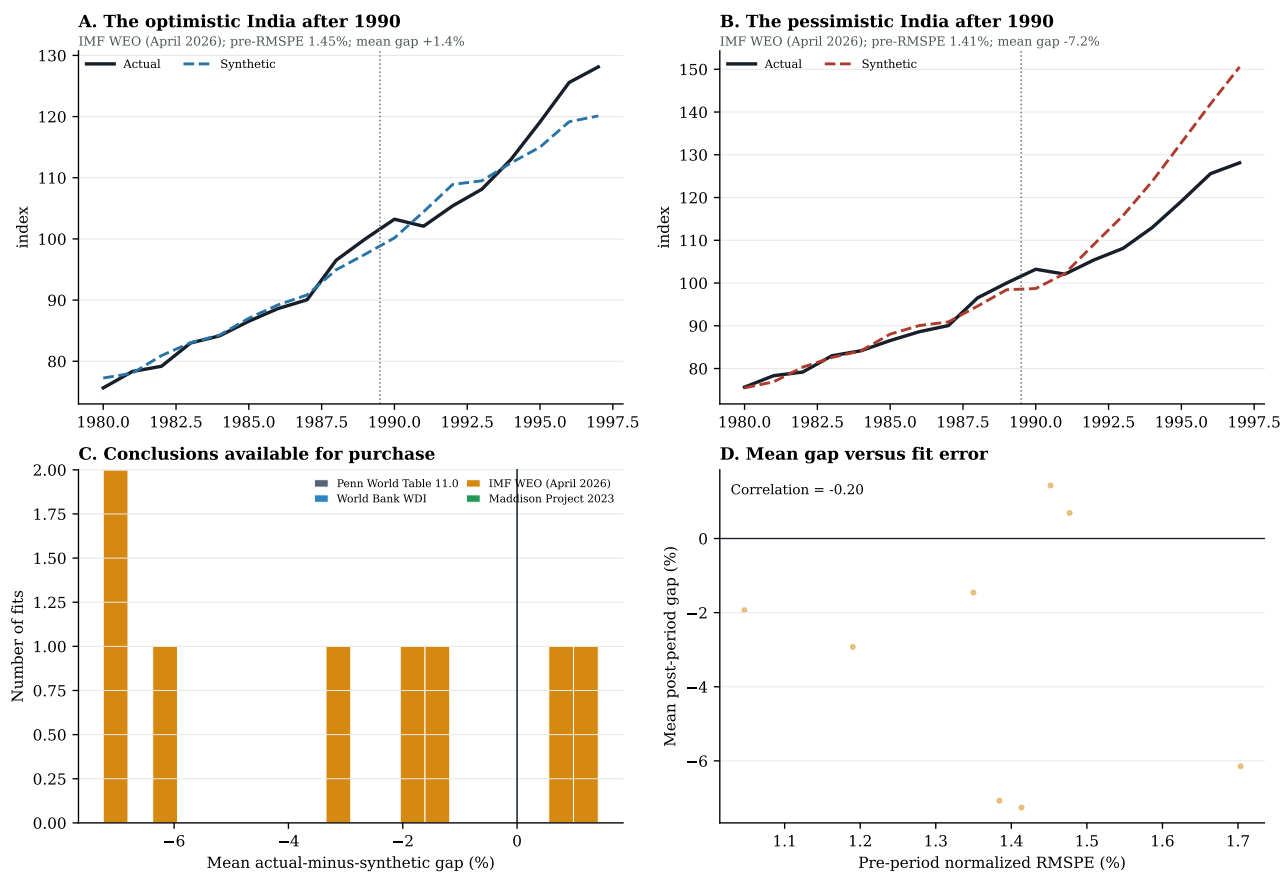


Figure 9: The Indian economy enters two universes after 1990.

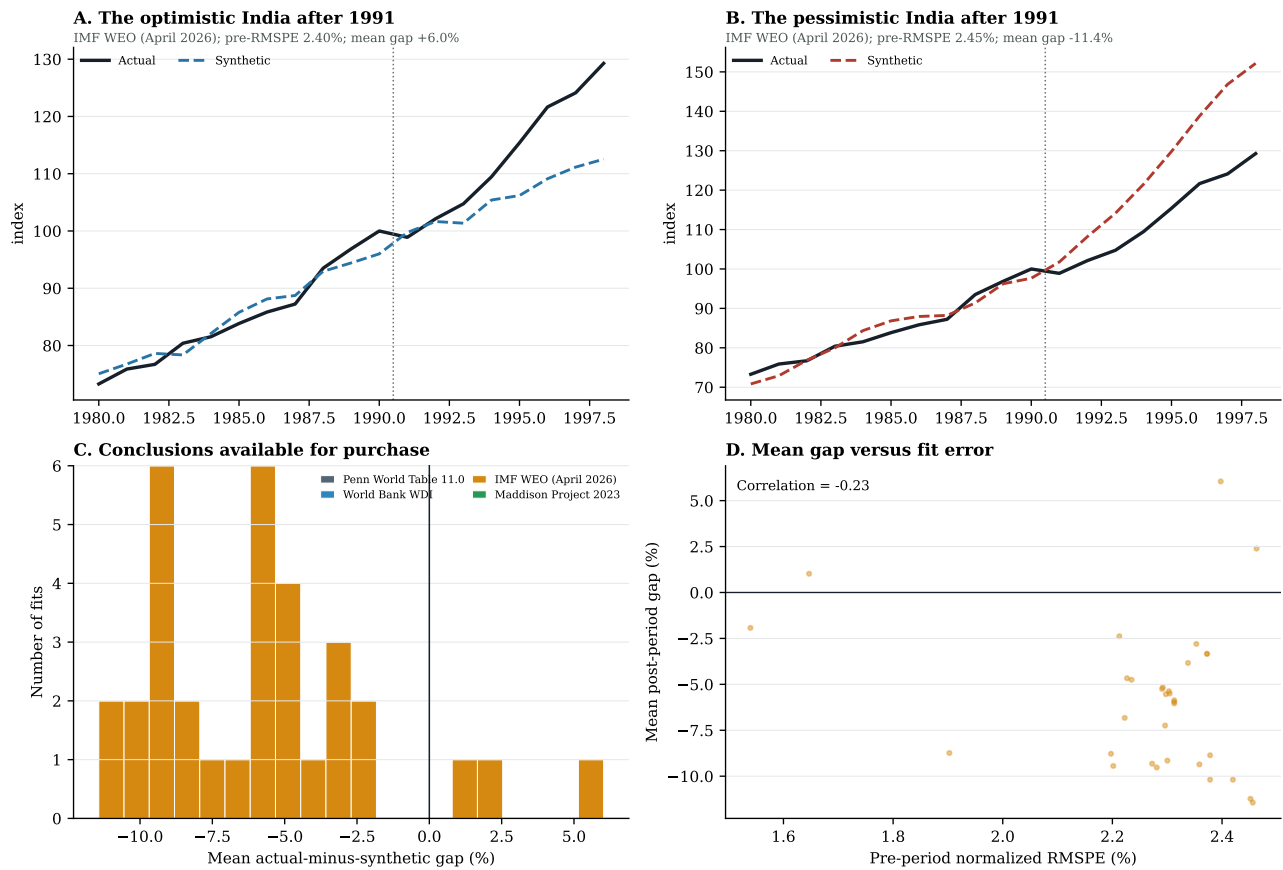


Figure 10: The Indian economy enters two universes after 1991.

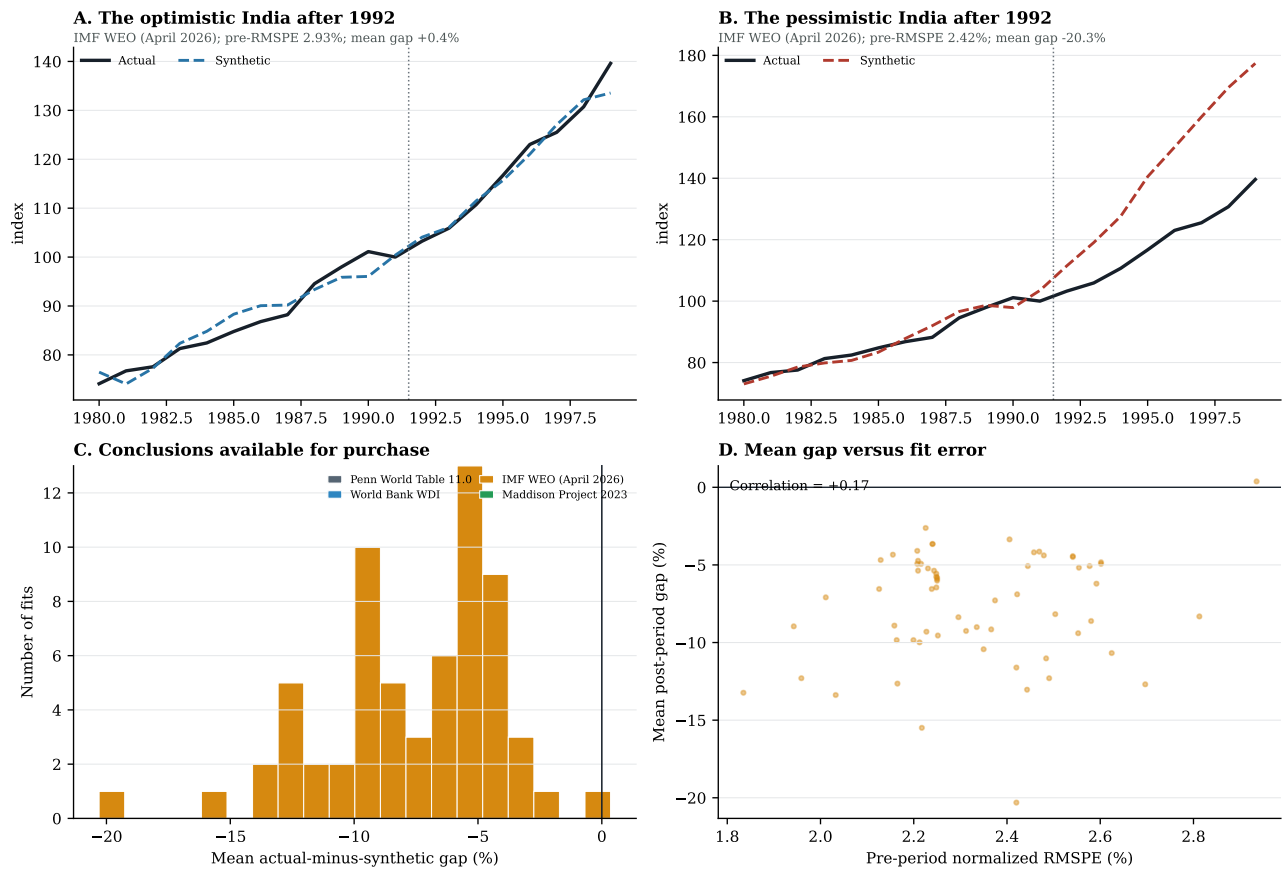


Figure 11: The Indian economy enters two universes after 1992.

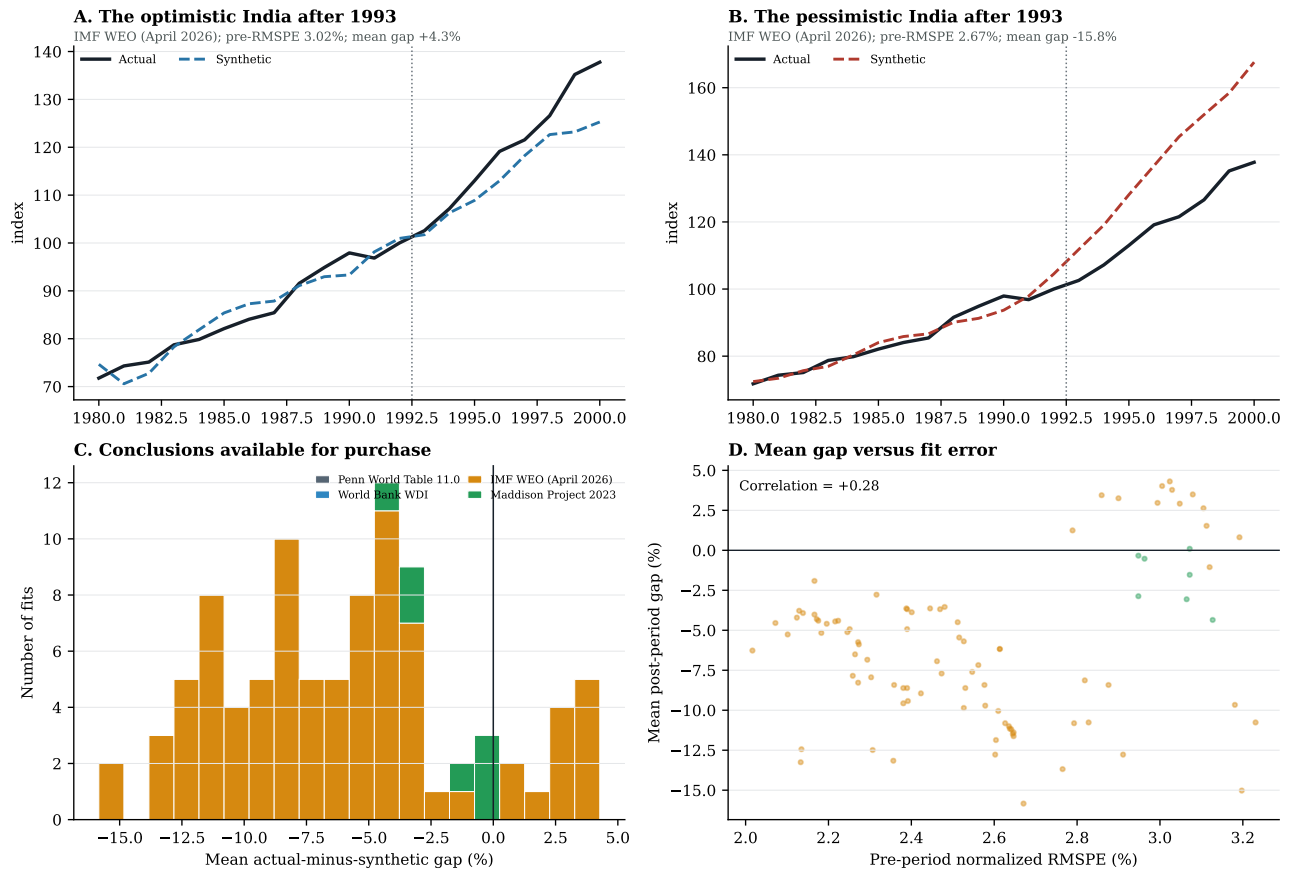


Figure 12: The Indian economy enters two universes after 1993.

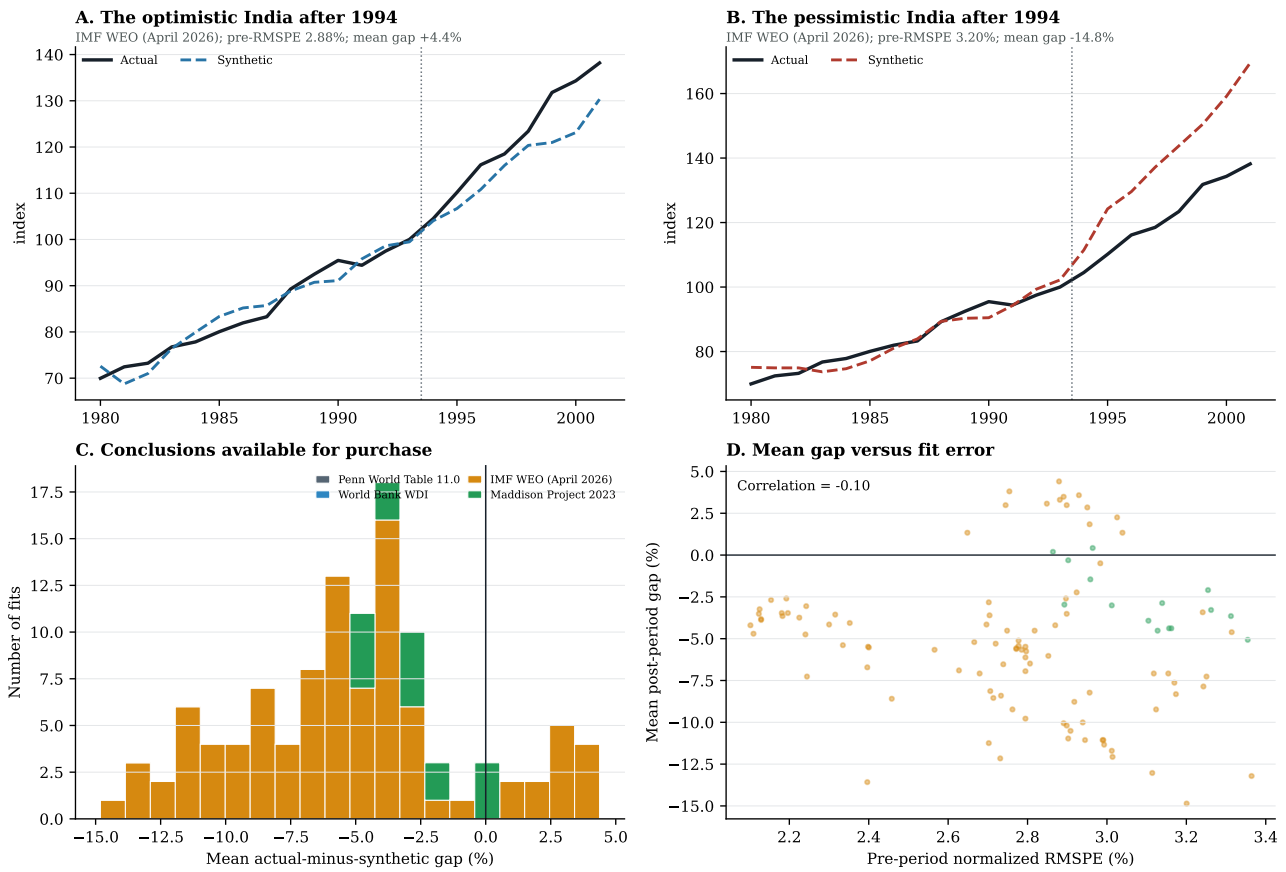


Figure 13: The Indian economy enters two universes after 1994.

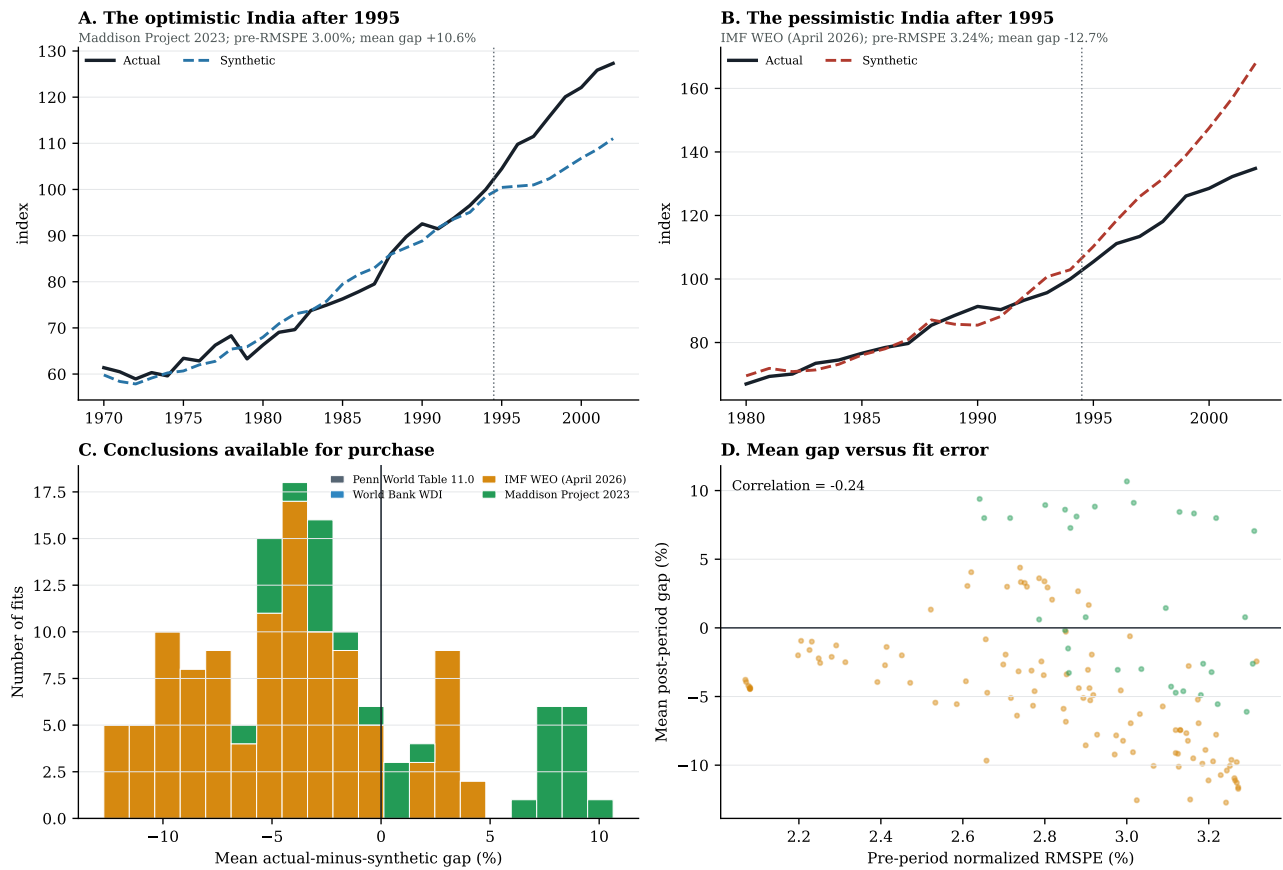


Figure 14: The Indian economy enters two universes after 1995.

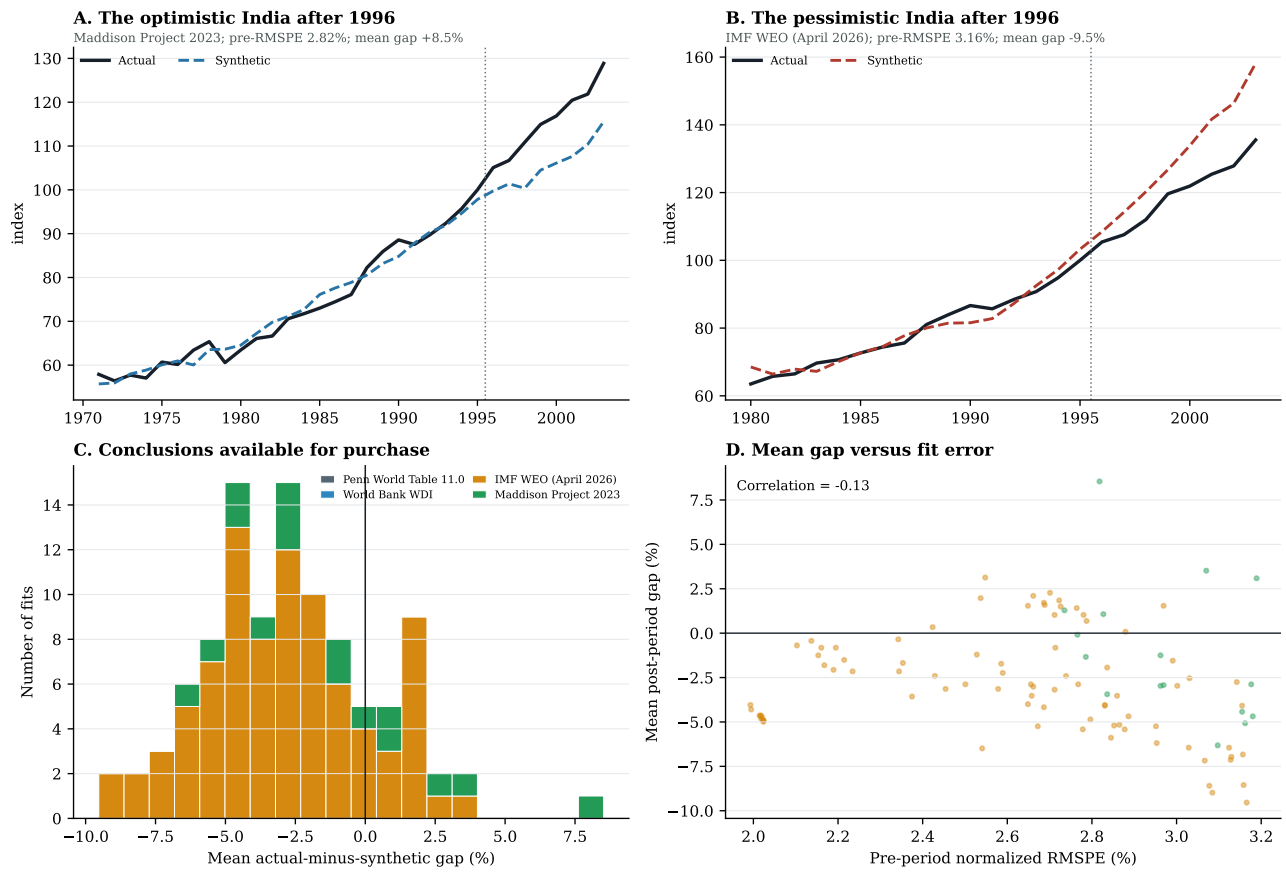


Figure 15: The Indian economy enters two universes after 1996.

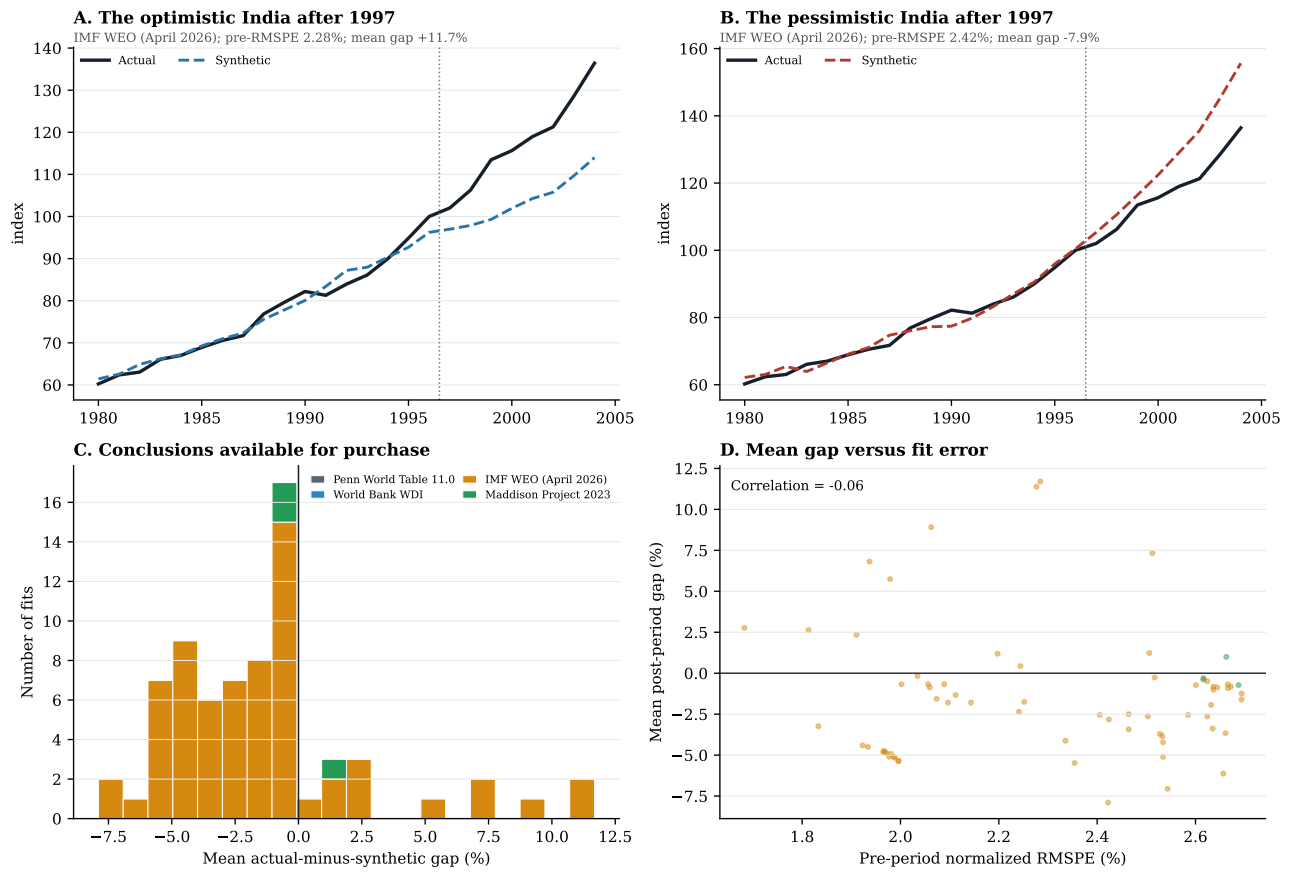


Figure 16: The Indian economy enters two universes after 1997.

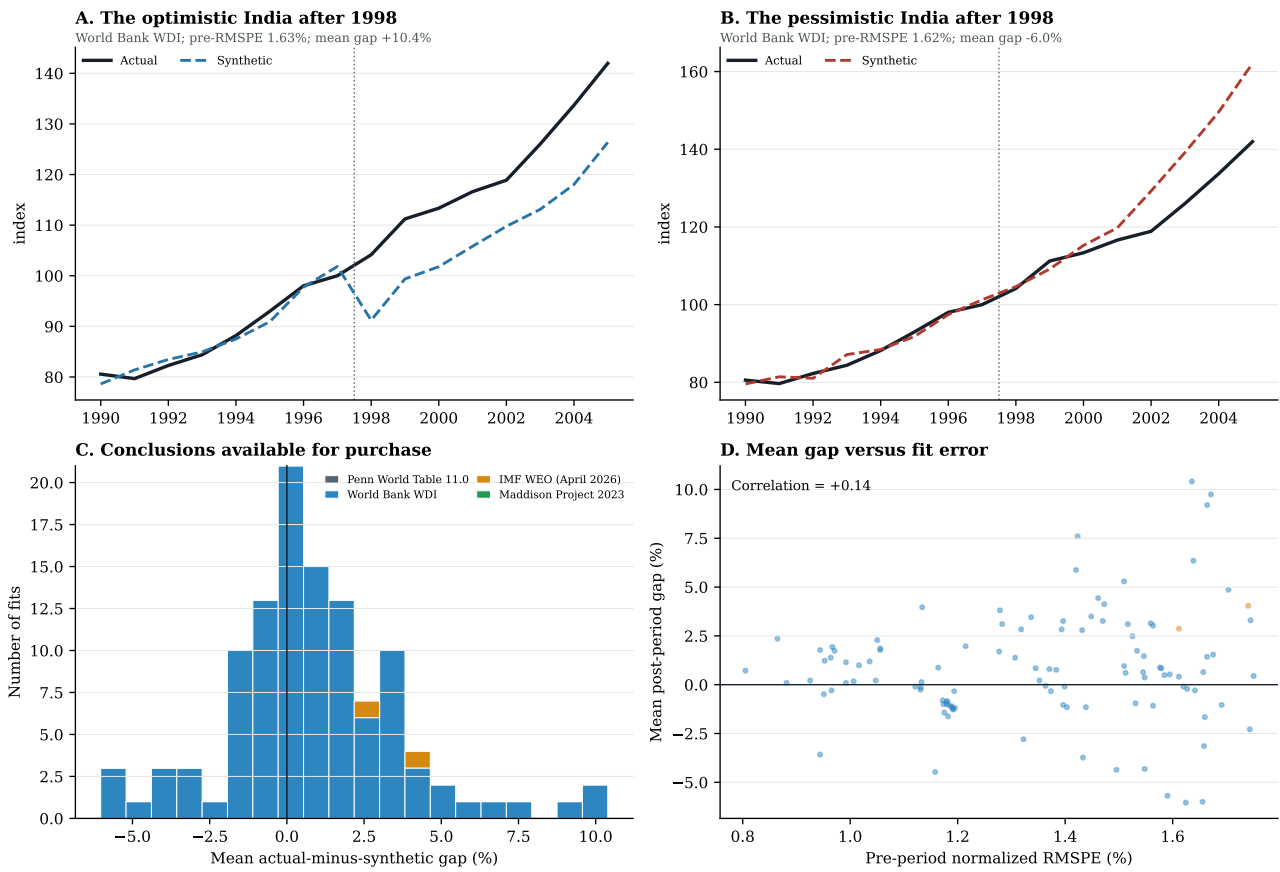


Figure 17: The Indian economy enters two universes after 1998.

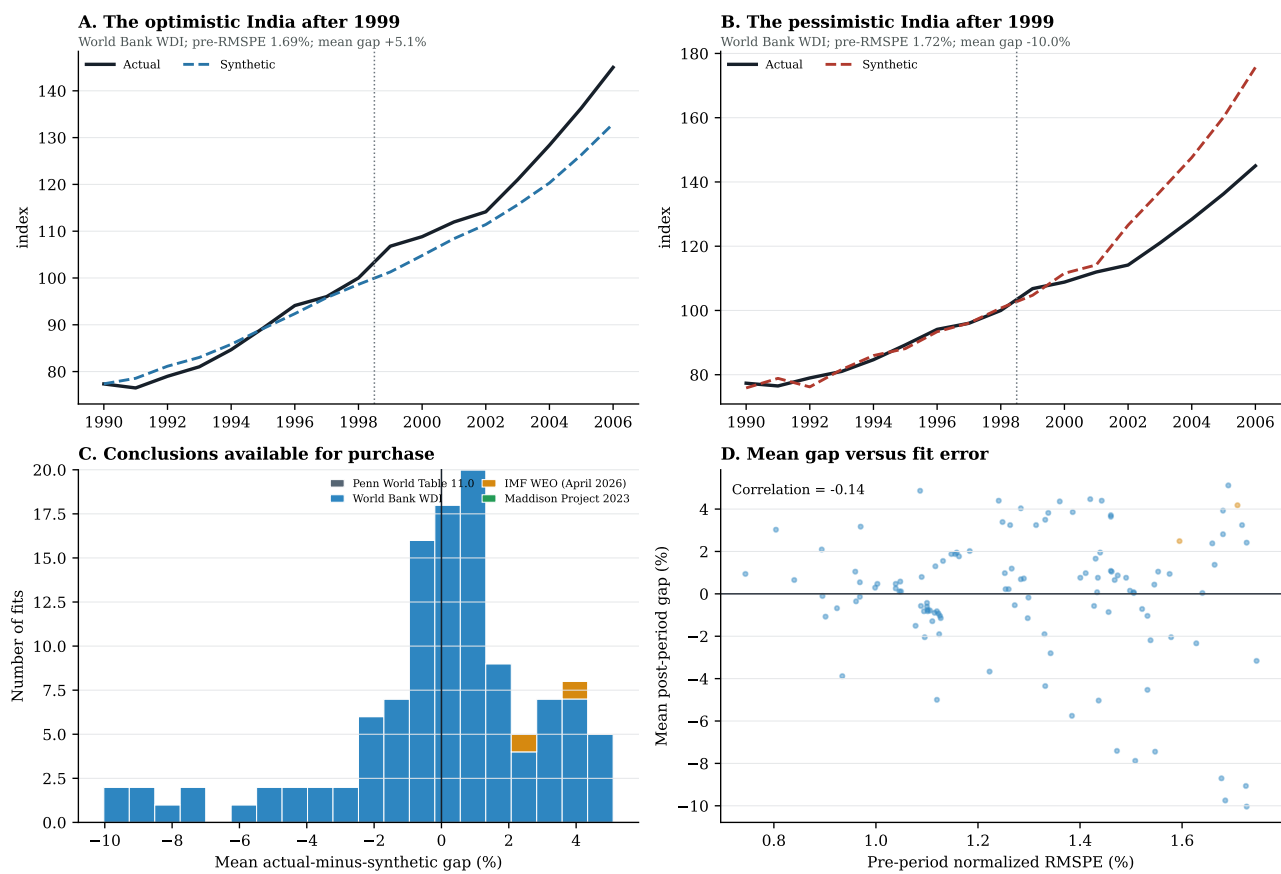


Figure 18: The Indian economy enters two universes after 1999.

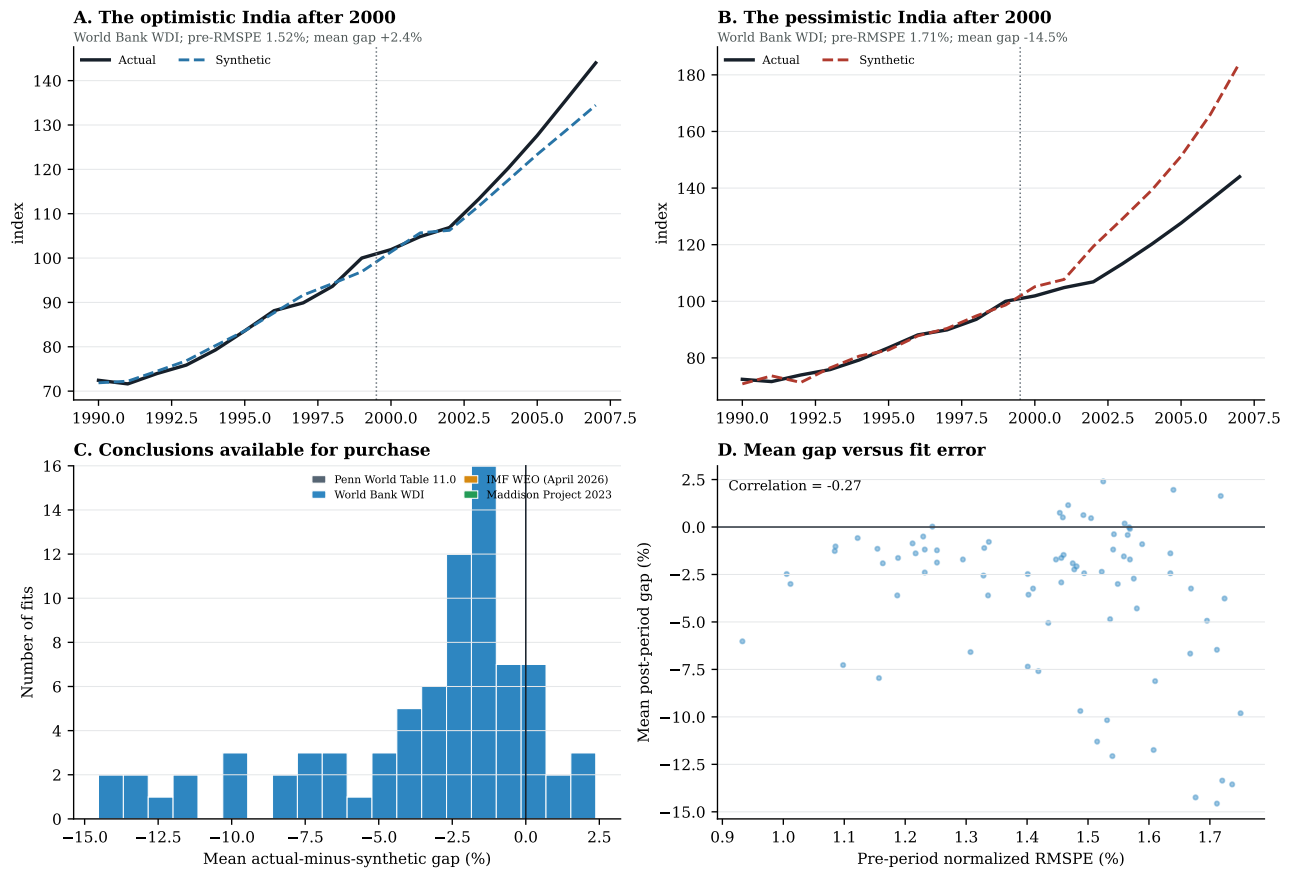


Figure 19: The Indian economy enters two universes after 2000.

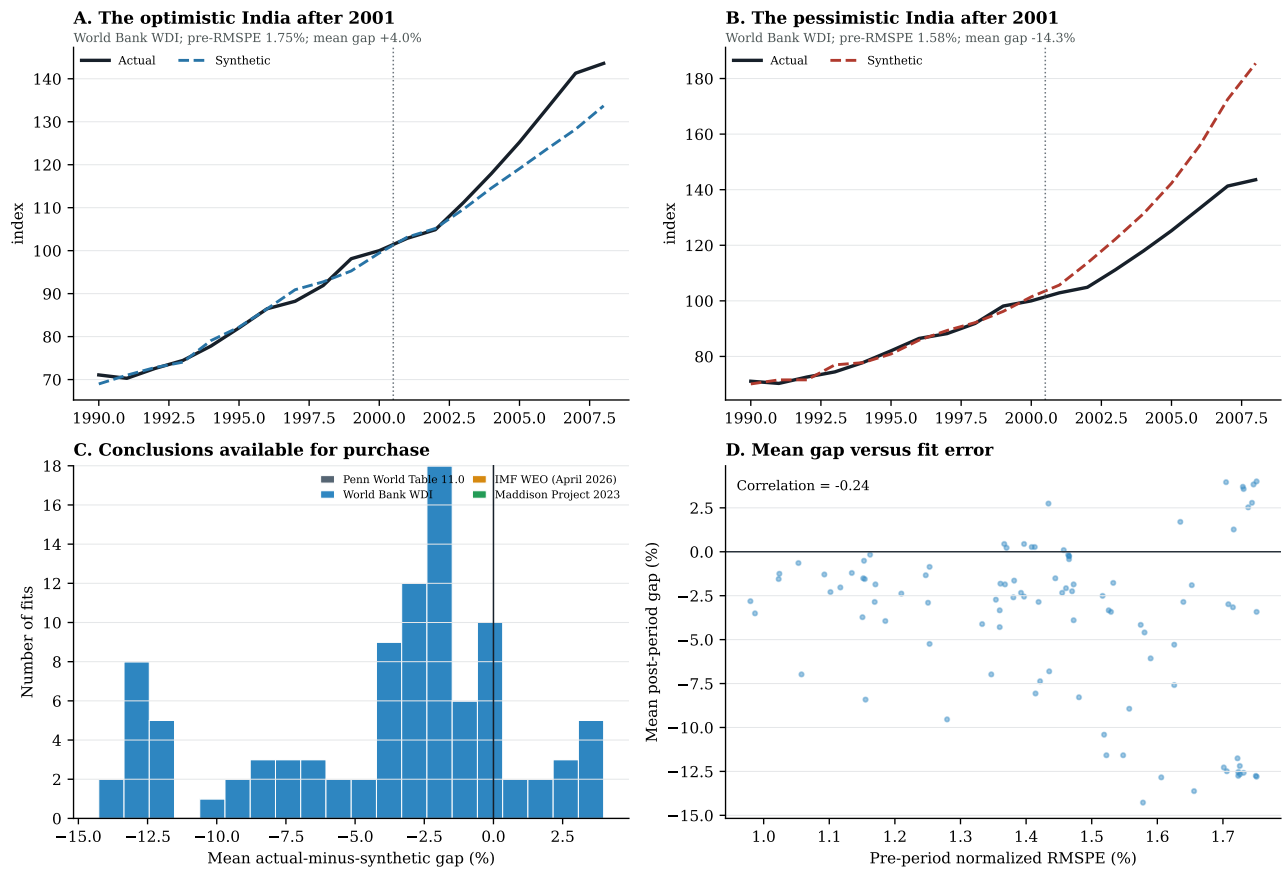


Figure 20: The Indian economy enters two universes after 2001.

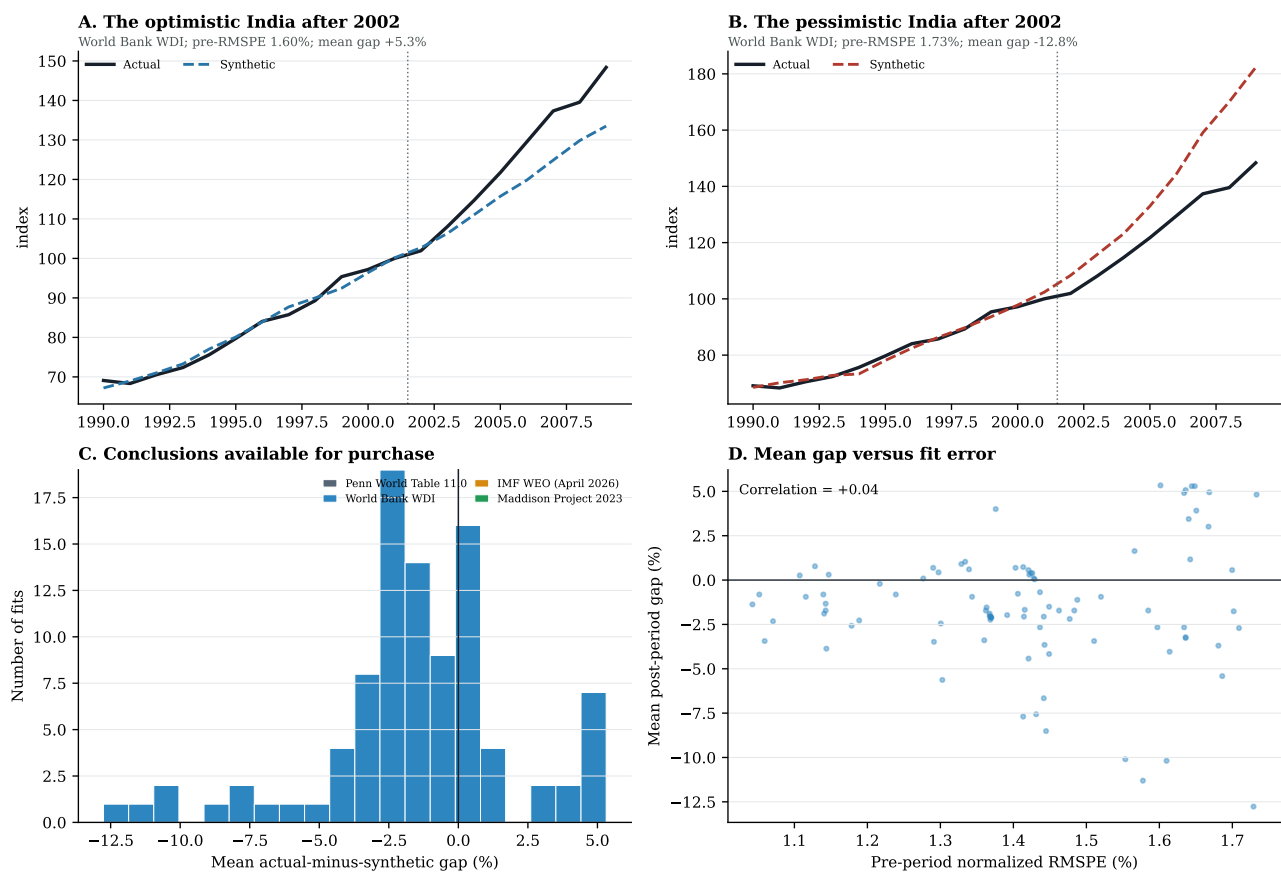


Figure 21: The Indian economy enters two universes after 2002.

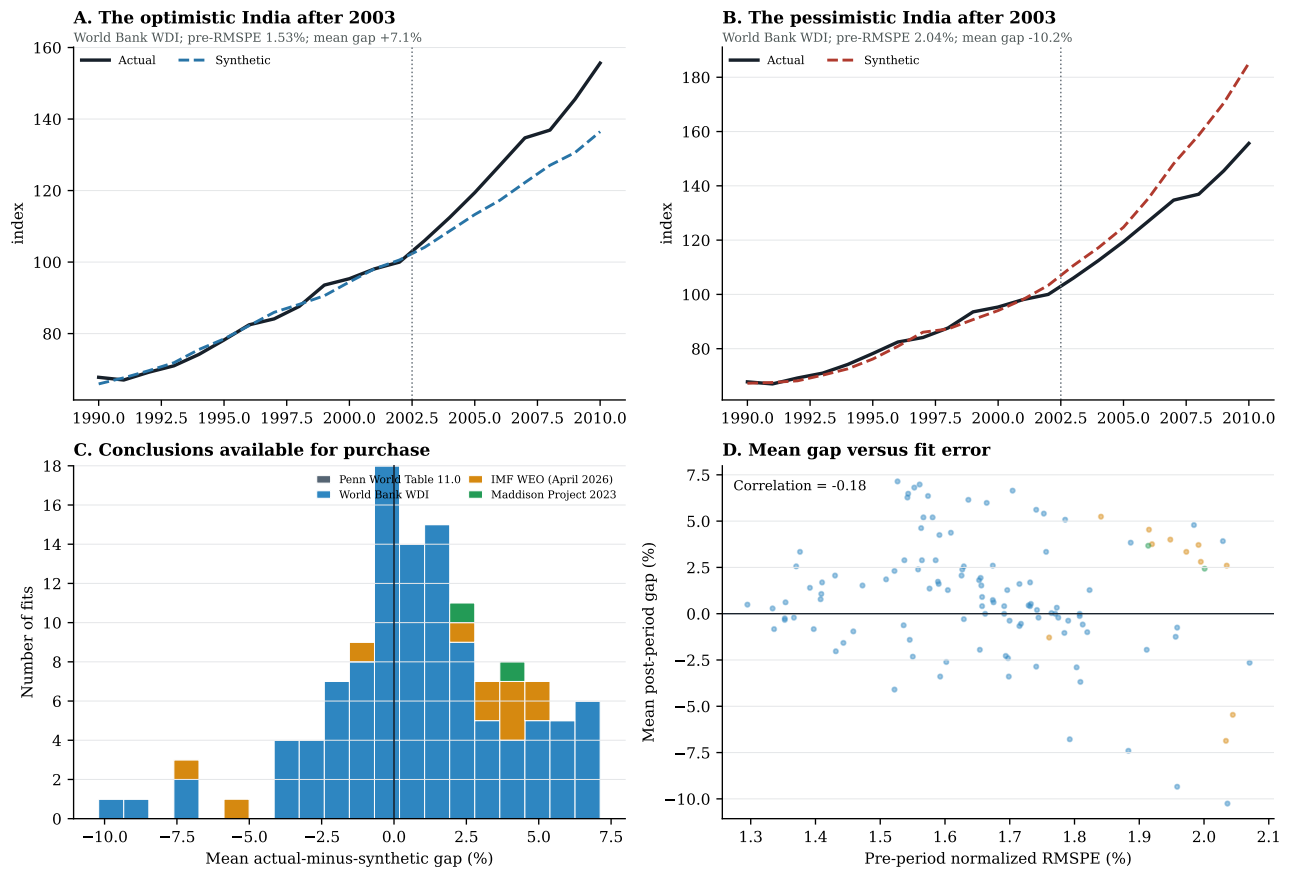


Figure 22: The Indian economy enters two universes after 2003.

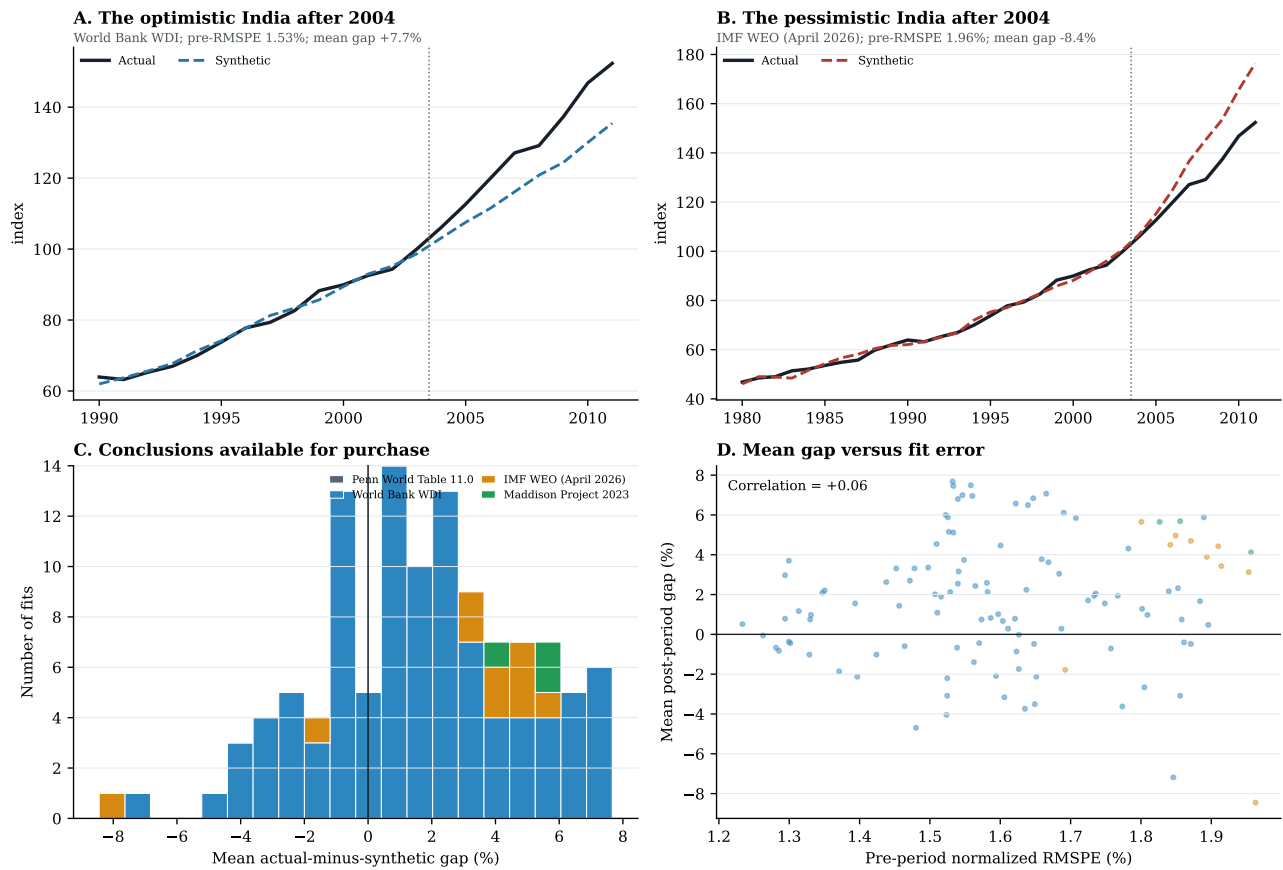


Figure 23: The Indian economy enters two universes after 2004.

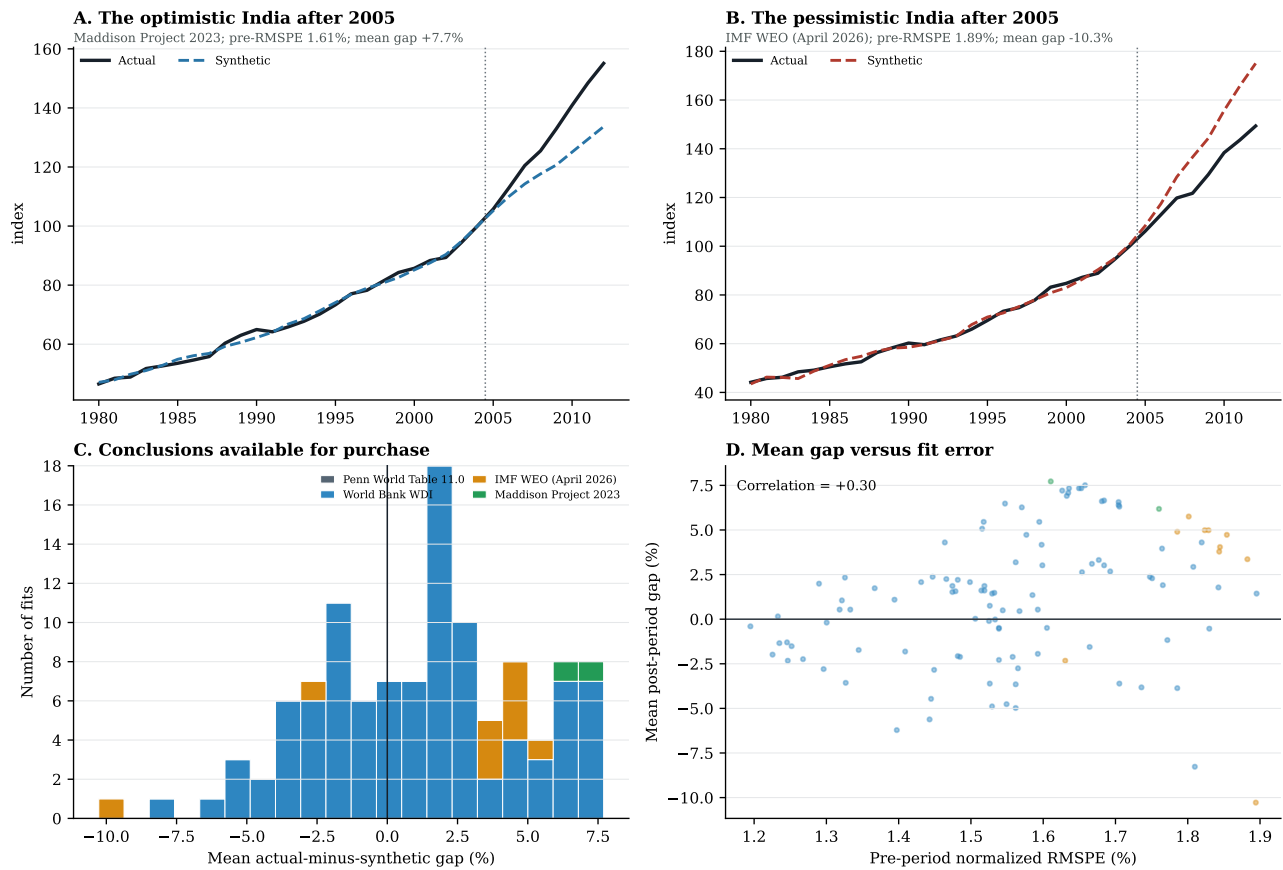


Figure 24: The Indian economy enters two universes after 2005.

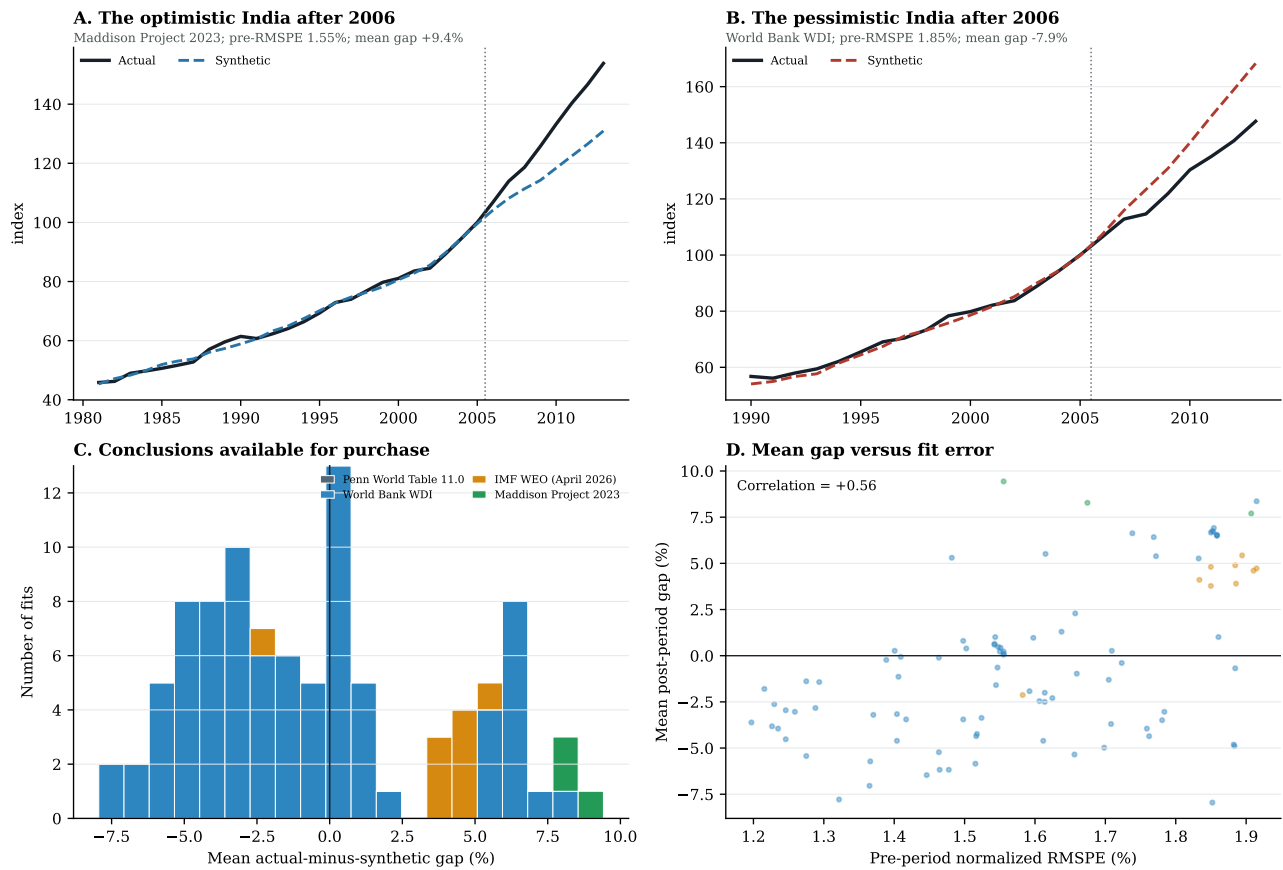


Figure 25: The Indian economy enters two universes after 2006.

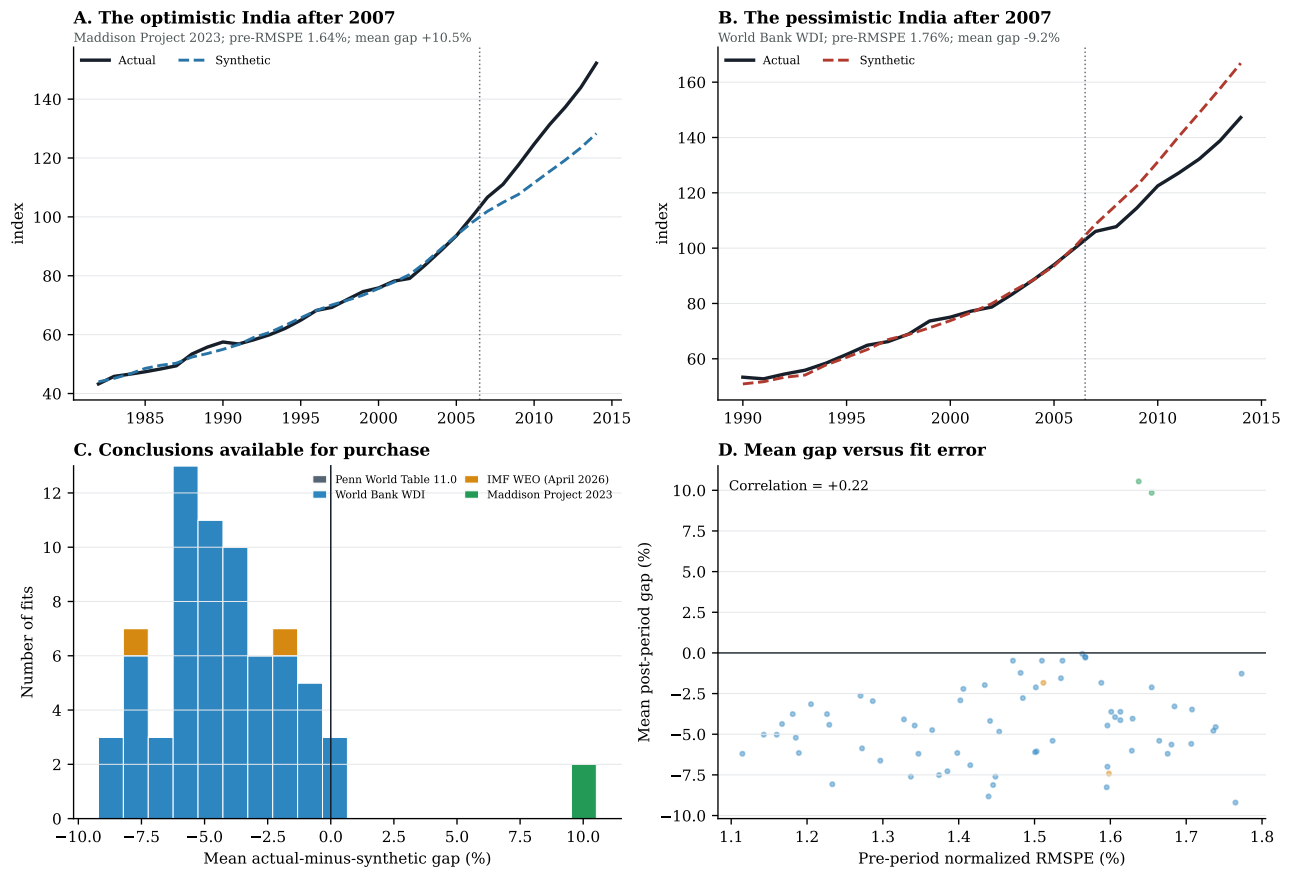


Figure 26: The Indian economy enters two universes after 2007.

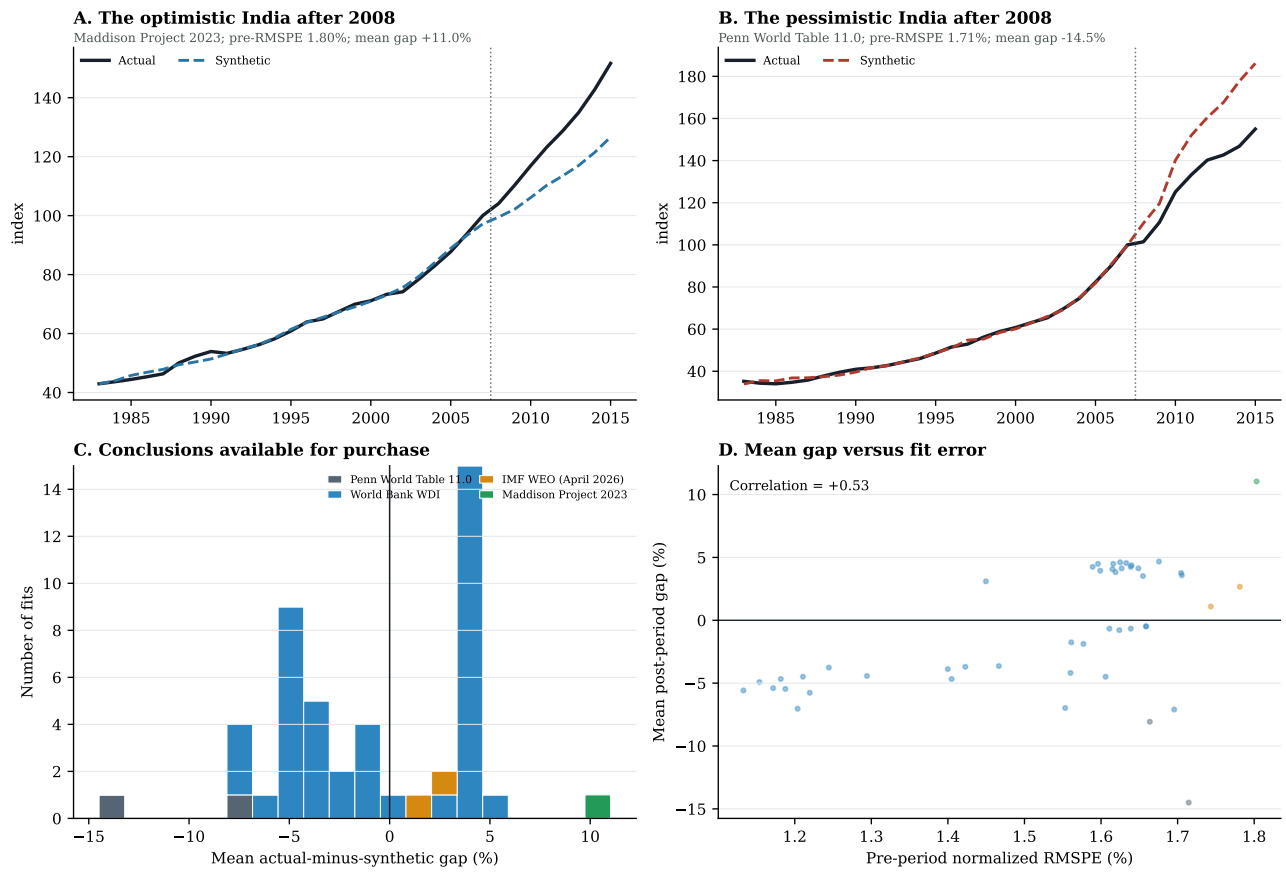


Figure 27: The Indian economy enters two universes after 2008.

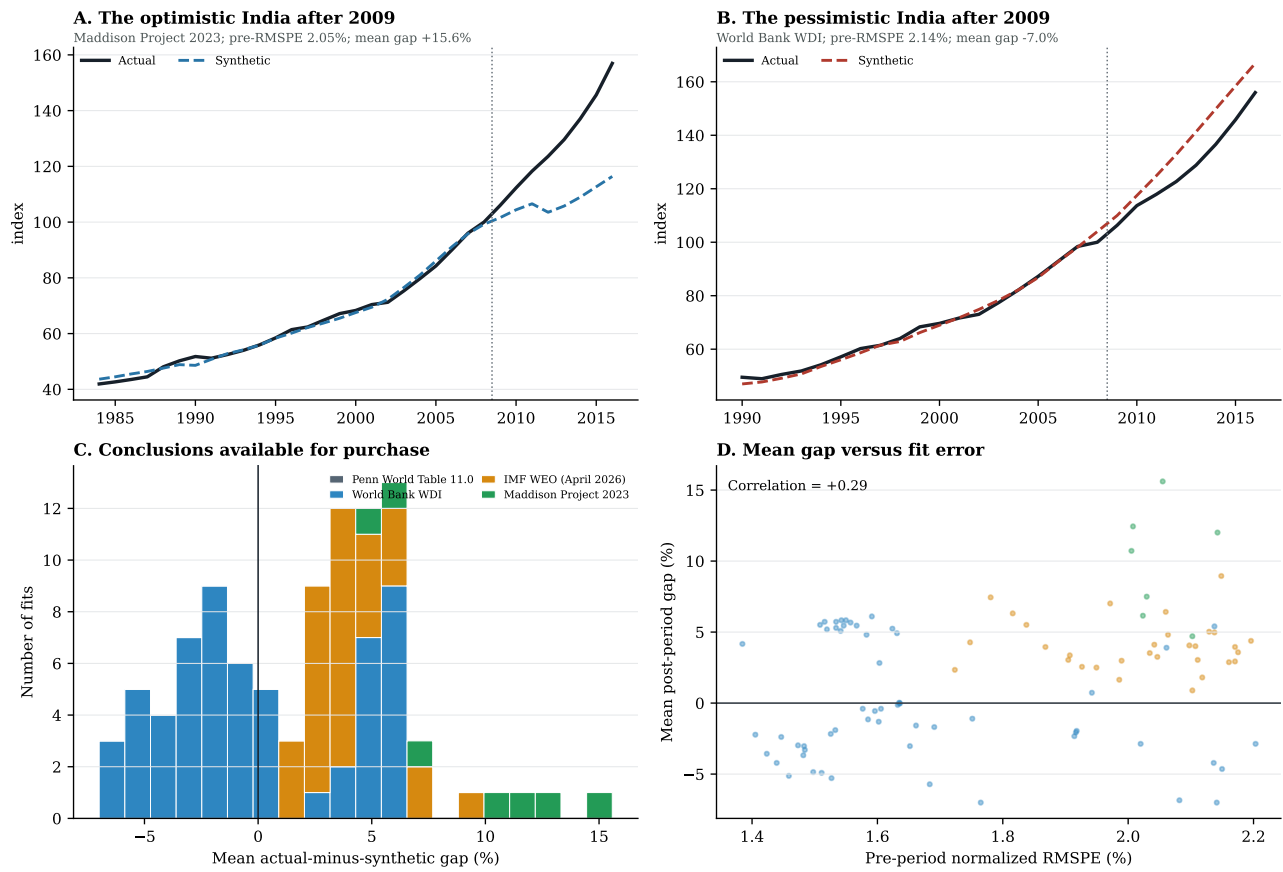


Figure 28: The Indian economy enters two universes after 2009.

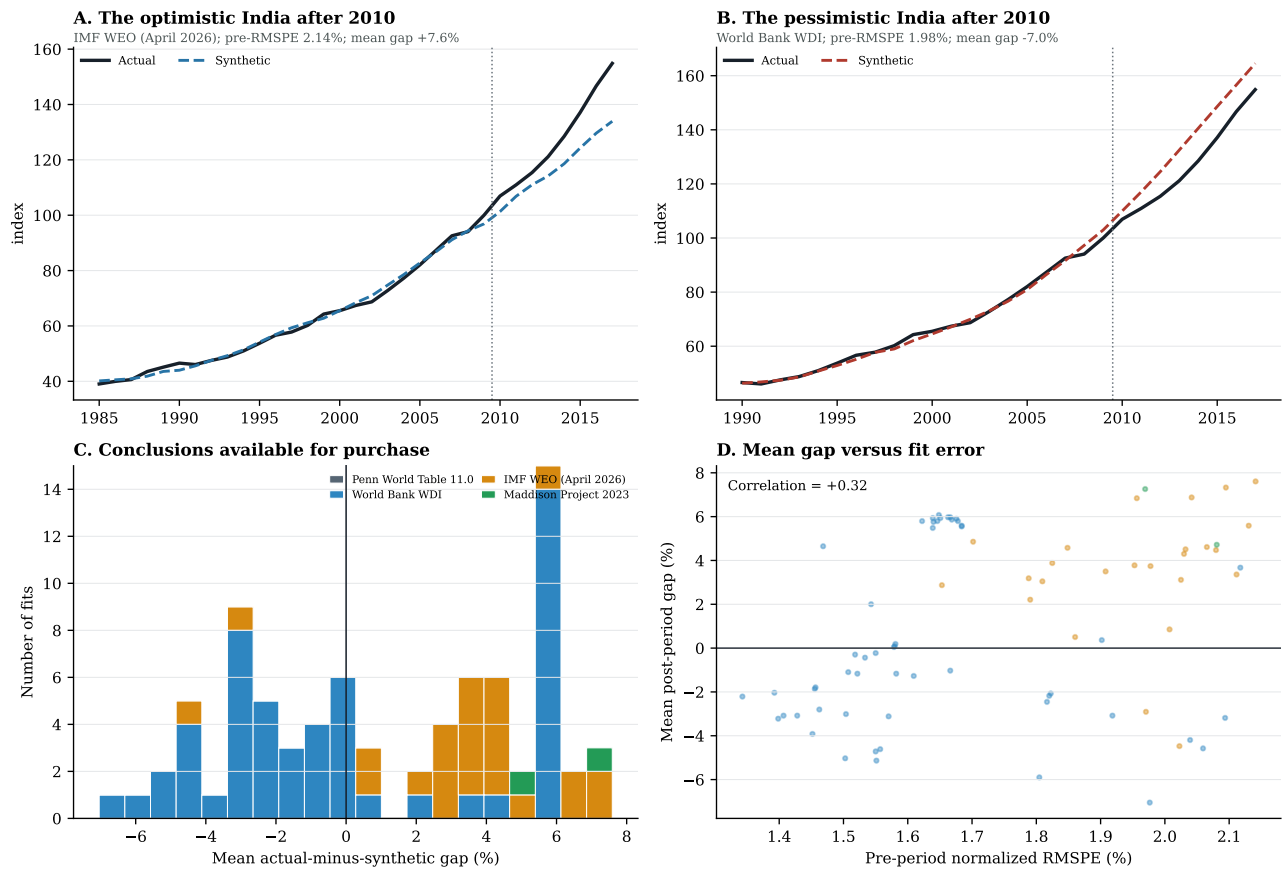


Figure 29: The Indian economy enters two universes after 2010.

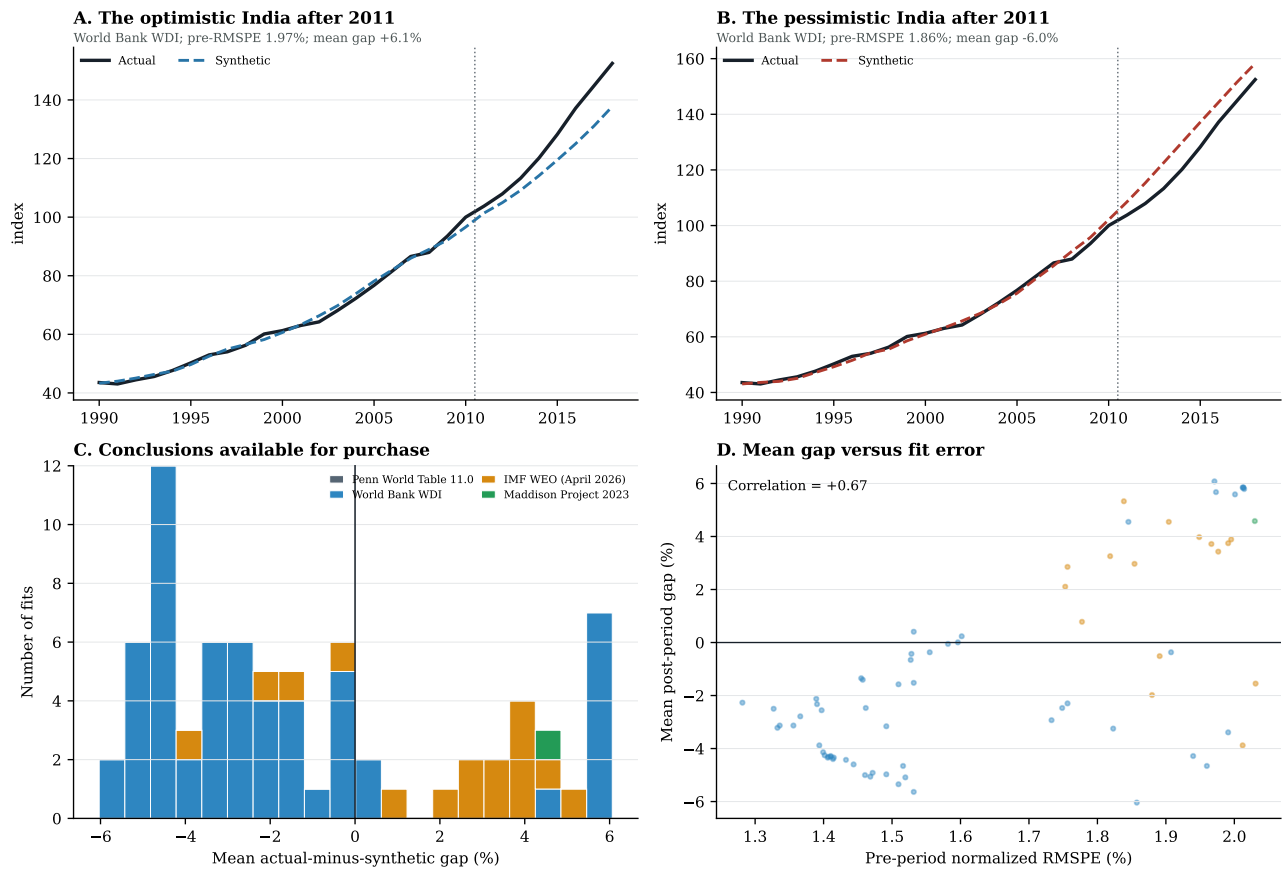


Figure 30: The Indian economy enters two universes after 2011.

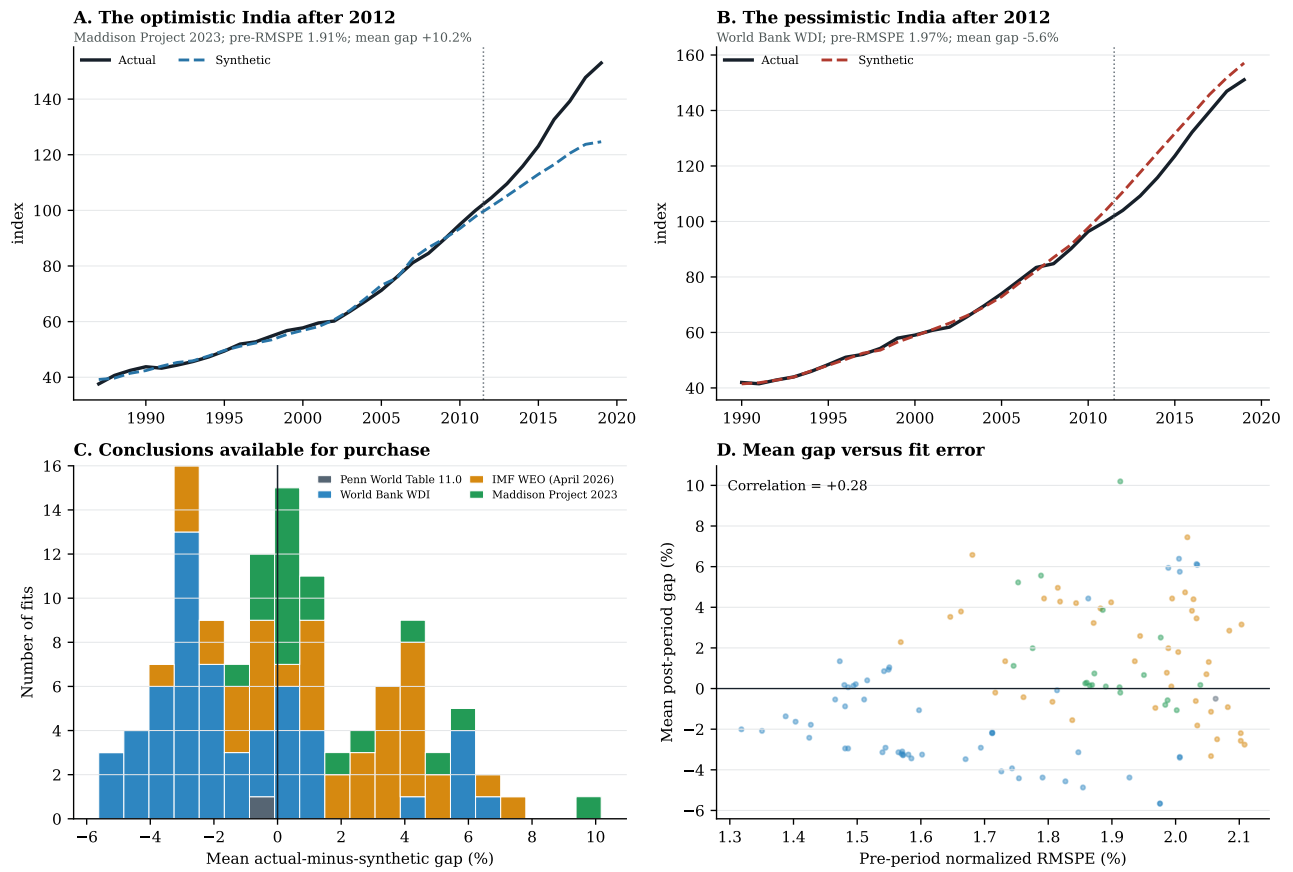


Figure 31: The Indian economy enters two universes after 2012.

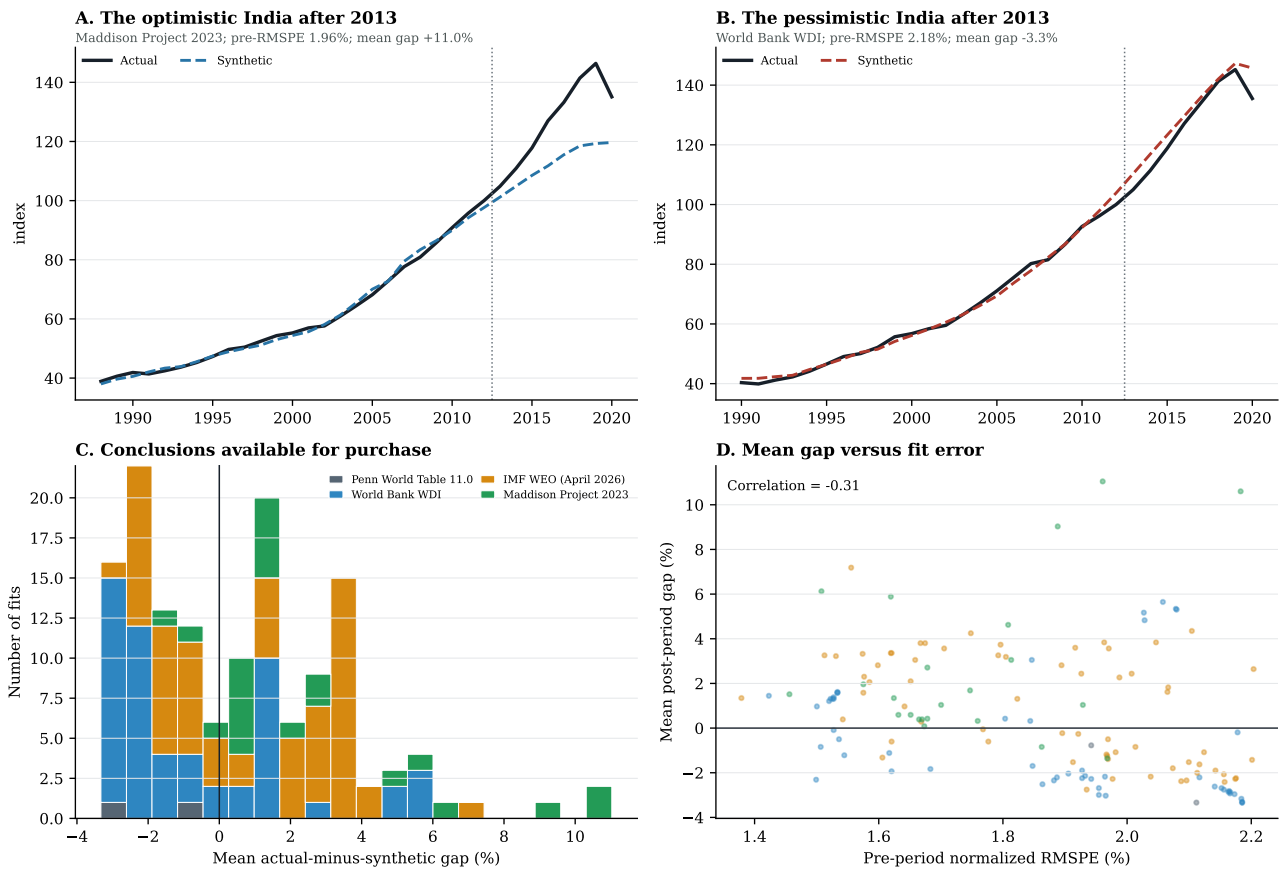


Figure 32: The Indian economy enters two universes after 2013.

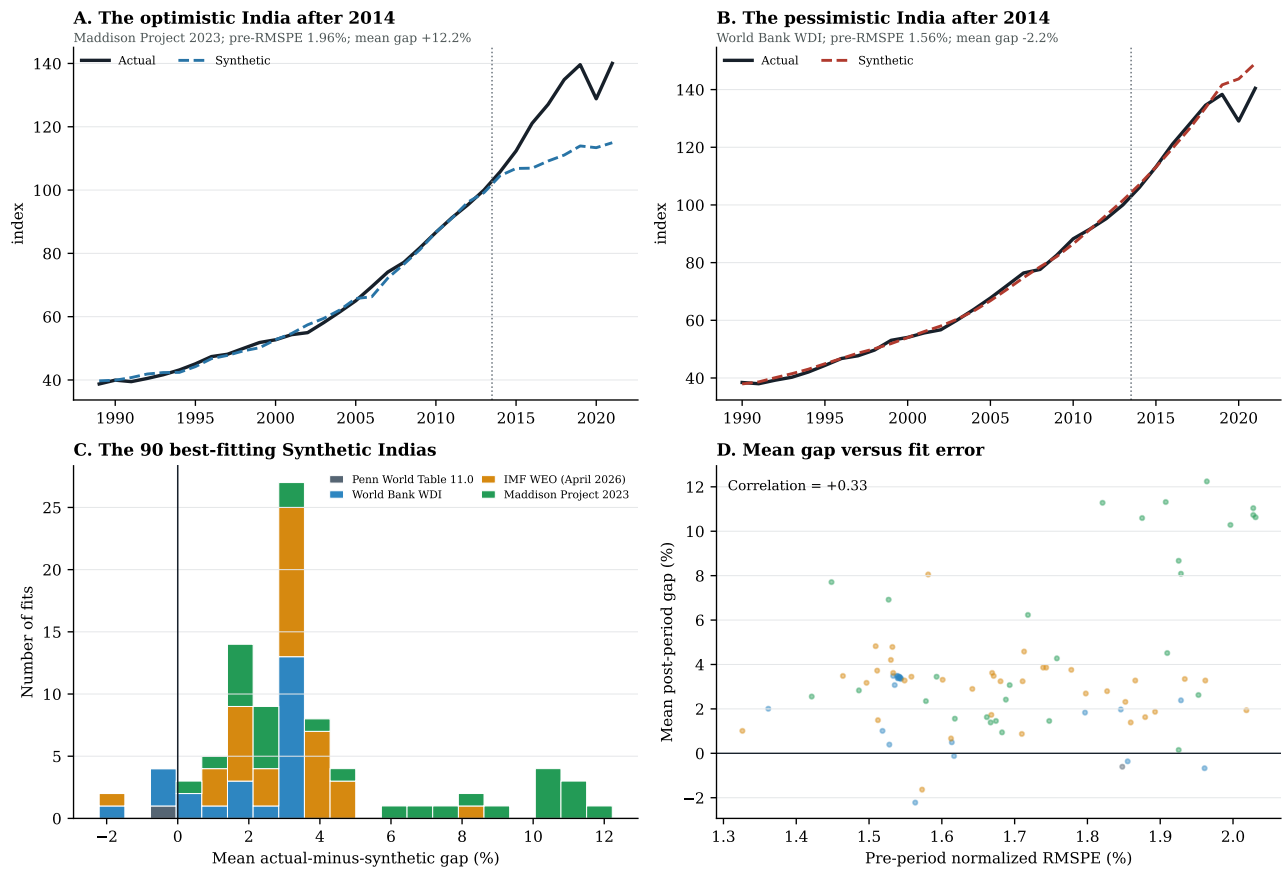


Figure 33: The Indian economy enters two universes after 2014.

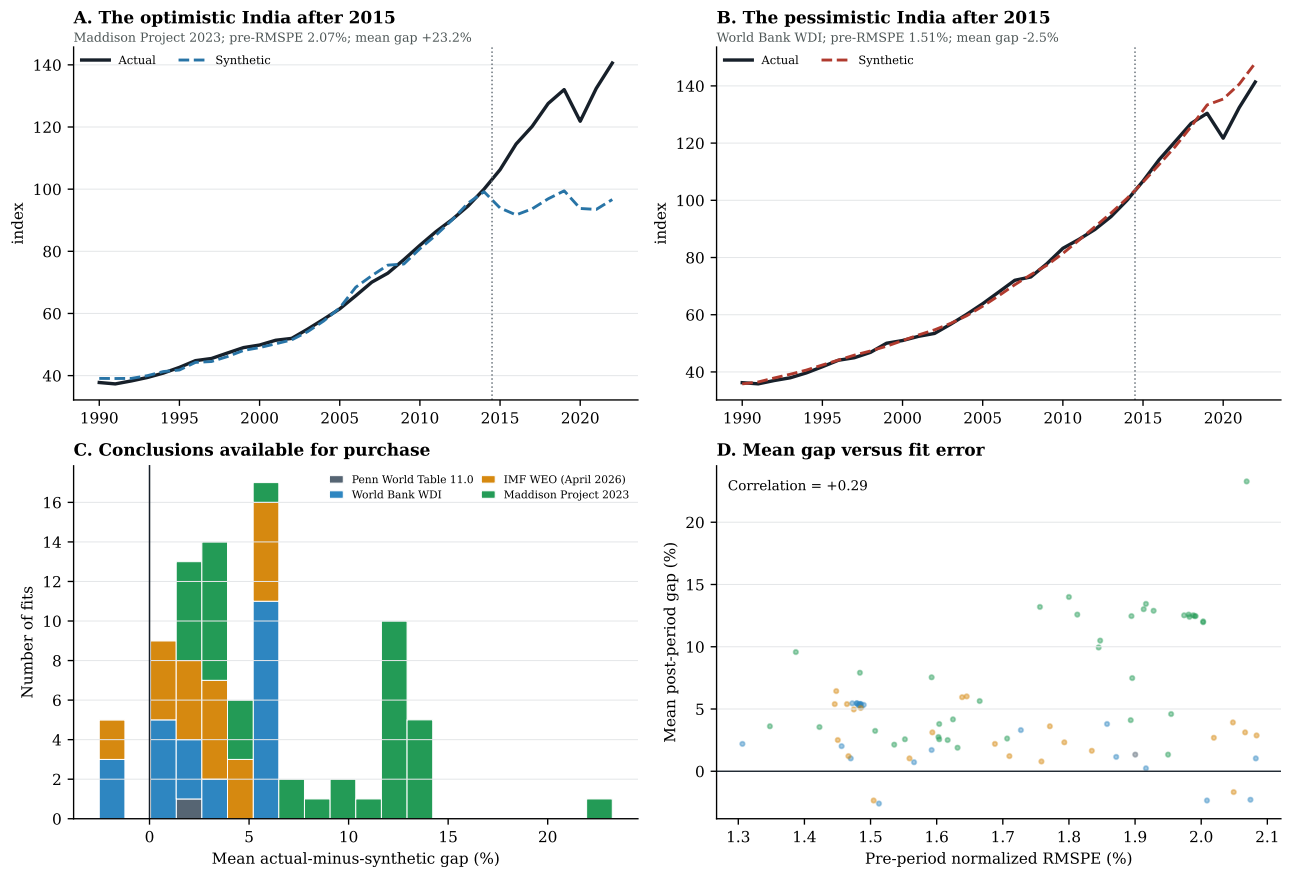


Figure 34: The Indian economy enters two universes after 2015.



Figure 35: The Indian economy enters two universes after 2016.

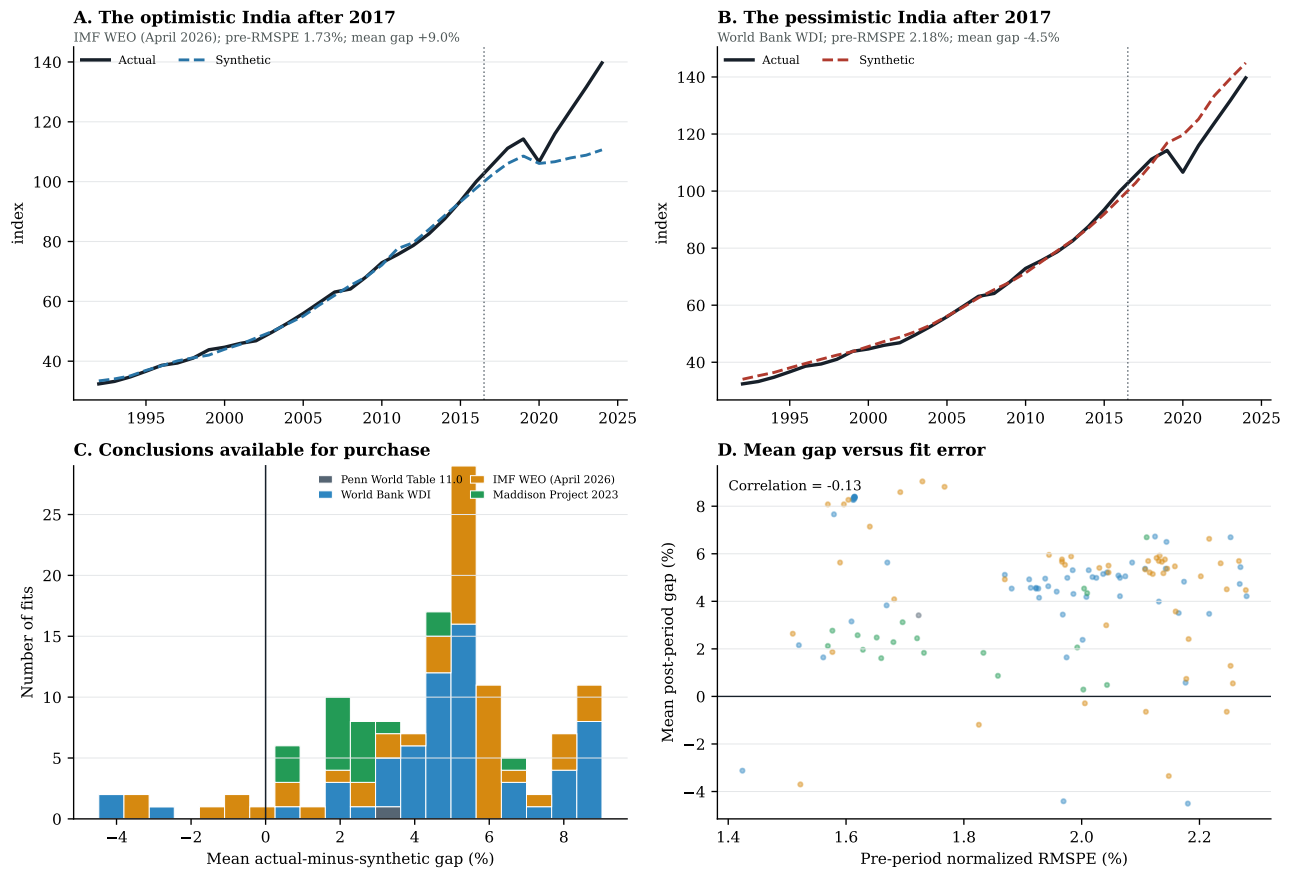


Figure 36: The Indian economy enters two universes after 2017.

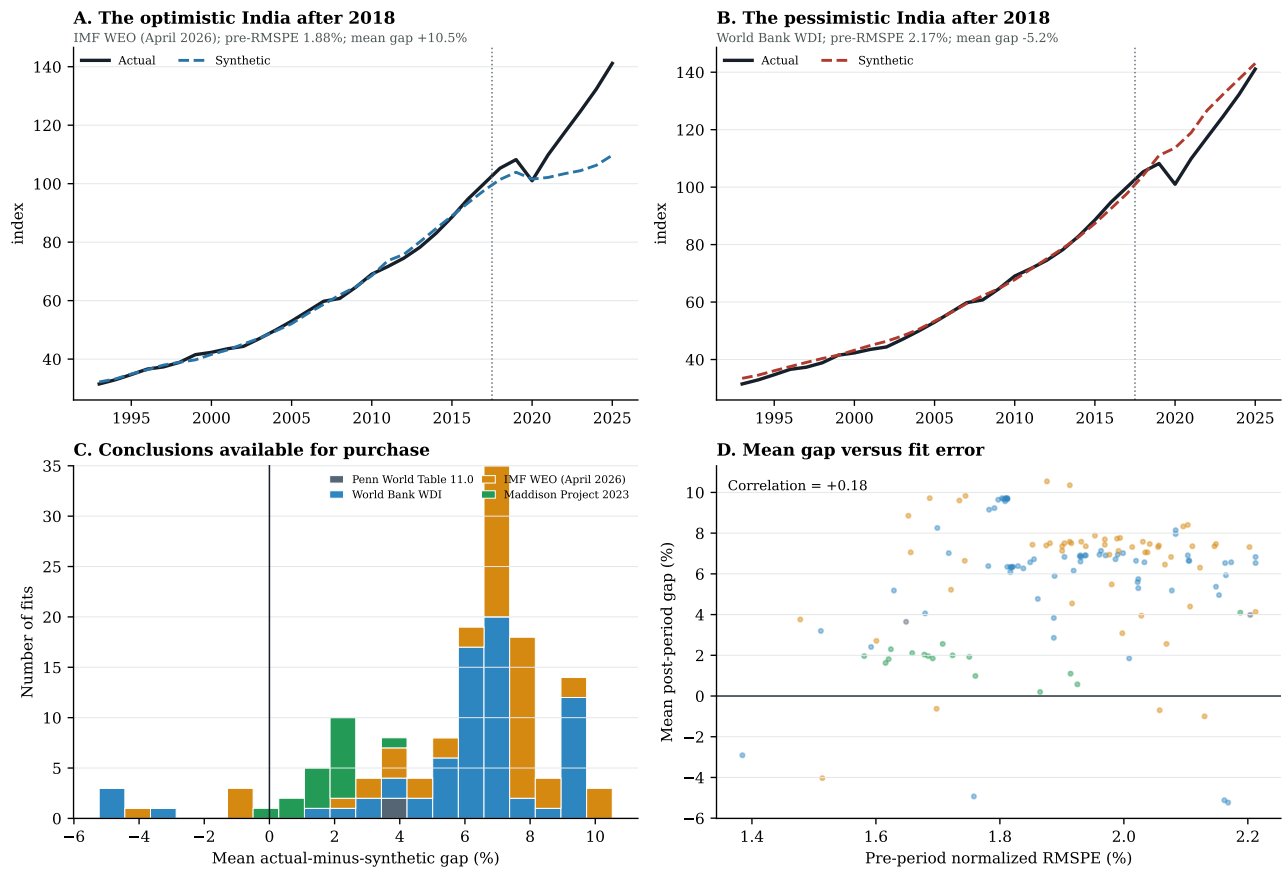


Figure 37: The Indian economy enters two universes after 2018.

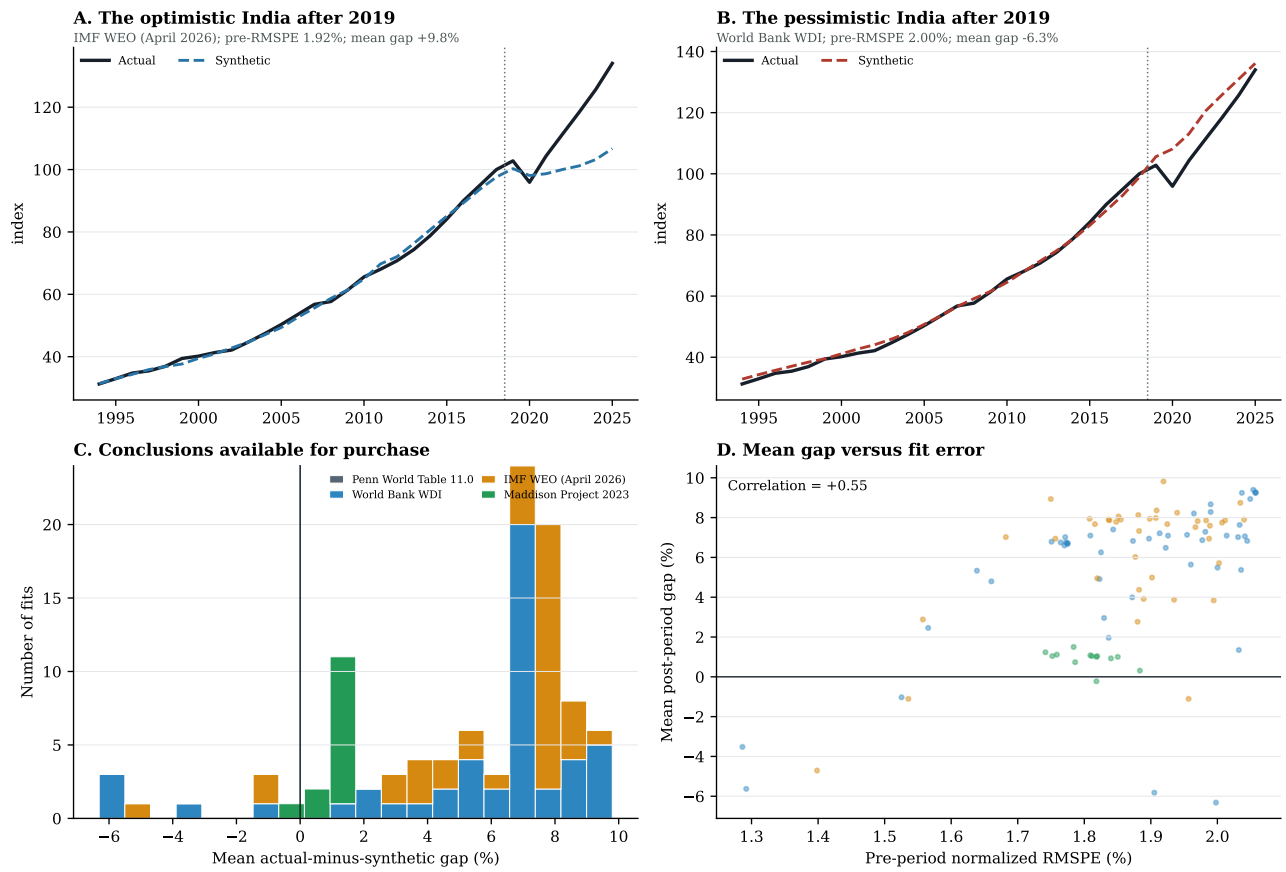


Figure 38: The Indian economy enters two universes after 2019.

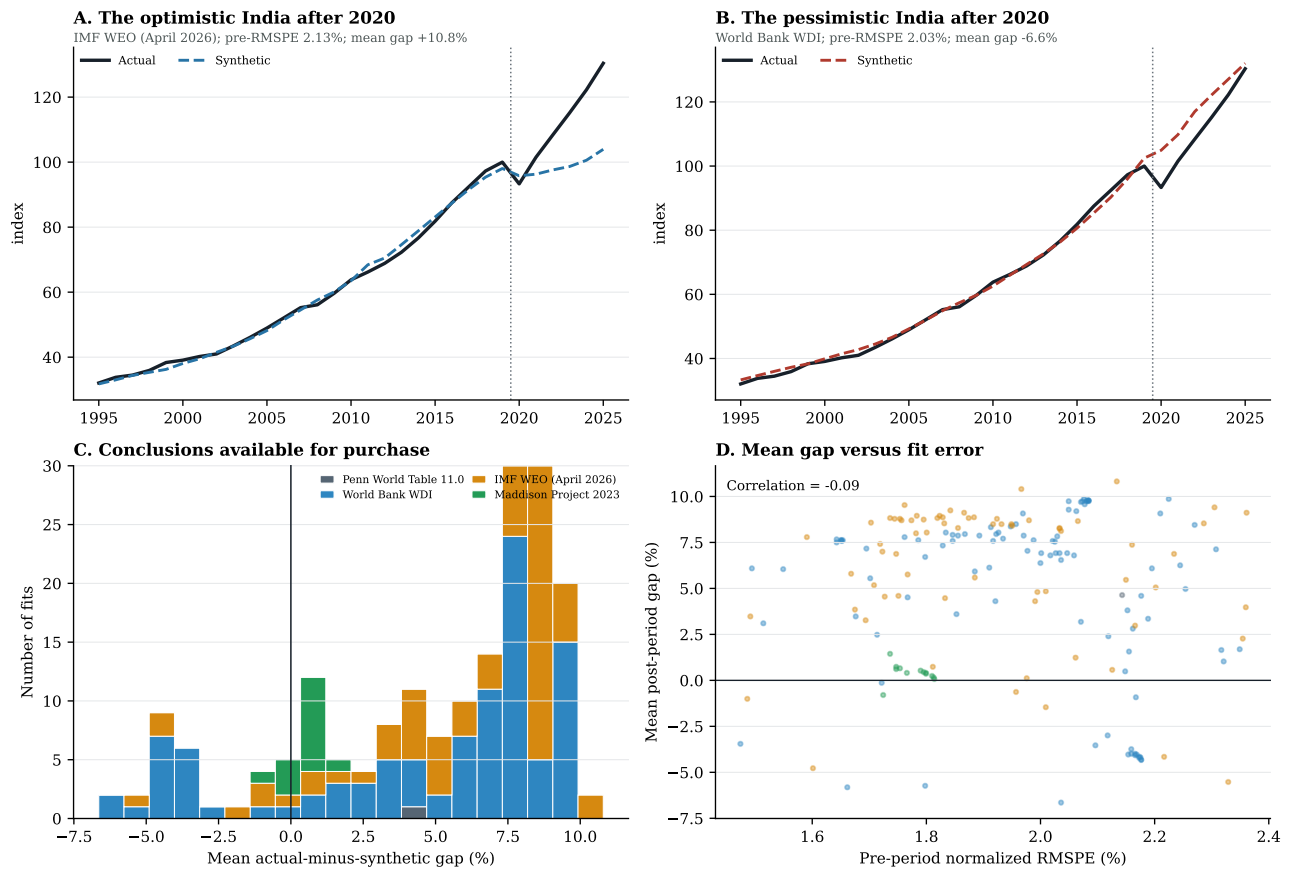


Figure 39: The Indian economy enters two universes after 2020.

References

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