



THE DEVELOPMENT OF THE BANK OF THAILAND'S RESIDENTIAL PROPERTY PRICE INDEX (RPPI)



Mr. Kiattikhun Samritpiam

Miss Poontharik Chongprasoplarp

Data Management and Analytics Department , Bank of Thailand

International Conference on Real Estate Statistics 2026 , Tokyo , Japan



The Bank of Thailand's RPPI Journey

more than 20 years of RPPI

- 01 Constructing the RPPI after the ASIAN financial crisis**
The introduction of RPPI in 2004 established the foundation for consistent real estate market monitoring, but focusing on Bangkok and its vicinities.
- 02 Evolving methodology toward a practical hedonic RPPI**
Hedonic regression is employed as it is well-suited to the availability and characteristics of the loan contractual data from commercial banks.
- 03 Enhancing data coverage and refining data-filtering criteria.**
Data from Special Financial Institutions (SFIs) are incorporated into the construction of the RPPI. Robust data-filtering criteria are essential to ensure data quality and reliability.
- 04 Scaling up to the nationwide RPPI**
From initially city-level indices, the RPPI has subsequently expanded to capture and represent the residential property market nationwide.
- 05 Updating RPPI model and exploring new possibilities**
The model should be updated to improve its timeliness and better reflect current market conditions. Alternative data offers new possibilities for further enhance the indicators.



02 Evolving methodology toward a practical hedonic RPPI

- Various data sources related to residential property were evaluated based on coverage, timeliness, and data quality. Ultimately, the BOT adopted appraisal price from the Mortgage Loan Data (MGL) for constructing the RPPI.
- Appraisal price does not always correspond to actual transaction price and may differ across institutions. The key challenge lies in balancing price accuracy with data availability, timeliness, and sustainability for long-term RPPI compilation.

Data Source	Provider	Coverage	Availability	Frequency & Timeliness	Data Quality
Online asking prices	Baania (Data vendor)	Condominiums in Bangkok and its vicinities (2019–2024)	Subscription-based	Monthly / ~15-day lag	Good
Survey-based data	Property agents (e.g. AREA , CBRE)	All housing types in Bangkok and its vicinities	Subscription-based	Half year / 3–6-month reporting lag	Good
Official appraisal values	Land Department	All registered property transfers	Cooperation between the government org.	Need to be evaluated	Need to be evaluated
 Mortgage loan data (MGL)	Commercial banks & SFIs	Housing with mortgage loan (since 2007)	BOT collects the data in accordance with legal mandate	Monthly / ~21-day lag	Good

02 Evolving methodology toward a practical hedonic RPPI

- Multiple approaches were tested to identify what works with Thailand’s data characteristics and availability. This phase shaped the adoption of the current **hedonic regression with time dummies model**.
- **Key challenge** : The hedonic model requires a sufficient set of control variables to adequately capture property heterogeneity.

Dimension	Variables used in the model	Effect on RPPI
Property Size	Land area, Area Utilization	Larger property commands higher price
Location	Distance to BTS/MRT, City landmarks, CBD	Accessibility to mass transit and prime zones
Structure & Age	Building age, Number of storeys (condo)	Physical depreciation and building type
Developer Effect	Developer dummy	Brand and project quality differences
Mortgage lender	Financial institution dummy (Bank vs. SFI)	Heterogeneity across institutions
Time Dummy	Monthly time dummies	Pure price change over time (RPPI output)

$$\ln(P) = P_0 + \sum_{k=1}^n \beta_k x_k + \sum_{p=2}^{12} \alpha_p TD_p \quad \longrightarrow \quad \text{Index}_t = \frac{\exp(\alpha_{12})}{\exp(\alpha_{11})} \times \text{Index}_{t-1}$$

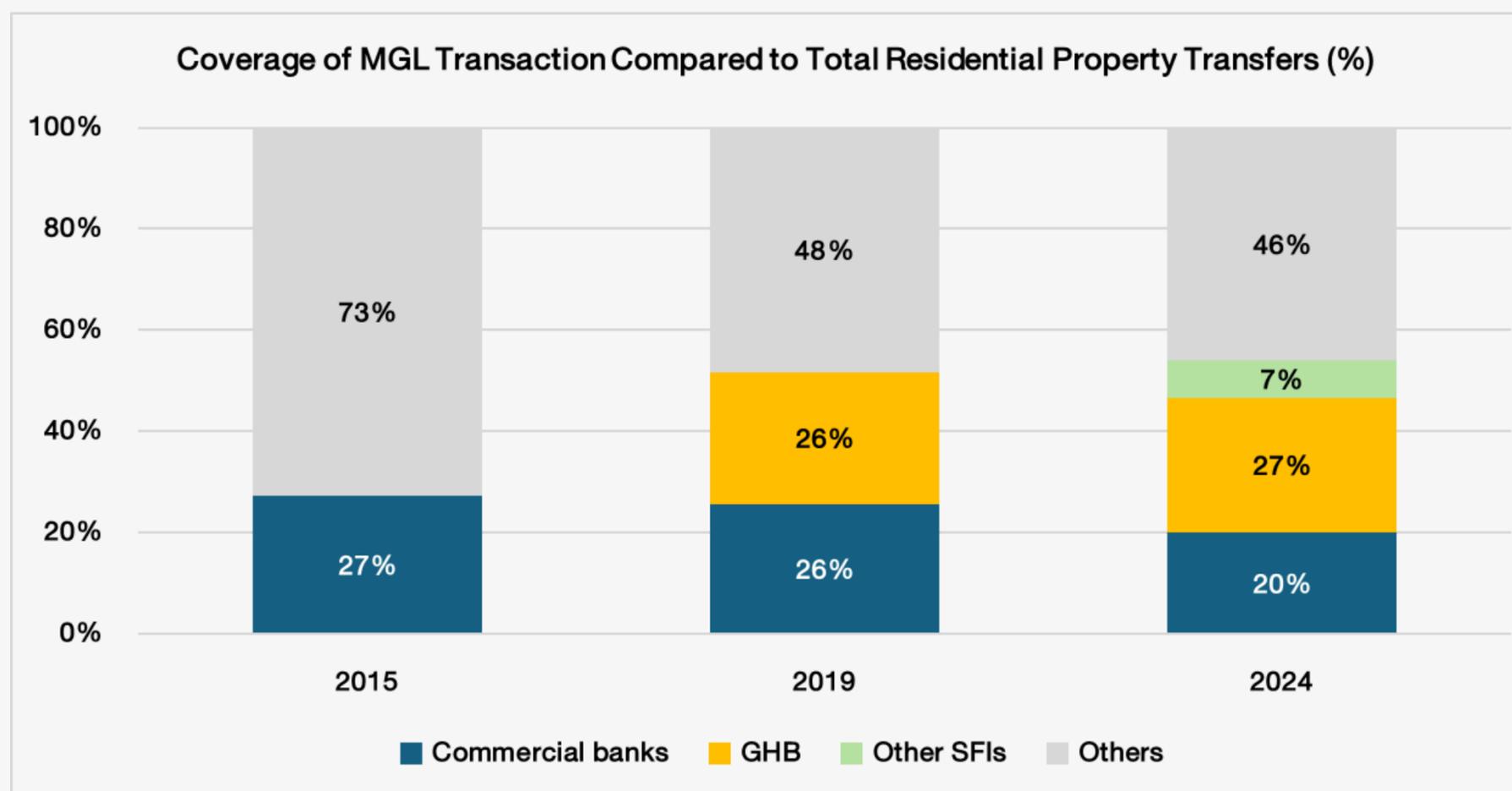
Residential characteristics (Distance, DD, Storey, Age)
Time dummies

Short term momentum

The three sub-indices from each property type, including single-detached house, townhouse, and condominium, are combined using value-based weights.

03 Enhancing data coverage and refining data-filtering criteria

- The coverage of the MGL data has expanded from a single source—commercial banks—to include one SFI (Government Housing Bank : GHB), and subsequently all remaining SFIs from 2023 onwards.
- Variations in data structures arising from different regulatory reporting systems must be addressed and properly prepared to support the RPPI construction process.



Source : Bank of Thailand and Real Estate Information Center (REIC), calculated by Bank of Thailand

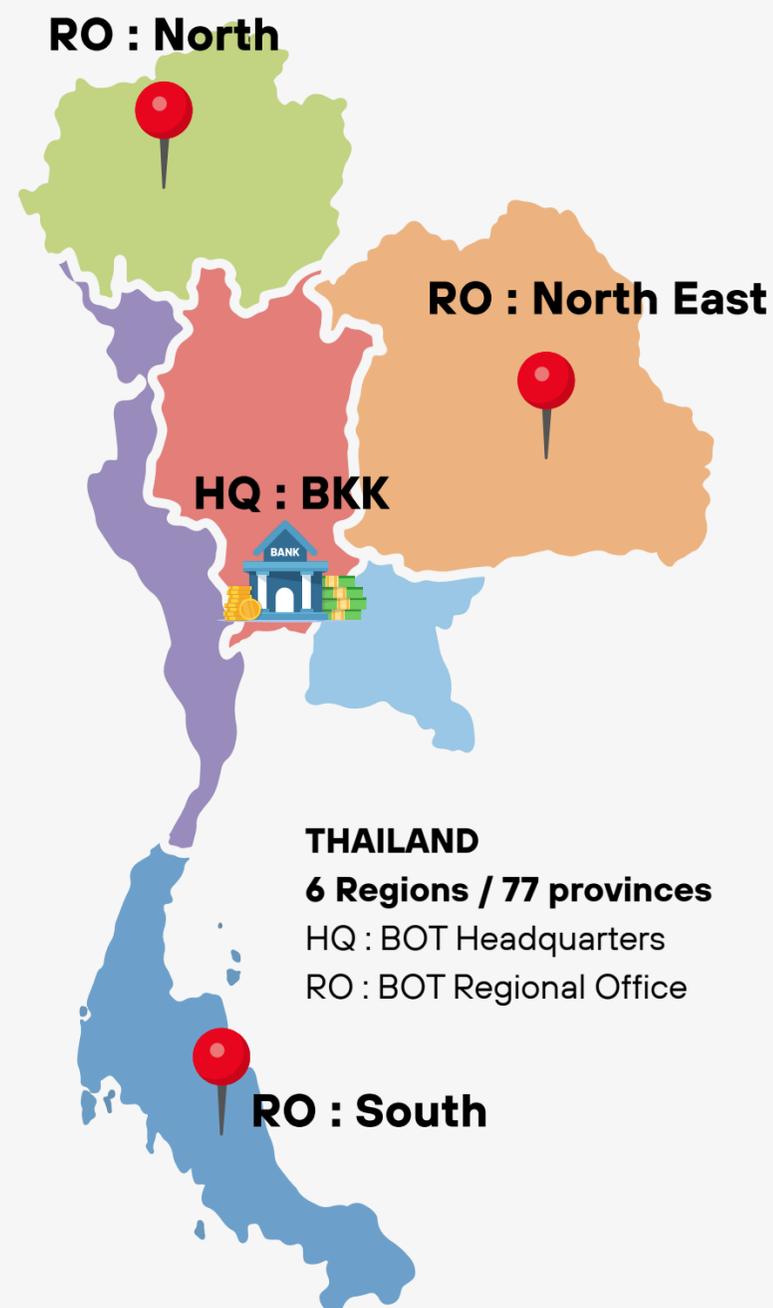
03 Integrating mortgage data and establishing data filtering

- Data-filtering rules are established to ensure consistency and robustness across different housing types. Thresholds are determined based on market characteristics, while extreme observations are managed through percentile-based criteria and statistical outlier detection methods.

Dimension	Single-Detached House	Townhouse	Condominium
Loan purpose	To purchase residential property		
Appraisal price (THB per unit)	Between 1st and 99th percentiles		
Building age (years)	< 50		
Number of floors	1–3 floors		Floor level : 1-73
Area utilization (sq. m.)	Between 1st and 99th percentiles		
Land area (sq. wah)	> 20 and below 99th percentile	> 16 and below 99th percentile	Not applicable
Statistical outlier detection	Cook's distance method*		

*Cook's distance method is a statistical measure used to detect influential observations and remove them from the index compilation each month, which helps improve the robustness of the data filtering process.

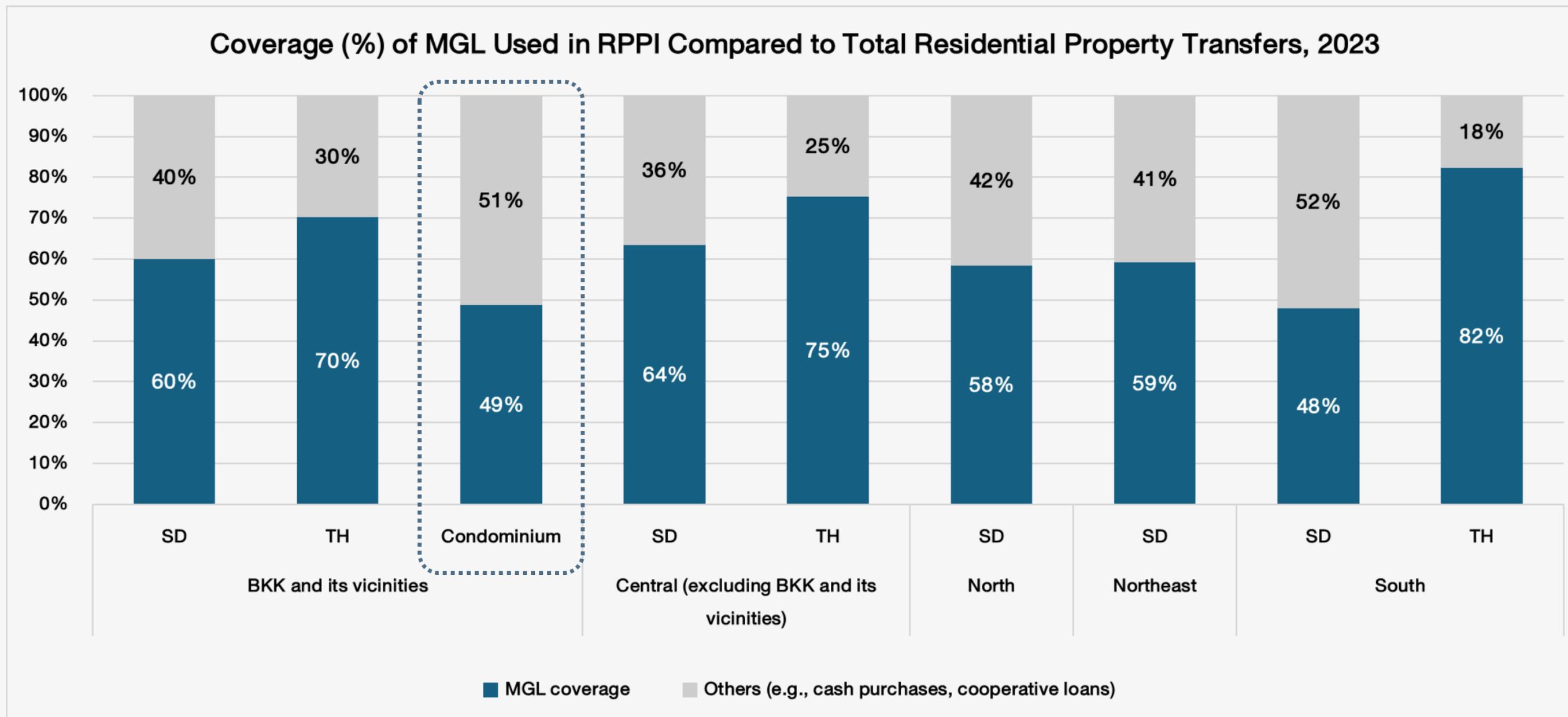
04 Scaling up to the nationwide RPPI



- The RPPI construction has expanded to cover not only Bangkok and its vicinities but also regional areas, through collaboration between the BOT Headquarter and the three Regional Offices.
- Due to low transaction volumes in many provinces and different housing market conditions across regions, the BOT selected only those provinces with sufficient transaction activity to serve as representatives for constructing **the regional RPPIs**.
- For regional RPPI, Hedonic regression with time dummies is employed while allowing local adaptation. The **'Location'** variable in the model is specified differently across provinces, reflecting key provincial landmarks used as reference points.

04 Scaling up to the nationwide RPPI

- Low-rised property is the primary segment across all regions of Thailand, whereas condominiums are predominantly concentrated in Bangkok and its vicinities.



Source : Bank of Thailand and Real Estate Information Center (REIC), calculated by Bank of Thailand

04 Scaling up to the nationwide RPPI

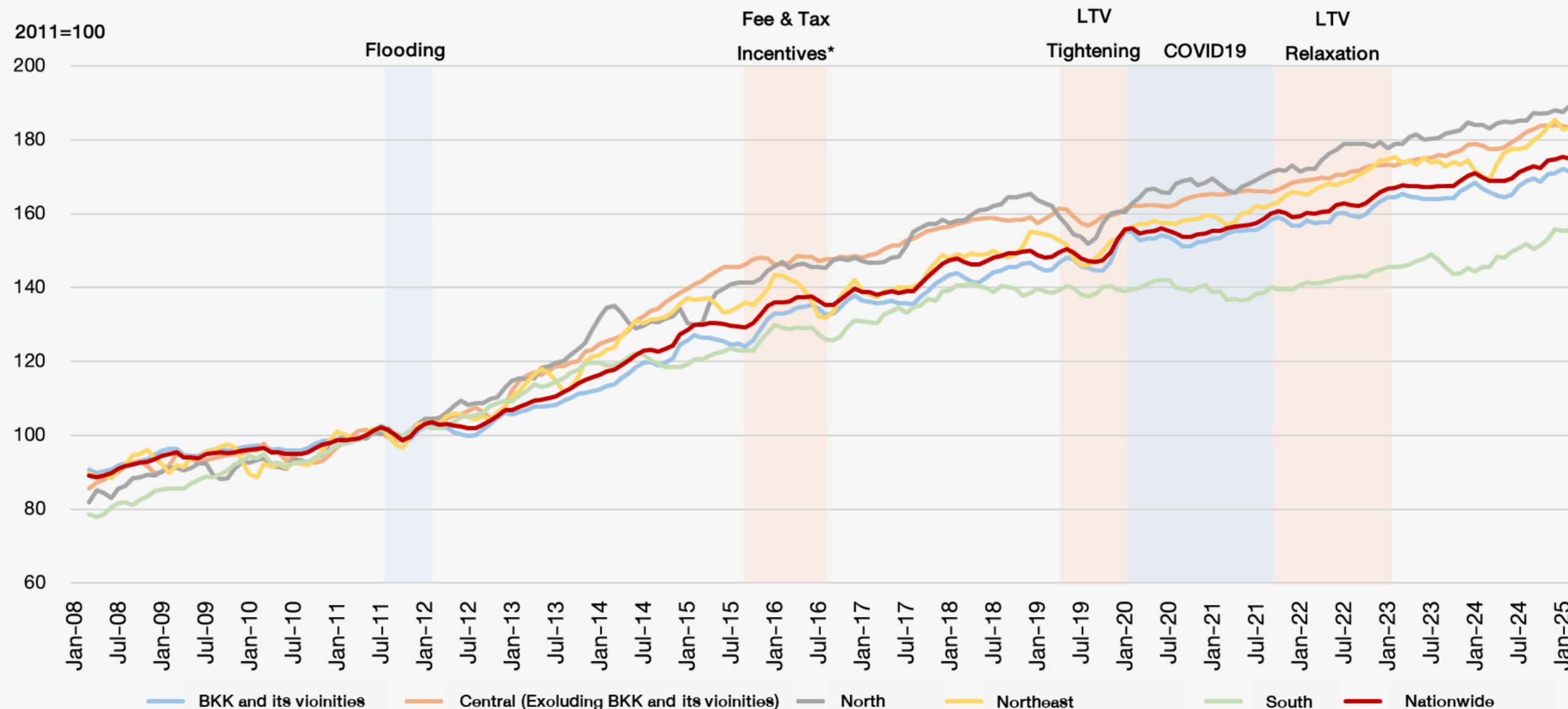
- For each region, sub-indices from all housing types are combined to produce the regional RPPIs.
- All regional RPPIs, together with the RPPI for Bangkok and its vicinities, have been aggregated into **the National RPPI** through value-based weights since 2023.

Region	List of provinces used in model		
	Single-Detached House	Townhouse	Condominium
Bangkok and its vicinities	Bangkok, Nonthaburi, Pathum Thani, Samut Prakan, Nakhon Pathom, Samut Sakhon (100%)	Bangkok, Nonthaburi, Pathum Thani, Samut Prakan, Nakhon Pathom, Samut Sakhon (100%)	Bangkok, Nonthaburi, Pathum Thani, Samut Prakan, Nakhon Pathom, Samut Sakhon (100%)
Central Region	Chonburi and Rayong (51%)	Chonburi (57%)	
Northern Region	Chiang Mai, Chiang Rai, Phitsanulok, Nakhon Sawan, Lamphun (68%)	N/A	N/A
Northeastern Region	Nakhon Ratchasima, Khon Kaen, Ubon Ratchathani, Udon Thani (55%)		
Southern Region	Songkhla, Phuket, Surat Thani, Nakhon Si Thammarat (71%)	Songkhla, Phuket, Surat Thani, Nakhon Si Thammarat (81%)	

Note : Numbers in parentheses () represent the percentage share of MGL observations in selected provinces relative to the total MGL observations in each region for each housing type.

04 Scaling up to the nationwide RPPI

- The RPPIs reflect residential property price movements in a manner consistent with broader economic conditions and policy interventions such as severe flooding and Loan-to-Value measures.



Note : * Personal income tax reduction measure for first-home buyers and measures to reduce registration fees for property right and legal transaction

Source : Bank of Thailand

05 Updating RPPI model and exploring new possibilities

- Periodically refining the hedonic model (every 3–5 years) to enhance its effectiveness in capturing current market conditions
- Developing the CPPI to complement the RPPI for comprehensive real estate risk assessment
- Exploring new and alternative data sources to enhance real estate indicators and strengthen the data ecosystem for market surveillance



THANK YOU FOR YOUR ATTENTION

