



FROM ORIGINATOR PREMIUM TO PRICE CONVERGENCE: THE GENERIC EFFECT IN THAILAND'S PROCUREMENT

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ABSTRACT

This study examined the pricing behavior of originator medicines in Thailand's public procurement system following two key market events: the first generic entry (FGE) and the expansion of market competition to three or more active competitors. A cross-sectional quantitative analysis was conducted using procurement data from the Thai Comptroller General's Department covering fiscal years 2018–2022 and encompassing 923 public hospitals nationwide. Products with generic registrations during 2019–2021 were identified, and median annual procurement unit prices were calculated before and after the occurrence of FGE and the first attainment of markets with at least three competing manufacturers or importers. From 75,755 procurement records covering 81 GPUs and 588 TPUs, 23 GPUs met the analytic criteria (11 with no generic purchases over five years; 12 with generic competition). Among the 13 GPUs experiencing first generic entry (FGE), immediate first-year originator price reductions were observed in only 2 cases (15%; bevacizumab, olopatadine). When the first generic was supplied by the same manufacturer as the originator (authorized generic), no clear price decrease was detected. For biologics, announcing a Maximum Procurement Price (MPP) at the time of FGE was associated with an average ~30% reduction in originator prices within the first year. In markets with ≥ 3 competitors, procurement prices trended downward consistently in line with reference-price implementation, and in some instances originator products withdrew from market. Overall, the findings indicate that FGE by itself does not reliably reduce prices; a MPP and more competitors are essential for achieving meaningful price reductions.

Keywords: first generic entry, procurement price, maximum procurement price

Received: 30 December 2025; Revised: 14 April 2026; Accepted: 28 April 2026

Introduction

The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) grants patent holders the exclusive rights to produce, use, sell, keep for sale, offer for sale, or import patented products within the patenting country (Department of Trade Negotiations).¹ Pharmaceutical patents are therefore one of the key factors contributing to high drug prices, as they create a quasi-monopoly that allows manufacturers to set their own prices. Patent protection results in higher drug prices and increased pharmaceutical expenditure. Once a patent expires and generic entry occurs, drug prices are generally expected to decline.²

Empirical evidence from the United States supports this phenomenon. Studies showed that after the loss of exclusivity (LOE), the prices of LOE drugs declined significantly, and the average overall market prices also had a decreasing trend.³⁻⁷

However, some reports highlighted a contradictory phenomenon regarding generic entry, known as the Generic Paradox, which is based on the concept of market segmentation.^{8,9} For example, in China, one study found that the entry of the first generic drug led to only a slight reduction in the price of the originator drug.¹⁰

In Thailand, Pradubyati & Nilbai (2017) observed the Generic Paradox after patent expiration. Generics entered the market at an average price of about 54.3% of the originator price, which reduced the sales volume of the originator. However, paradoxically, the price of the originator drug increased, with the originator price index rising by 13%.¹¹

These diverse findings indicated that policy conditions facilitating “increased competition” and leading to “genuine price reductions,” combined with the varying market structures across countries, result in different pricing behaviors. In Thailand, the pharmaceutical market differs from others due to factors such as high research and development (R&D) costs, the need for technical knowledge,

significant barriers to entry, and Maximum Procurement Price (MPP) which acted as cap prices for public providers. Moreover, under Thailand’s health insurance system, consumers and prescribers do not directly bear the full cost of drugs, which may alter price incentives and usage behaviors compared to ordinary markets.¹²

Research Objectives

1. To analyze the pricing behavior of originator drugs when the first generic entry occurs.

2. To analyze pricing behavior in markets with higher levels of competition, particularly in cases where there are three or more competitors.

Materials and Methods

This study employed a quantitative cross-sectional design using the drug procurement database of the Comptroller General’s Department (CGD) for fiscal years 2018–2022 (October 1, 2017 – September 30, 2022), covering a 5-year period. The data included procurement information from 923 public hospitals nationwide and all procurement methods stipulated under the Public Procurement and Supplies Administration Act B.E. 2560 (2017), namely: electronic bidding (e-bidding), special, and selective procurement methods.

Inclusion and exclusion criteria for study data

Study data were selected using a three-layer analytical framework consisting of the Generic Product Unit (GPU) level, the Trade Product Unit (TPU) level, and the generic–dosage form–strength level.

Layer 1: Generic Product Unit (GPU) level

Inclusion criteria

- Drug items were ranked in descending order according to total procurement value.
- Drugs within the top 30% of items with the highest procurement value were selected.
- The selected generic names were mapped to their corresponding Generic Product Unit (GPU) codes to aggregate procurement data at the generic product level.

- The resulting GPU codes were reviewed by experts, and only those considered relevant to the study objectives were included.

Exclusion criteria

- Generic drugs for which no corresponding GPU code could be identified in the Comptroller General's Department (CGD) database were excluded.
- Drug items with inconsistent numbers of sub-records across study years were excluded, as such inconsistency could compromise the comparability of longitudinal data.

Layer 2: Trade Product Unit (TPU) level

Inclusion criteria

- Only GPU codes that satisfied the inclusion criteria and did not meet any exclusion criteria in Layer 1 were eligible for further analysis.
- Eligible GPU codes were subsequently mapped to their corresponding Trade Product Unit (TPU) codes.
- The TPU codes were then linked to procurement records in the CGD procurement database to identify transaction-level procurement price data.

Exclusion criteria

- Records with no identifiable TPU code in the CGD database, and therefore no identifiable brand information, were excluded.
- Records with incomplete procurement information in the CGD database were excluded.
- Records lacking data on unit quantity or contract value in the CGD database were excluded.
- TPU-level procurement price data containing three or fewer observations were excluded because such a small number of records was considered insufficient for robust median estimation.
- TPU-level procurement price data identified as outliers were excluded to avoid distortion of the median price estimates.

Layer 3: Product selection for market structure analysis

Inclusion criteria

- Drugs for which the first generic version was registered between 2019 and 2021 were included.

- For the analysis of first generic entry, the corresponding originator drugs were included if procurement data were available in the CGD database for both the one-year period before the first generic entry and the period thereafter.

- For the analysis of market expansion, drugs were included if additional brand entries resulted in more than two brands being available in the market between 2019 and 2022.

Definitions of key terms used in the data relevance analysis

For the purpose of data standardization and price comparison, the following terms were defined:

- **Generic Product Unit (GPU):** A standardized unit representing a specific generic medicine defined by its active ingredient, strength, dosage form, and unit of use. GPU serves as the primary analytical unit for grouping medicines to ensure comparability in procurement price analyses.

- **Trade Product Unit (TPU):** A specific pharmaceutical product marketed under a particular brand or supplied by a specific manufacturer, characterized by the same active ingredient, strength, dosage form, and packaging configuration.

- **Median Procurement Price (MPP):** The median unit price of a medicine calculated from procurement transaction records for a given product unit (GPU or TPU) within the defined study period.

- **Reference Price:** The government-established median reference price used as a benchmark for comparing medicine procurement prices in the public sector.

Statistics analysis

Comparative analyses were performed under two predefined conditions: (1) the presence of the first generic entry into the market, and (2) markets with competition from ≥ 3 manufacturers. These criteria were applied to ensure that price comparisons reflected competitive market dynamics.

Annual median procurement prices were calculated for each drug to evaluate price trends. Median values were used to reduce the influence of

extreme price fluctuations. Price trends were examined retrospectively and up to the most recent year of available data to assess patterns of price convergence following generic entry.

Ethical Statement

Pass the committee approval on March 1, 2023 COE number 004/2566, as 'Research with Exemption'

Results

From the Comptroller General's Department (CGD) drug procurement database, a total of 75,755 records covering 81 GPUs (Generic Product Use) and 588 TPUs (Tradename Product Use) were identified (figure 1). The findings are as follows:

1. Impact of the First Generic Entry

The entry of the first generic drug into the market affected public procurement prices in several ways as followed:

1.1. No Impact on Originator Prices: In some cases, the first generic entry did not trigger price competition.

1.1.1. Two drugs were found to show no competitive effect, with both the first generic and the originator priced at the MPP throughout the study period. These were Cefditoren 100 mg tab and Hyaluronate sodium 180 mg/100 mL eye drops.

1.1.2. Two drugs had their first generic competitor marketed by the same company as the originator (i.e. second brand) which reduced the originator's sales volume but not the price. These were Rivastigmine 1.5 mg capsule with market share ratio in 2022 between originator versus generic (IB:LG) of 93:7, and Rivastigmine 6 mg capsule with IB:LG ratio of 100:0 in 2022.

1.1.3. Three drugs showed no price reduction by the originator despite generic entry:

- Donepezil 5 mg orodispersible tablet: IB:LG ratio in 2022 = 51:49.
- Fosfomycin 4 g vial: IB:LG ratio in 2022 = 94:6.
- Linezolid 600 mg tab: IB:LG ratio in 2022 = 23:77.

1.2. First Generic Entry Stimulated Price Competition: This was found in 9 drugs where generics triggered competitive pricing.

1.2.1. Three originator drugs reduced their prices independently of MPP:

- Bevacizumab 100 mg/4 mL vial with generic introduced in 2019 and the originator matched the competitor's price.
- Olopatadine 200 mg/100 mL eye drops with generic introduced in 2020 and the originator priced close to the competitor's price.
- Rituximab 500 mg/50 mL vial with generic introduced for 4 years before the originator priced lower than its competitors in 2022.

1.2.2. Five drugs (56%) had new MPPs announced after generic entries, leading to reductions in originator prices:

- Olopatadine 200 mg/100 mL eye drops: new MPP was announced in 2021 (second year after generic prices were found), which was 72% of the median selling price of the originator in the previous year.
- Rivastigmine 4.6 mg/24 hr. patch: new MPP was announced in 2020 (second year after generic prices were found), which was 61% of the median selling price of the originator in the previous year.

1.3. Biological Products with Originator Price Reductions Following MPP revision

- Rituximab 500 mg/50 mL vial: new MPP was announced in 2021 (third year after generic prices were found), which was 70% of the median selling price of the originator in the previous year. The announced MPP was 336.65 THB, compared to the competitor's median selling price of 192.60 THB in the prior year.
- Trastuzumab 150 mg vial: new MPP was announced in 2021 (third year after generic prices were found), which was 73% of the median selling price of the originator in the previous year. The announced MPP was 11,265.90 THB, compared to the competitor's median selling price of 3,210 THB in the prior year.

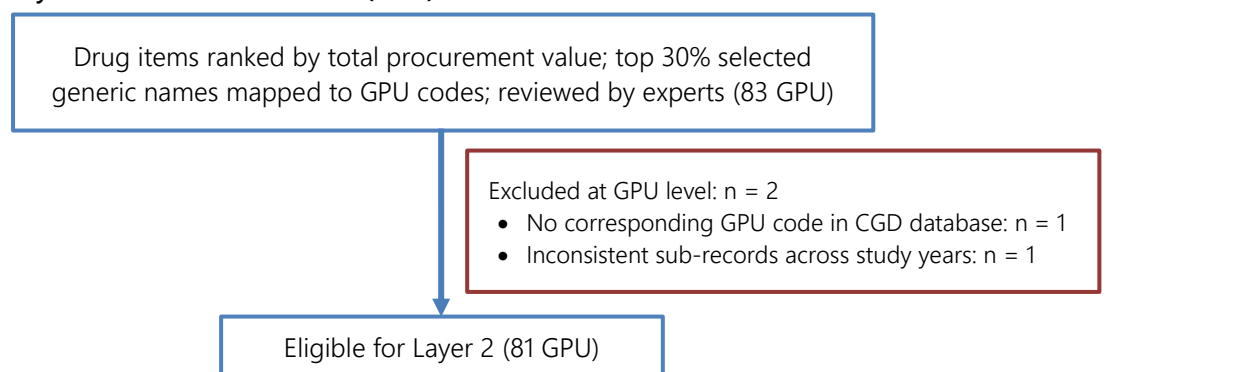
- Trastuzumab 440 mg vial: new MPP was announced in 2021 (third year after generic prices were found), which was 70% of the median selling price of the originator in the previous year. The announced MPP was 31,480.50 THB, compared to the

competitor's median selling price of 17,013 THB in the prior year.

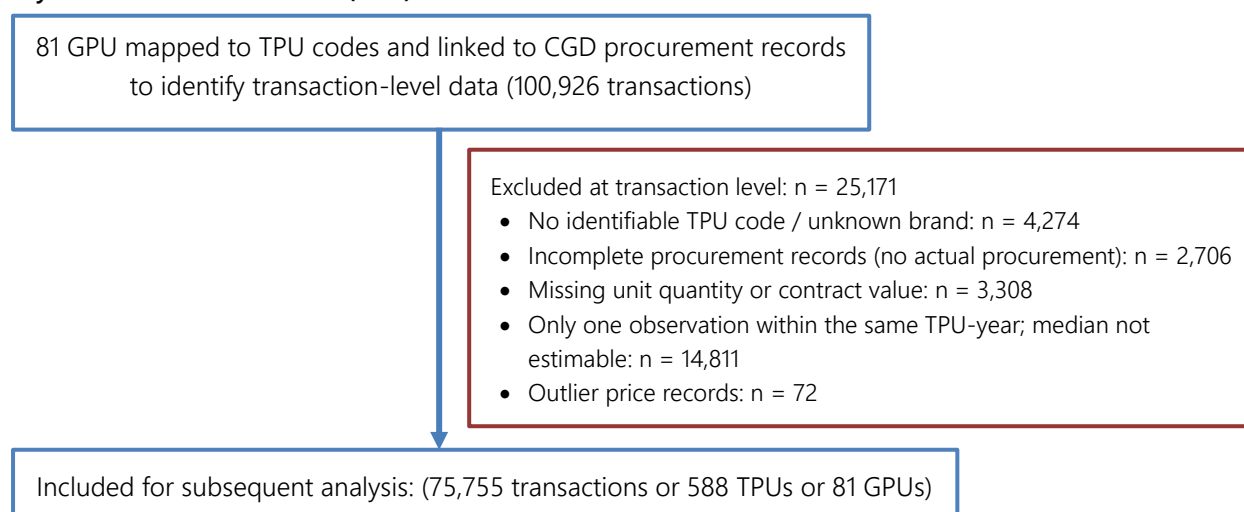
A summary of drug price trends between 2018–2022 after first generic had been introduced is presented in Table 1.

Drug screening and selection flowchart of this study

Layer 1: Generic Product Unit (GPU) level



Layer 2: Trade Product Unit (TPU)/transaction level



Layer 3: Product selection for market type analysis

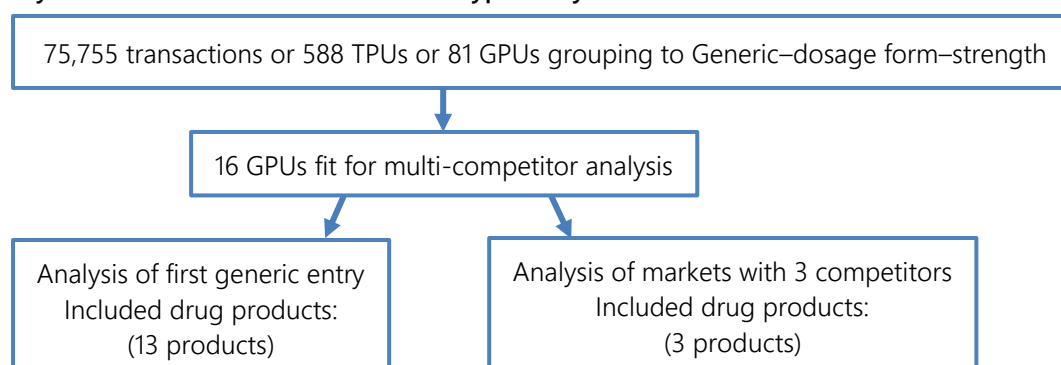


Figure 1 Drug screening and selection flowchart of this study

Table 1 Drug price trends between 2018 - 2022 after first generic had been introduced

GPU Name	Policy Tools Influencing Drug Prices	before 2018	2018	2019	2020	2021	2022
Bevacizumab 100 mg/4 ml concentrate for solution for infusion, 4 ml vial	NEDL status	yes (2013)	yes	yes	yes	yes	yes
	Thai Ref. Price (Baht)		2273.75	2273.75	2273.75	2273.75	2273.75
	Market type	Originator Price (Baht)	2,273.75	1,750.79	1,750.79	1,750.79	1,750.79
		Generic price (Baht)		1,750.79	1,350.88	1,391.00	1,750.79
Cefditoren 100 mg film-coated tablet, 1 tablet	NEDL status	no	no	no	no	no	no
	Thai Ref. Price (Baht)				24.28	24.28	24.28
	Market type	Originator Price (Baht)			24.28	24.28	24.28
		Generic price (Baht)				24.28	24.28
Donepezil hydrochloride 5 mg orodispersible tablet, 1 tablet	NEDL status	no	no	no	no	no	yes
	Thai Ref. Price (Baht)	32.14 (2017)	32.14	32.14	32.14	32.14	32.14
	Market type	Originator Price (Baht)		32.14	32.14	32.14	32.14
		Generic price (Baht)			14.98	14.29	14.29
Fosfomycin 4 g powder for solution for infusion, 1 vial	NEDL status	yes (2013)	yes	yes	yes	yes	yes
	Thai Ref. Price (Baht)						
	Market type	Originator Price (Baht)	376.64	376.64	376.64	376.64	376.64
		Generic price (Baht)				310.00	300.00
Hyaluronate sodium 180 mg/100 ml eye drops, solution, 0.3 ml unit dose	NEDL status	no	no	no	no	no	no
	Thai Ref. Price (Baht)				14.90	14.90	14.90
	Market type	Originator Price (Baht)	16.01	16.01	16.01	14.80	14.80
		Generic price (Baht)					14.80

Table 1 Drug price trends between 2018 - 2022 after first generic had been introduced (continue)

GPU Name	Policy Tools Influencing Drug Prices	before 2018	2018	2019	2020	2021	2022
Linezolid 600 mg film-coated tablet, 1 tablet	NEDL status	yes (2013)	yes	yes	yes	yes	yes
	Thai Ref. Price (Baht)		1,283.00	1,283.00	1,283.00	1,283.00	1,283.00
	Market type	Originator Price (Baht)	1,282.93	1,282.93	1,282.93	1,282.93	1,282.93
		Generic price (Baht)				749.00	350.96
Olopatadine 200 mg/100 ml eye drops, solution, 2.5 ml bottle	NEDL status	no	no	no	no	no	no
	Thai Ref. Price (Baht)					68.51	68.51
	Market type	Originator Price (Baht)	109.03	108.77	96.94	95.02	68.50
		Generic price (Baht)			95.93	95.02	64.20
Rituximab 500 mg/50 ml concentrate for solution for infusion, 50 ml vial	NEDL status		yes	yes	yes	yes	yes
	Thai Ref. Price (Baht)		483.64	483.64	483.64	336.65	336.65
	Market type	Originator Price (Baht)	483.64	483.64	483.64	483.64	181.90
		Generic price (Baht)		243.10	213.79	192.60	186.18
Rivastigmine 1.5 mg capsule, hard, 1 capsule	NEDL status	no	no	no	no	no	no
	Thai Ref. Price (Baht)	30.5 (2017)	30.50	30.50	30.50	30.50	30.50
	Market type	Originator Price (Baht)	34.53	30.50	30.50	29.73	30.50
		Generic price (Baht)		27.82	27.82		27.82
Rivastigmine 4.6 mg/24 hr transdermal patch, 1 patch	NEDL status	no	no	no	no	no	no
	Thai Ref. Price (Baht)	123.68 (2017)	123.68	123.68	72.00	72.00	72.00
	Market type	Originator Price (Baht)	117.45	117.45	117.45	71.98	71.98
		Generic price (Baht)		117.45	75.00	60.00	58.00

Table 1 Drug price trends between 2018 - 2022 after first generic had been introduced (continue)

GPU Name	Policy Tools Influencing Drug Prices	before 2018	2018	2019	2020	2021	2022
Rivastigmine 6 mg capsule, hard, 1 capsule	NEDL status	no	no	no	no	no	no
	Thai Ref. Price (Baht)	60.99 (2017)	60.99	60.99	60.99	60.99	60.99
	Market type	Originator Price (Baht)	60.99	57.93	57.93	57.93	57.93
		Generic price (Baht)				51.98	
Trastuzumab 150 mg powder for concentrate for solution for infusion, 1 vial	NEDL status	yes (2015)	yes	yes	yes	yes	yes
	Thai Ref. Price (Baht)					11,265.86	11,265.86
	Market type	Originator Price (Baht)	15,340.59	15,340.59	15,328.82	15,328.82	11,264.96
		Generic price (Baht)		12,410.43	3,210.00	3,210.00	3,210.00
Trastuzumab 440 mg powder and solvent for concentrate for solution for infusion, 1 vial	NEDL status	yes (2015)	yes	yes	yes	yes	yes
	Thai Ref. Price (Baht)					31,480.47	31,480.47
	Market type	Originator Price (Baht)	44,999.92	44,972.10	44,972.10	44,972.10	31,480.47
		Generic price (Baht)		37,967.92	17,013.00	17,013.00	10,700.00

2. Markets with Competition from Three or More Manufacturers

When the number of generic competitors in the market increases, new MPP can be set at lower levels, directly affecting the median selling prices in public sector. The findings are as follows:

2.1. Originator drugs reduced prices to compete with generics-Ceftriaxone 1 g vial: The MPP for this drug was set in 2020 at 27.50 THB, while the median selling price in 2019 was 9.31 THB (IB) and 9.78 THB (LG). Prices remained relatively stable, showing no clear difference before and after the MPP announcement. In this case, the originator company (Rocephin®) demonstrated willingness to reduce its price to compete in the market without relying on the MPP.

2.2. Post-MPP announcements, it was found that, for 8 out of 10 drugs, the originators' median selling prices in the following year aligned with or were very close to the MPP (95–100% of the MPP).

2.3. Some originator drugs disappeared from the market instead of competing on price which two originator drugs were found to withdraw from the market after the MPP announcement, with the manufacturer shifting the focus to alternative formulations of the same drug with higher MPP. These were:

- Aricept 5 mg film-coated tablet: MPP in 2020 was 15 THB for this formulation. So it was replaced with Aricept 5 mg dispersible tablet (MPP = 32.14 THB) instead.
- Aricept 10 mg film-coated tablet: MPP in 2020 was 25 THB for this formulation. So it was replaced with Aricept 10 mg dispersible tablet (64.28 THB) instead.

2.4. MPPs were announced lower than the median selling prices in public providers

2.4.1. For 11 out of 12 drugs (92%), the Subcommittee on Maximum Procurement Price set new MPPs below the originator's median selling prices in the previous year. On average, these new MPPs were 64.2% of the median selling price in the year before.

2.4.2. For 4 out of 12 drugs (33%), new MPPs were announced at the same price or lower than the generics' median selling prices in the year prior to the announcement. These were:

- Olopatadine 200 mg/100 mL eye drops: MPP in 2021 was 68.51 THB versus the generic median selling price at 95.02 THB in 2020.
- Infliximab 100 mg vial: MPP in 2021 was 8,762.23 THB versus generic median selling price at 9,737 THB in 2020.
- Rivastigmine 4.6 mg/24 hr patch: MPP in 2020 was 72 THB versus generic median selling price at 117.45 THB in 2019.
- Rivastigmine 9.5 mg/24 hr patch: MPP in 2020 was 72 THB versus generic median selling price at 117.45 THB in 2019.

A summary of drug price trends between 2018–2022 in markets with three or more competitors are presented in Table 2.

Discussion

The findings of this study reveal that the presence of a first generic entry (FGE) alone is not sufficient to automatically drive down originator drug prices in the absence of specific regulatory measures. Only 2 out of 13 drugs (≈15%) showed a price reduction in the first year of generic entry (bevacizumab and olopatadine). Furthermore, when the first generic was an authorized generic (produced by the same manufacturer as the originator), no clear signal of price competition was observed. This suggests that FGE without the entry of a truly new market player does not exert significant downward price pressure.

In contrast, for biological products, the announcement of a new MPP alongside generic entry accelerated the decline in originator prices, with an average reduction of about 30%. This highlighted the role of pricing policy in prompting faster market adjustment. These pricing behaviors differ from earlier studies.^{3-6,8}

Table 2 Drug price trends between 2018 - 2022 in markets with three or more competitors

GPU Name	Policy Tools Influencing Drug Prices		before 2018	2018	2019	2020	2021	2022
Dorzolamide 2 g/100 ml + timolol 500 mg/100 ml eye drops, 5 ml	NEDL status			yes	yes	yes	yes	yes
	Thai Ref. Price (Baht)			59.92	59.92	59.92	59.92	59.92
	Market type	Year in which the market became an oligopoly		yes	yes	yes	yes	yes
		Year in which the market became multi-competitor						yes
		Originator Price (Baht)		59.92	59.92	59.92	59.92	59.92
		Generic price (Baht)		58.42	50.08	47.72	45.37	46.01
Entecavir 500 mcg film-coated tablet, 1 tablet	NEDL status		no	no	no	no	no	yes
	Thai Ref. Price (Baht)						35.67	35.67
	Market type	Year in which the market became an oligopoly		yes	yes	yes	yes	yes
		Year in which the market became multi-competitor						yes
		Originator Price (Baht)		47.97	47.97	47.97	47.97	35.67
		Generic price (Baht)		47.97	47.97	34.00	32.10	32.10
Pemetrexed 500 mg powder for concentrate for infusion, 1 vial	NEDL status		no	no	no	no	no	yes
	Thai Ref. Price (Baht)			31,993.00	31,993.00	31,993.00	31,993.00	31,993.00
	Market type	Year in which the market became an oligopoly		yes	yes	yes	yes	yes
		Year in which the market became multi-competitor						yes
		Originator Price (Baht)			31,993.00	31,993.00	31,993.00	31,993.00
		Generic price (Baht)			25,252.00	25,252.00	25,252.00	25,252.00

Regarding the impact of markets with three or more competitors, the findings suggest that in setting MPPs, it is not always necessary to include the originator. Instead, the median selling price of generics in the preceding year can be used as the benchmark.

Therefore, in designing drug price control policies, FGE should be complemented by additional measures, particularly MPP revisions. At the same time, a balance must be struck between “value for money” and “supply sustainability.” Setting MPPs too low may lead to manufacturer withdrawals and risk of drug shortages, while prices that are too high reduce budgetary efficiency. Quality monitoring and supply reliability, especially for biologics and high-technology generics, must go hand in hand with MPP and procurement policy design.

The analysis of biologics provides preliminary guidance for MPP setting:

- If retaining the originator in the market is desired, the reference price should be set at around 65% of the originator’s median selling price in the prior year. This level is sufficient to stimulate competition without forcing the originator out of the market.

- If retention of the originator is not necessary, the generic median selling prices in the previous year can serve directly as the MPP.

Moreover, as the number of competitors increases, regulators must closely monitor supply-side risks, including shortages, manufacturer exits, and product quality, to ensure that competition leads to genuinely sustainable price reductions.

The findings of this study reveal that the presence of a first generic entry (FGE) alone is not sufficient to automatically drive down originator drug prices in the absence of specific regulatory measures. Only 2 out of 13 drugs (~15%) showed a price reduction in the first year of generic entry (bevacizumab and olopatadine). Furthermore, when the first generic was an authorized generic (produced by the same manufacturer as the originator), no clear signal of price competition was observed. This suggests that FGE without the entry of a truly new

market player does not exert significant downward price pressure.

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Conclusion

In summary, price regulation, particularly through MPP, together with sufficient market competition (at least three competitors), are necessary conditions for achieving meaningful drug price reductions.

Acknowledgements

We also thank the Faculty of Pharmacy, Thammasat University, for their support in completing this research.

Grants and Funding Information

Research reported in this publication was supported by the Health System Research Institute of Thailand under award number 65-145

References

1. Department of Trade Negotiations, Ministry of Commerce. Key elements of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) [Internet]. 2012 [cited 2025 Jul 11] Available from: <https://www.dtn.go.th/th/file/get/file/1.2022040737693cfc748049e45d87b8c7d8b9aacd150149.pdf>
2. World Trade Organization. Intellectual property (TRIPS) and pharmaceuticals - Technical note [Internet]. 2016 [cited 2025 Jun 10] Available from: https://www.wto.org/english/tratop_e/trips_e/pharma_ato186_e.htm
3. Jamjoom M, Almutairi RD, Seoane-Vazquez E, Brown LM, Burnham T, Rakovski C, et al. Generic entry and effect of market competition on outpatient pharmacy drug prices. *J Generic Med*. 2024;20(2):69-76.
4. Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services. Drug competition series: Analysis of new generic markets effect of market entry on generic drug prices: Medicare data 2007-2022 [Internet]. 2025 [cited 2025 Jun 10] Available from: <https://aspe.hhs.gov/reports/analysis-new-generic-markets-effect-market-entry-generic-drug-prices>
5. IMS Institute for Healthcare Informatics. Price declines after branded medicines lose exclusivity in the U.S. [Internet]. 2016 [cited 2025 Jun 20] Available from: <https://www.iqvia.com/-/media/iqvia/pdfs/institute-reports/price-declines-after-branded-medicines-lose-exclusivity-in-the-us.pdf>
6. Jones AM, Serra-Sastre V, Kim H. The impact of generic entry of pharmaceuticals in Australia. *Value Health Reg Issues*. 2024;43:1-8.
7. Roughead E, Kim DS, Ong B, Kemp-Casey A. Pricing policies for generic medicines in Australia, New Zealand, the Republic of Korea and Singapore: Patent expiry and influence on atorvastatin price. *WHO South East Asia J Public Health*. 2018;7(2):99-106.
8. Regan TL. Generic entry, price competition, and market segmentation in the prescription drug market. *Int J Ind Organ*. 2008 Jul;26(4):930-48.
9. Jelovac I. Generic entry, price competition, and market segmentation in the prescription drug market-A comment [Internet]. 2025 [cited 2025 May 10] Available from: https://hal.science/hal-05038524/file/WP_2512.pdf
10. Li W, Li X, He Y, Shi L, Chen J. Effects of generic entry on market shares and prices of originator drugs: Evidence from Chinese pharmaceutical market. *Pharmacoecon Open*. 2025 Jul;9(4):639-48.
11. Pradubyati N, Nilbai T. The paradox of competition in Thailand's pharmaceutical industry after patent expiry. In: *Proceedings of the 2017 National Economics Conference: Global Economic Volatility and Its Impact on ASEAN Sustainability*; 2017 May 25; Bangkok, Thailand. Bangkok; 2017. (in Thai)
12. Sooksriwong C, Hirunrassamee S, Suwattanapreeda S, Maluangnon K, Chuachantra T, Babar ZU, et.al. Medicine prices situation survey in Thailand and design the pricing policy [Internet]. 2024 [cited 2026 Mar. 6] Available from: <https://kb.hsri.or.th/dspace/handle/11228/6143>. (in Thai)