

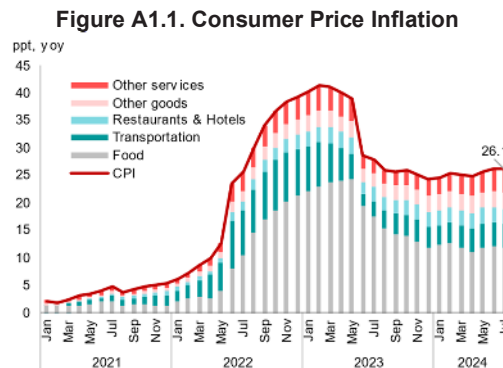
Annexes: Selected Issues

1. Inflation Dynamics: The Impact of People's Sentiments⁹⁴

Inflation has surged sharply in Lao PDR in a way the economy had never experienced in the last two decades. Persistently high inflation has dampened real income and purchasing power, threatening macro-financial stability and growth. As such, the Laotian authorities identify containing elevated inflation as a critical policy goal. This selected issue attempts to clarify the drivers of recent high inflation and suggest areas where policymakers are recommended to focus on to achieve their policy goal. The assessment reveals the significant role that people's sentiments, namely expectations of inflation and kip depreciation, play in recent inflation dynamics. The Laotian authorities are recommended to implement policies directed toward anchoring such expectations.

Recent Inflation Dynamics

1. Lao PDR has been facing persistently high consumer price inflation. The consumer price index (CPI) in Lao PDR accelerated in early 2022 amid spikes in global commodity prices, especially oil, and sharp kip depreciation. Although inflation moderated after peaking at 41.3 percent on a year-on-year basis in February 2023, it remained elevated, hovering at around 25 percent (yoy) since August 2023 (Figure A1.1). This level and trend of inflation are exceptional compared with the other ASEAN+3 economies, where inflation had decelerated to less than 5 percent after the surge in 2022 (Table A1.1).



Source: CEIC; AMRO staff calculations
Note: Monthly data is available up to July 2024.

Table A1.1. Inflation in ASEAN+3 Region (% yoy)

Economies	2021	2022	2023	2024						
				Jan	Feb	Mar	Apr	May	Jun	Jul
Brunei	1.7	3.7	0.4	0.1	-0.5	-0.5	-0.2	-0.2	-0.3	
Cambodia	2.9	5.3	2.1	-0.5	-0.3	0.0	0.5	1.1	0.7	
China	0.9	2.0	0.2	-0.8	0.7	0.1	0.3	0.3	0.2	0.5
Hong Kong, China	1.6	1.9	2.1	1.7	2.1	2.0	1.1	1.2	1.5	
Indonesia	1.6	4.2	3.7	2.6	2.8	3.0	3.0	2.8	2.5	2.1
Japan	-0.2	2.5	3.3	2.1	2.8	2.7	2.5	2.9	2.9	
Lao PDR	3.8	23.0	31.2	24.4	25.4	25.0	24.9	25.8	26.2	26.1
Malaysia	2.5	3.4	2.5	1.5	1.8	1.8	1.8	2.0	2.0	
Myanmar	3.6	13.2	24.4							
Philippines	3.9	5.8	6.0	2.8	3.4	3.7	3.8	3.9	3.7	4.4
Singapore	2.3	6.1	4.8	2.9	3.4	2.7	2.7	3.1	2.4	
South Korea	2.5	5.1	3.6	2.8	3.1	3.1	2.9	2.7	2.4	2.6
Thailand	1.2	6.1	1.2	-1.1	-0.8	-0.5	0.2	1.5	0.6	0.8
Vietnam	1.8	3.2	3.3	3.4	4.0	4.0	4.4	4.4	4.3	4.4

Source: National authorities via CEIC; AMRO staff calculations

Note: Inflation numbers for 2021 to 2023 are period averages. Myanmar's inflation numbers are based on its fiscal year. Blank cells mean the data is unavailable.

⁹⁴ Prepared by Naoaki Inayoshi, Economist

2. The price increases in Lao PDR are broad-based. Food and transport prices, which account for more than half of the CPI basket weight, have been the main contributors to headline inflation. In 2023, these prices rose by 38.0 percent and 25.6 percent on average, respectively, and inflation remains heightened in 2024 (Table A1.2). However, it is important to note that almost all of the items in the CPI basket are experiencing double-digit inflation. The service sector and imported goods, such as medical-related items and clothing, are exhibiting strong price increase momentum.

Table A1.2. Inflation by CPI Basket Category (% , yoy)

CPI Basket: Categories	2021	2022	2023	2024						
				Jan	Feb	Mar	Apr	May	Jun	Jul
Foods & Beverages	3.0	22.0	38.0	25.3	25.5	23.6	22.0	23.1	23.7	23.5
Alcohol & Tobacco	4.5	14.2	24.8	22.2	25.0	26.4	28.5	29.6	28.8	29.4
Clothing & Footwear	3.9	16.3	27.6	33.4	35.1	36.2	37.6	31.3	29.5	27.9
Housing, Water, Light, Fuel Charges	3.0	16.4	21.1	19.1	20.4	21.9	24.3	27.3	32.5	34.1
Furnishings & HH Equipment	3.8	18.7	28.5	24.5	25.8	26.4	27.1	26.3	28.0	30.1
Medical Care	4.2	27.6	30.4	31.0	32.5	34.6	36.1	38.5	41.7	39.9
Transport	6.4	41.3	25.6	20.0	22.6	23.6	26.0	27.7	26.7	26.2
Telecommunication	4.2	7.7	10.6	6.2	5.6	5.7	5.2	3.4	3.5	4.1
Entertainment & Recreation	1.2	10.7	18.3	17.8	19.7	21.5	22.5	23.8	25.2	26.2
Education	0.5	6.4	10.9	15.3	17.0	19.3	20.7	21.6	24.7	27.8
Restaurants & Hotels	3.1	18.8	34.7	36.0	35.1	35.9	35.3	36.6	35.3	34.4
Miscellaneous	8.1	21.3	19.5	21.1	23.6	24.3	27.3	28.4	29.6	33.0

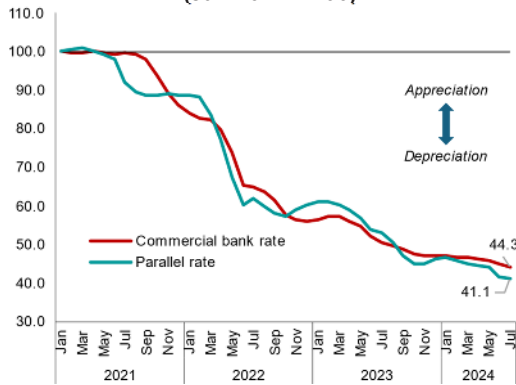
Source: Lao Statistics Bureau; AMRO staff calculations
 Note: Inflation numbers for 2021 to 2023 are period averages.

Potential Inflation Drivers

3. Past studies found that the exchange rate of the kip, inflation in Thailand, and global oil prices have strong influence on price movements in Lao PDR. While the number of studies on inflation dynamics in Lao PDR is limited, AMRO (2017) empirically showed that both the foreign currency exchange rate, especially against the Thai baht, and the nominal effective exchange rate (NEER), as well as CPI inflation in Thailand were positively associated with Lao inflation. AMRO (2017) attributed this result to Lao PDR's high dependency on imports, mainly from Thailand. Later, AMRO (2020) also found that exchange rate shocks would have a more persistent effect on inflation, while the impacts of global oil price shocks on domestic prices were relatively short-lived. IMF (2023) estimated that the foreign exchange rate pass-through was about 25 percent in the short term and around 50 percent in the long term.

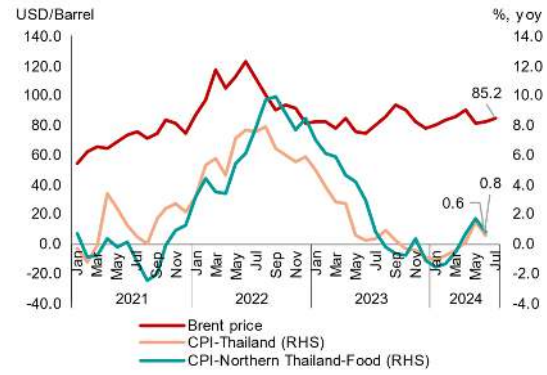
4. However, such factors may not fully explain the inflation dynamics recorded since August 2023. Without a doubt, the persistent kip depreciation will likely be consistently exerting stress on domestic prices (Figure A1.2), while pressures from other external drivers have moderated. For instance, global oil prices have moderated since H2 2022 (Figure A1.3). Moreover, overall inflation in Thailand and food prices in northern Thailand, where Lao PDR imports most of its food products, decelerated in 2023 (Figure A1.3). Nevertheless, the fact that domestic prices in Lao PDR have not come down and remain under strong inflationary pressure suggests the existence of other drivers.

Figure A1.2. Nominal Effective Exchange Rate (Jan 2021 = 100)



Source: BOL; CEIC; AMRO staff calculations
Note: Monthly data is available up to July 2024. The presumed share of currencies used for trade settlement in Lao PDR was applied as a time-varying weight to calculate the NEER instead of the conventional bilateral trade value since that may underestimate the weight of the LAK/USD exchange rate, which is merely 2.4 percent. As a result, the cross rates constructing this NEER are USD, THB, VND and CNY. The applied weights are 67.0 percent, 22.3 percent, 2.6 percent and 8.1 percent, respectively. The parallel NEER reflects the parallel rates of LAK/USD and LAK/THB.

Figure A1.3. Brent Price and CPI in Thailand



Source: CEIC; AMRO staff calculations
Note: Monthly data on Brent prices is available up to July 2024. Monthly data on CPI in Thailand covers up to June 2024.

5. Sentiments on the ground, namely people’s expectations of inflation and kip depreciation, may play a pivotal role in the recent inflation dynamics. The unprecedented and prolonged sharp increases in domestic prices and the depreciation of the kip may have triggered and amplified expectations of further high inflation and kip depreciation. As a result, businesses continue to set prices that reflect future potential price increases, making the high inflation sticky in Lao PDR. To assess this point, we define inflation and kip depreciation expectations as below:

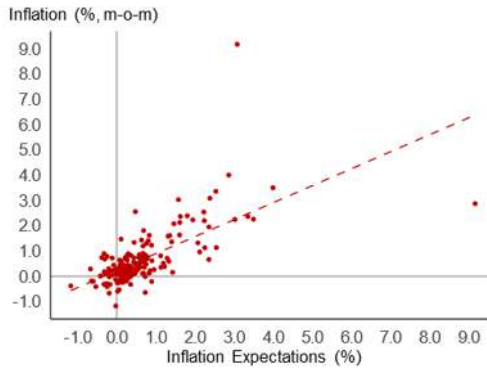
$$\text{Inflation Expectations} = \Delta \ln (CPI)_t^e = \Delta \ln (CPI)_{t-1} \quad (1)$$

$$\begin{aligned} \text{Depreciation Expectations} &= \Delta \ln (FX_{depreciation})_t^e \\ &= \Delta \ln (FX_{gap})_{t-1} = \Delta \ln \left(\frac{FX_{parallel}}{FX_{bank}} \right)_{t-1} \end{aligned} \quad (2)$$

where inflation expectations for month t , $(\Delta \ln (CPI)_t^e)$, are represented by a month-on-month CPI inflation of the previous month $(\Delta \ln (CPI)_{t-1})$, and expectations of kip depreciation for month t , $(\Delta \ln (FX_{depreciation})_t^e)$, by the previous month’s monthly change in gap between the parallel and commercial bank foreign exchange rates $(\Delta \ln \left(\frac{FX_{parallel}}{FX_{bank}} \right)_{t-1})$ as proxies.⁹⁵ Figures A1.4 and A1.5 are scatter plots showing each type of expectations on the x-axis and the month-on-month CPI inflation on the y-axis from January 2010 to July 2024. The figures suggest a positive relationship between these expectations and inflation.

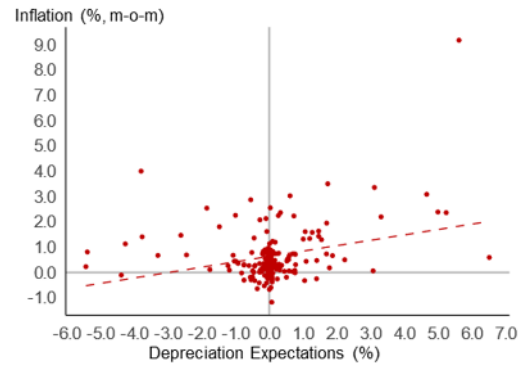
⁹⁵ In the case of the NEER, the numerator and the denominator are reversed $(\Delta \ln \left(\frac{FX_{bank}}{FX_{parallel}} \right)_{t-1})$ since the increase in the NEER value indicates kip appreciation, which is opposite from the cross rates.

Figure A1.4. Inflation Expectations vs. Inflation



Source: Lao Statistics Bureau; AMRO staff calculations
Note: The dotted line represents the fitted line of the plot.

Figure A1.5. Depreciation Expectations vs. Inflation



Source: BOL; Lao Statistics Bureau; AMRO staff calculations
Note: The dotted line represents the fitted line of the plot. The depreciation expectations in this figure were computed using the gap between the parallel and commercial bank rates of the NEER.

Empirical Assessment

6. An empirical study is conducted to clarify further the role of people’s sentiments on inflation. The following model is used to carry out an OLS regression analysis to quantitatively estimate the impact of inflation and kip depreciation expectations on the recent inflation dynamics. All variables are converted into logs and take the first difference (e.g. log difference from the previous month) so that each value represents a monthly change.

$$\Delta \ln(CPI_{LA})_t = \beta_1 \Delta \ln(CPI_{LA})_t^e + \beta_2 \Delta \ln(FX_{depreciation})_t^e + \beta_3 \Delta \ln(FX)_{t-1} + \beta_4 \Delta \ln(M2)_{t-1} + \beta_5 \Delta \ln(CPI_{TH})_{t-1} + \beta_6 \Delta \ln(Brent)_{t-1} + \mu_{month} + \epsilon_t \quad (3)$$

t denotes the month t , $\Delta \ln(CPI_{LA})$ denotes the month-on-month CPI inflation in Lao PDR, $\Delta \ln(CPI_{LA})^e$ denotes inflation expectations in Lao PDR, and $\Delta \ln(FX_{depreciation})^e$ denotes kip depreciation expectations. Other covariates that are presumed to be influencing inflation are also included: $\Delta \ln(FX)$ denotes the change in commercial bank’s foreign exchange rate from the previous month’s value; $\Delta \ln(M2)$ shows the change in kip-denominated broad money from the previous month’s value; $\Delta \ln(CPI_{TH})$ represents the month-on-month food price inflation in northern Thailand; and $\Delta \ln(Brent)$ is the change in Brent crude oil price in U.S. dollars from the previous month’s value. Moreover, μ_{month} is a month fixed effect and ϵ_t is an error term. Since $\Delta \ln(CPI_{LA})^e$ and $\Delta \ln(FX_{depreciation})^e$ could be replaced by the previous equations (1) and (2), the above model can be transformed as below:

$$\Delta \ln(CPI_{LA})_t = \beta_1 \Delta \ln(CPI_{LA})_{t-1} + \beta_2 \Delta \ln(FX_{gap})_{t-1} + \beta_3 \Delta \ln(FX)_{t-1} + \beta_4 \Delta \ln(M2)_{t-1} + \beta_5 \Delta \ln(CPI_{TH})_{t-1} + \beta_6 \Delta \ln(Brent)_{t-1} + \mu_{month} + \epsilon_t \quad (4)$$

The analysis covers monthly data from January 2010 to March 2024 based on data availability.

7. The empirical results reveal the critical roles that expectations of inflation and kip depreciation play in the recent inflation dynamics. Table A1.3 summarizes the regression results using different foreign exchange rates for variables FX_{gap} and FX : NEER, LAK/USD and LAK/THB. In all cases, the results indicate inflation and kip depreciation expectations as important inflation drivers by showing positive coefficients with statistical significance at the 1 percent level. For instance, taking the result of the LAK/USD case, a 1 percent increase on a month-on-month basis in the CPI at month t could accelerate the CPI in the next month ($t + 1$)

by 0.34 percent. Also, a 1 percent increase on a month-on-month basis in the gap between the parallel and commercial bank LAK/USD exchange rates at month t could increase the CPI at month $t + 1$ by 0.14 percent. Foreign exchange rates and broad money were also identified as important inflation drivers, consistent with past studies. Food prices in northern Thailand were found to be statistically significant in the case of the NEER. The Brent oil price was statistically insignificant in all the cases. These results imply that the inflation dynamics in Lao PDR since August 2023 are driven more by domestic than global factors.

Table A1.3. Regression Results

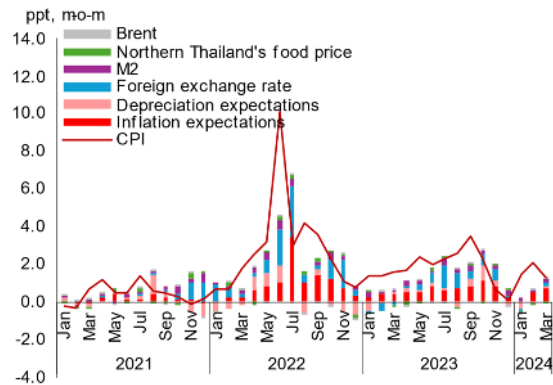
	Dependent variable: CPI Inflation		
	NEER (1)	LAK/USD (2)	LAK/THB (3)
Inflation expectations (β_1)	0.337*** (0.084)	0.339*** (0.083)	0.476*** (0.072)
Depreciation expectations (β_2)	0.227*** (0.060)	0.139*** (0.043)	0.275*** (0.072)
Foreign exchange rate (β_3)	0.160*** (0.044)	0.215*** (0.056)	0.101** (0.042)
M2 in LAK terms (β_4)	0.083** (0.036)	0.084** (0.036)	0.097*** (0.036)
CPI inflation of food in northern Thailand (β_5)	0.167* (0.100)	0.161 (0.100)	0.134 (0.100)
Brent price in USD terms (β_6)	0.002 (0.005)	0.004 (0.005)	-0.001 (0.006)
Month Fixed Effect	Yes	Yes	Yes
Observations	170	170	170
R ²	0.574	0.575	0.567

Note: Numbers in parentheses represent the standard error. *p<0.1, **p<0.05, ***p<0.01.

Conclusion

8. Moving forward, the Laotian authorities are advised to enhance the anchoring of the public's inflation and kip depreciation expectations. It is hardly possible to identify all the inflation drivers and comprehensively explain the complex price-setting behaviors of the economy in a single model. The above model is not an exception. For instance, future studies may benefit by further analyzing the relationship between domestic production capacity and consumer price inflation, or by taking a closer look at how the expectations have formed in recent months. Different approaches such as vector autoregressive models or error correction models may also be considered to further clarify inflation dynamics by removing potential biases in the current OLS model. Nevertheless, the results from this study confirm the importance of focusing on people's expectations of inflation and kip depreciation to moderate the currently strong inflationary pressures. Both types of expectations firmly contribute to the recent inflation, their magnitudes having amplified in recent years (Figure A1.6). As discussed in the main text, the Bank of Lao PDR is encouraged to maintain its tight monetary policy stance to anchor inflation expectations and introduce more market-friendly foreign exchange policies to ease kip depreciation expectations.

Figure A1.6. Inflation Decomposition



Source: BOL; Lao Statistics Bureau; CEIC; AMRO staff calculations
 Note: The calculations cover up to March 2024 due to data availability and are based on the LAK/USD exchange rate case of the regression results.

References

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