

EXPLAINING INFLATION IN CAMBODIA

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Summary

This paper presents an empirical analysis of the causes of inflation. Given the economy is heavily dollarized and Cambodia shares an open border with Viet Nam and Thailand, price developments in Cambodia would be expected to be heavily influenced by those in its two most important trading partners. The study finds that there is a complete transmission of international food inflation to Cambodia via its main trading partners. The growth of monetary aggregates also matter in an environment of economic overheating. The study finds that narrow money growth exacerbated inflation of non-tradable goods as shown by elevated core inflation. The paper concludes that both fiscal and monetary measures are necessary to control inflation. It also provides suggestions for strengthening monetary policy in the longer term and sustainable ways to mitigate the effects of price shocks on poor and vulnerable families.

I. INTRODUCTION

1. The Cambodian authorities requested the Southeast Asia Regional Department of ADB to undertake an assessment of the inflationary process in Cambodia. The request was motivated by the unexpected surge in global commodity prices and its seemingly rapid transmission to domestic inflation. The surge in domestic inflation also occurred at a time when there was some evidence that the economy was overheating and monetary aggregates and domestic credit were expanding at unprecedented rates of growth. Authorities were concerned that the expansion in monetary aggregates was also exacerbating domestic inflation and therefore the need to identify the appropriate mix of fiscal and monetary policies to control inflation.

2. This paper assesses the inflationary process in Cambodia by undertaking an empirical analysis of the causes of inflation.¹ The paper adds value to the discussion on inflation in Cambodia in three ways. First, the study develops two measures of core inflation (excludes raw food, energy and transportation from the index), which allow Cambodian authorities to assess whether ‘*second round*’ inflationary effects on the wider economy had emerged from the recent supply-related price shock. It also provides authorities with a tool to assess ‘*second round*’ effects from any future shocks to the economy. The computation of the core measures is included in Appendix 1. Second, the paper presents empirical estimates of the causes of inflation, allowing us to isolate the relative importance of international and domestic influences on domestic inflation. The statistical results and the model also provide authorities with tools for forecasting inflation over the short term. Third, by identifying and quantifying the causes of inflation and its transmissions, authorities can identify the appropriate mix of instruments (fiscal and monetary levers) to control inflation.

3. Inflation in Cambodia rose significantly starting in September 2007. From an average of 3.9 percent during December 2002 to 2006, year-on-year consumer price inflation increased to 25.7 percent in May 2008. The latest data suggest that inflation pressures have eased since June, but inflation remains high at 22.3 percent in July. Being a small open² economy with an open border with Viet Nam and Thailand, international commodity price developments is expected to exert a strong influence on inflationary process in Cambodia. The transmission of inflation from trading partners and its influence on the inflationary process in Cambodia has an important implication for domestic macroeconomic policy. Under the current dollarized regime, monetary policy would have a limited role to play. But many analysts believe that a rapid growth in monetary aggregates has also added fuel to the recent spike of inflation.

4. Two findings of the study warrant emphasis. First, the empirical analysis conducted in this study suggests that the transmission of inflation from trading partners, Viet Nam and Thailand, plays a dominant role in explaining inflation in Cambodia, particularly through food prices which contain more tradable goods. This arises because Cambodia’s tradable goods sector is highly integrated with the Thai and Viet Nam economies through extensive trade. Second, core inflation also picked up by 2-3 percent, indicating that demand and domestic factors also played a role in explaining the recent price inflation. In particular, the growth in narrow money is also found to affect core inflation and its impact has intensified since late 2007 when the economy showed signs of economic overheating. Thus, it is important to monitor core inflation when evaluating inflation trends

¹ For more discussion see Edimon Ginting and Kelly Bird (2008), “An Empirical Analysis of Inflation in Cambodia,” ADB, Manila.

² Official trade is about 110% of GDP in 2007. Imports from Viet Nam and Thailand account for about 32 percent of Cambodia’s total import. Anecdotal evidence suggests that unofficial import is very large due to a long- stretched border with the two countries.

and causes. Assessment of headline inflation, and its causes may not pick up the monetary causes of underlying inflation in the economy.

5. The layout of the remainder of this paper is as follow. Section II discusses recent price developments in Cambodia. Section III provides an empirical analysis of inflation in Cambodia drawing on the recent of inflation in a small, open economy such as Cambodia. Section IV presents policy implications and conclusions.

II. RECENT PRICE DEVELOPMENTS

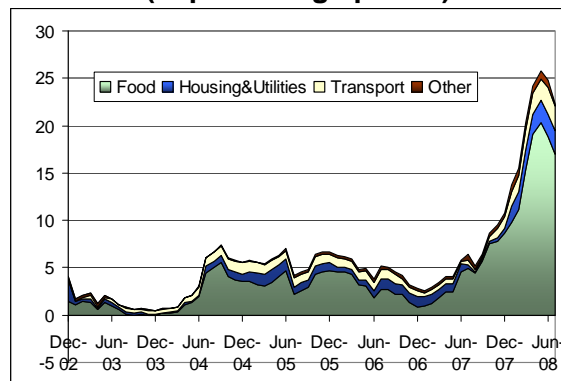
6. In this section, recent price developments are evaluated by computing the contribution of each main items of the Phnom Penh Retail Price Index (PP-RPI). Two simple core inflation measures are constructed to isolate the impact of food, fuel, and transportation that are mainly attributed to supply shocks. The analysis suggests that the recent spike in inflation was mainly driven by a surge in the prices of food, fuel, and transportation. However, core inflation also picked up by 2-3 percent, indicating that demand and domestic factors also played a moderate role in explaining the recent price inflation. In assessing the potential influence of demand and domestic factors on inflation, we begin with evaluating trends in the output gap (i.e., the difference between GDP potential GDP) to assess whether the economy was showing signs of ‘overheating’ in 2007. We then examine the factors that may influence potential overheating such as growth in monetary aggregates and fiscal policy. The results of the evaluation suggest that the economy was showing symptoms of economic overheating and may have contributed to the pick up in core inflation.

Contributors to Recent Price Inflation

7. **The rise in food prices was a major contributor to the recent spike in inflation.**

Food items have traditionally contributed significantly to price inflation in Cambodia. However, the contribution of these items increased markedly from 2.7 percentage points in 2006 to 9 percentage points in 2007. At the peak in May 2008, food items contributed about 21 percentage points, over 80 percent of the total inflation for the month. Continued higher fuel prices also pushed inflation further through the transportation sector. The contributions of other major items, such as utilities, medical care, education and other household items were relatively small and stable. In part, this is because the Government administers electricity charges and has kept them unchanged since February 2006. Housing (rent)—item with the second largest weight (27.3 percent) after food in the PP-RCI—has also increased by about 4 percent since January 2008, but by a much lower rate than the overall inflation.³

Figure 1
Contribution to Inflation 2002-2008
(in percentage points)



Source: National Institute of Statistics, Cambodia and ADB staff calculation

³ Food price inflation is not unique to Cambodia. Other countries in the region have faced similar inflationary pressures in early 2008 triggered by the surge in global commodity prices. However, Cambodia's food inflation in 2008 has been among the highest in Asia.

8. Food price inflation in Cambodia closely tracks inflation in Thailand and Viet Nam (Figure 2).

Food price inflation in Cambodia has followed the trend of international commodity prices since mid-2007. However, it is interesting to point out that food price inflation in Cambodia has tracked closer the food price inflation in two of its main trading partners (Thailand and Viet Nam) than international food prices since 2003. This suggests that large food trade across the borders allow for some degree of price equalization between Cambodia and its two larger trading partners. Therefore, food price developments in these two countries are more directly relevant in explaining domestic inflation in Cambodia

than international food price indicators. Statistical evidence of this strong integration with regional inflation is presented below (para 15). Figure 3 provides further evidence of Cambodia's food price integration with Thailand and Viet Nam. Panel A shows the deviation of Cambodia's headline price inflation from Thailand and Viet Nam's inflation (i.e., divergence from zero). Panel B shows the deviation in food price inflation. As apparent from Panel A, Cambodia's headline inflation has been much lower than the weighted average of Thailand and Viet Nam's inflation from 2003 to 2007. A statistical test on the trend between the two inflation series shows a weak co-movement suggesting a weak relationship over the long run.⁴ In contrast, Cambodia's food price inflation has moved closely with that of Thailand and Viet Nam as demonstrated by the smaller deviations from zero. Statistical tests confirm that Cambodia's food inflation converges to Thailand and Viet Nam's food inflation over the longer term (i.e., food inflation in the three countries are highly integrated). Both the headline and food price inflation trends reversed in 2008. The reasons for the divergence are explored in the next section.

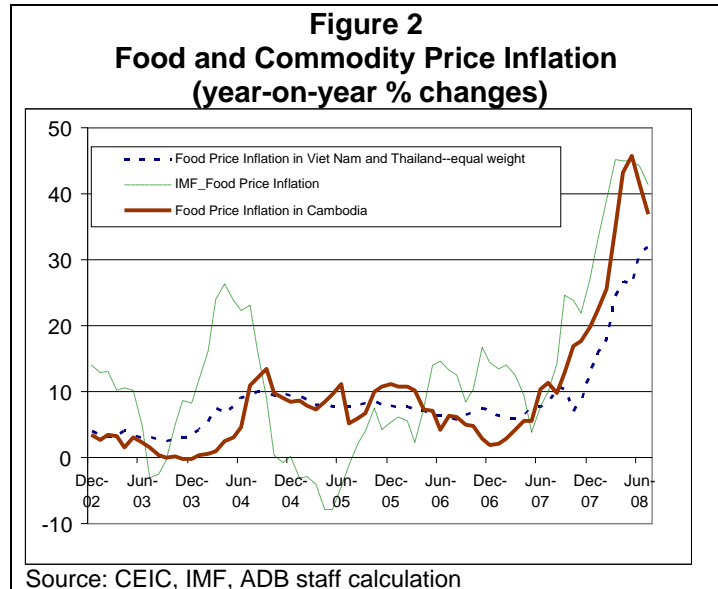
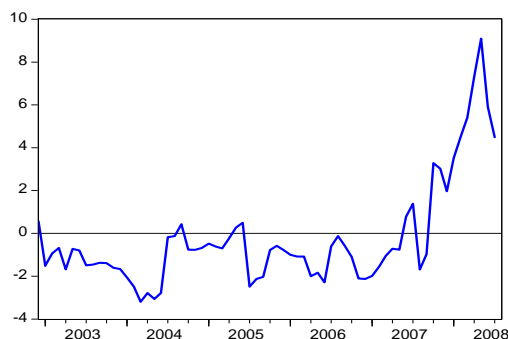
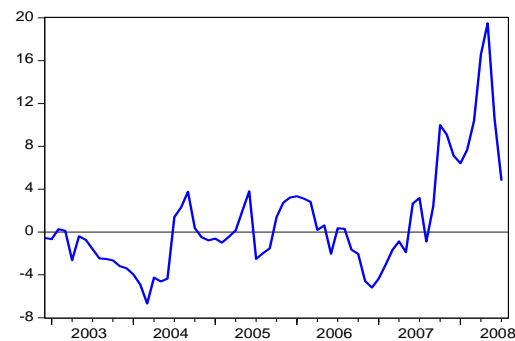


Figure 3: Deviation of Cambodia's Inflation from Trading Partner Inflation

(a) Headline Inflation



(b) Food Price Inflation



Sources: ADB Staff Calculation

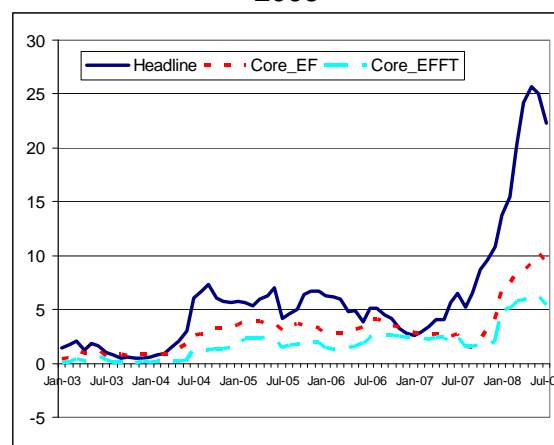
⁴ The tests refer to cointegration tests. These are used to determine whether Cambodia's inflation co-moves or converges with trading partners' inflation over the longer term.

9. **Core inflation.** It is widely recognized that, at times, the CPI inflation can be a misleading indicator of the underlying inflation. Thus, many central banks have found it useful to monitor core inflation measures, which separate temporary shocks from the inflationary process and, hence, represent the underlying price movements more accurately. Core inflation is useful in the conduct of monetary policy in two ways. First, since core inflation excludes temporary price fluctuations originated from supply disturbances (Ball and Mankiw (2004) and Roger, 1997), it could be considered as a measure of inflation that is the outcome of policy and, hence, more controllable by the monetary authorities. Second, because monetary policy affects economic activity with long and variable lags, it is not a good tool for countering temporary price movements, so policymakers are more interested in the inflation outlook. To the extent that core inflation measures can isolate the underlying trend to which inflation will return, they could be a useful short-term guide for future projections of total CPI inflation.

10. A number of analysts believe that a strong expansion of monetary growth has contributed to the recent spike of inflation in Cambodia. Analysis of core inflation measures would be useful in answering whether or not, and to what extent, monetary growth contributes to inflation in Cambodia. We construct two core inflation measures for Cambodia to allow us to analyze the underlying price movements. The first measure is derived by excluding food items (core_EF), which accounted for about 39 percent weight in the PP-RPI. The second measure excludes food, fuel, and transport (core_EFFT) with about 44 percent weight in the PP-RPI, (see Appendix 1 for computation of the core inflation measures).

11. **Core inflation is much lower than headline inflation, suggesting that the prices of the food items were the major cause of the recent episode of inflation spike.** Figure 4 present headline inflation and the two measures of core inflation. As illustrated, gap between the headline inflation rate and the two core inflation measures widened substantially after July 2007, suggesting that the surge in food prices was the main cause of the spike in inflation. The gap between core_EF and core_EFFT (which excludes energy and transport) had also widened in 2008, implying that the prices of fuel and transport are also an important source of inflation.

Figure 4: Core Inflation Measures, 2003-2008

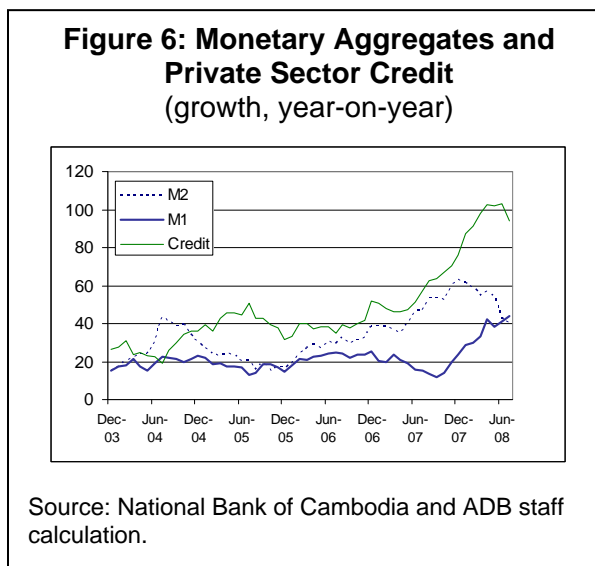
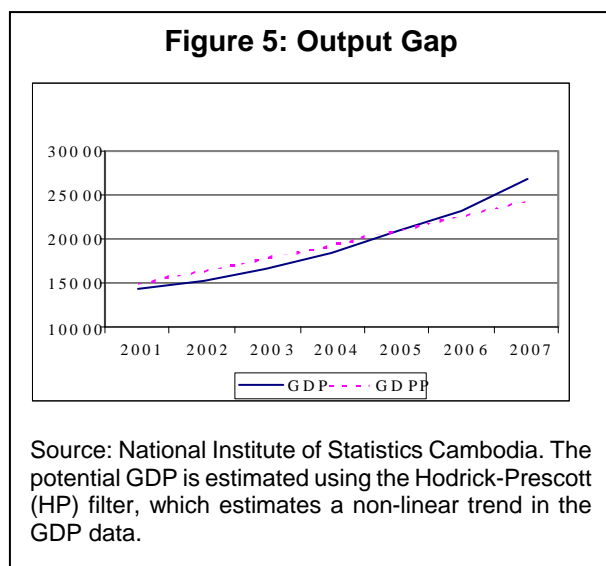


Sources: National Institute of Statistics, Cambodia, and ADB staff calculation.

12. **Core inflation picked up at the end of 2007, suggesting second round effects were occurring.** While the prices of food, fuel, and transport seem to have a dominant role in explaining the recent inflation, the recent trend in core inflation suggests that domestic factors also contribute moderately. Core inflation has stepped up gradually since late 2007, implying that inflationary expectation had elevated and that the second round effects of internationally driven inflation have spread to other non-tradable sectors.

13. **Demand factors may have played a role in the increase in core inflation in late 2007.** One measure of domestic demand pressures on inflation is the output gap, which measures the difference between actual output (real GDP) and estimates of the potential output (GDP-P). A

positive output gap is indicative of excess demand pressures in the economy. Figure 5 shows that actual GDP was close to estimates of potential GDP from 2001 to 2006. However, in 2007 tentative evidence indicated that actual GDP was beginning to significantly diverge from its potential growth path in part fueled by very high growth in monetary aggregates and commercial bank lending (Figures 6). Broad money grew at 61% year-on-year in December 2007 due to large capital inflows but moderated to 40% in July 2008. Narrow money (M1) growth – a closer determinant of inflation than broad money supply – picked up further from 20% in December 2007 to 43% (year-on-year) in July 2008. Private sector expanded at a record level of 76% by December 2007, but also moderated in 2008, expanding by 35% in July 2008.



14. **Prudent fiscal policy helped moderate demand pressures.** Fiscal policy appeared slightly countercyclical in 2007 and 2008. The current surplus increased to 3.1% of GDP in 2007 from 1.2% of GDP in 2006, and the overall budget deficit declined in 2007. The overall deficit for the first semester of 2008 is estimated at 0.4% of GDP, down from 2.8% in 2007. Indicative of the current surpluses, the Government accumulated deposits at the National Bank of Cambodia amounting to 6% of GDP by December 2007, and this accumulation continued throughout 2008.

III. CAUSES INFLATION IN CAMBODIA

15. The analysis presented above finds that trading partners' inflation plays an instrumental role in explaining food inflation in Cambodia. However, the headline inflation in Cambodia only weakly co-moves with the weighted headline inflation of trading partner countries. This implies that other domestic factors are also important in explaining the inflationary process in Cambodia through nontradable goods. In this section, factors influencing inflationary process in Cambodia are examined more formally. These factors include trading partners' inflation, exchange rate and the growth of monetary aggregates. The core inflation measure is expected to be influenced more by domestic factors such as growth in monetary aggregates. Therefore, as separate model is also tested for the core inflation measure. The empirical model presented in this study draws on recent literature on inflation in a small, open economy.

16. The inflation model presented here separates the short term impacts from the long term determinants of inflation in Cambodia. There will be temporary shocks that influence inflation in the short term, but dissipate over the longer term.

17. To examine these factors, the following long-term model is proposed:

$$\pi_t^{CAM} = (\pi_t^{INT}, ER_t^{INT}, M1_t, D_t) \quad (1)$$

π_t^{CAM} is year-on-year percent change of price inflation in Cambodia.

ER_t^{INT} is weighted year-on-year percent change of trading partners' exchange rate against the US dollar. Given that Cambodia is a highly dollarized economy, the appropriate exchange rate used in the model is the trading partners' (Thailand and Viet Nam) exchange rate against the US dollar rather than trading partner's exchange rate against the Cambodian riel.

$M1_t$ is year-on-year growth of narrow money, which is a closer determinant of inflation than M2.

D1 is a dummy variable to capture the excess output gap that emerged in 2007. The interaction between the D1 and other variables will also be examined.

18. We expect the following relations with π_t^{CAM} :

- An increase in π_t^{INT} implies an increase in π_t^{CAM} .
- A decrease in ER_t^{INT} implies an increase in π_t^{CAM} . A decrease in ER_t^{INT} indicates a depreciation in the US dollar against the trading partners currencies. This in turn implies higher international tradable prices facing Cambodia, and therefore higher domestic inflation.
- An increase in $M1_t$ implies an increase in π_t^{CAM} .
- D1 is expected to be positive.

19. The short-term dynamic of inflation in Cambodia is evaluated by taking the changes in the variables specified in equation (1), adding lagged terms, and an error correction term (ECM):

$$\Delta\pi_t^{CAM} = \sum_{j=1}^m \alpha_j \Delta\pi_{t-j}^{CAM} + \sum_{j=1}^n \beta_j \Delta\pi_{t-j}^{INT} + \sum_{j=1}^n \delta_j \Delta ER_{t-j}^{INT} + \sum_{j=1}^n \kappa_j \Delta M1_{t-j}^{INT} - \gamma(ECM_{t-1}) + \varepsilon_t \quad (2)$$

where $ECM_{t-1} = (\pi_{t-1}^{CAM} - \beta_j \pi_{t-1}^{INT} - \delta_j ER_{t-1} - \kappa_j M1_{t-1})$ is the adjustment parameter. If the coefficient of the ECM is less than 1 then this suggests that Cambodian inflation may diverge from trading partners' inflation in the short term, but converges towards it over the longer term. The ECM parameter can be used to calculate the speed of adjustment or the number of months its takes for the price shock to converge back to its long run relationship.

20. The data for narrow money are obtained from the NBC and the exchange rate data for Viet Nam and Cambodia are from CEIC. The model is estimated for the period of 2003:12 to 2008:7 due to limited available time series data for Cambodia. The estimation results for both the long- and short-run models are presented in Table 1.

Table 1: Estimated Long- and Short-term Relationships

Long-term Relationship:

$$(3.1a) \pi_t^{CAM_Headline} = -1.66 + 1.09\pi_t^{INT_Headline} + 0.16M1_t * D1_t; \quad R^2 = 0.96$$

(-2.87) (11.13) (6.01) t-statistic

$$(3.1b) \pi_t^{CAM_Food} = -1.08 + 1.07\pi_t^{INT_Food} + 0.42D1_t * \pi_t^{INT_Food}; \quad R^2 = 0.92$$

(-2.17) (13.67) (5.37) t-statistic

$$(3.1.c) \pi_t^{CAM_Core} = 0.13 + 0.079M1_t + 0.076M1_t * D1_t; \quad R^2 = 0.77$$

(0.27) (3.14) (5.58) t-statistic

Short-term Relationship:

$$(3.2a) \Delta\pi_t^{CAM_Headline} = 0.46\Delta\pi_{t-1}^{CAM_Headline} + 0.49\Delta\pi_{t-1}^{INT_Headline} - 0.13(ECM_{t-1}); \quad R^2 = 0.29$$

(3.54) (2.78) (-2.28) t-statistic

$$(3.2a) \Delta\pi_t^{CAM_Food} = 0.49\Delta\pi_{t-1}^{CAM_Food} + 0.72\Delta\pi_{t-1}^{INT_Food} - 0.18(ECM_{t-1}); \quad R^2 = 0.36$$

(4.13) (3.91) (-2.97) t-statistic

$$(3.2a) \Delta\pi_t^{CAM_Core} = 0.07\Delta M1_{t-1} - 0.21(ECM_{t-1}); \quad R^2 = 0.24$$

(2.92) (-2.24) t-statistic

Source: ADB staff calculation

21. **Long run determinants of inflation.** The first three equations of Table 3 show the long-term relationship between three inflation measures (headline, food, and core) in Cambodia and their explanatory variables. The results suggest:

i. **Trading partner's inflation is the most important variable in explaining variation of inflation in Cambodia.** This is true for both the headline and food inflation (equations 3.1a and 3.1b). The interaction between trading partner food inflation and the dummy variable D1 is also found to be strongly significant in the food price equation(3.1.b), confirming the deviation of domestic food inflation since early 2007.

ii. **Narrow money and its interaction with the dummy variable are important in explaining core inflation.** This finding implies that M1 matters for domestic inflation through nontradable prices and has exerted a stronger influence since late 2007 when the economy showed signs of overheating (equation 3.1.c). However, the magnitude of the money supply variable is moderate prior to 2007. Prior to 2007 the coefficient was 0.07 – a 10% increase in M1 growth adds 0.7% to core inflation. During 2007 when the economy

was exhibiting signs of overheating, the money coefficient doubled to 0.155 – a 10% increase in M1 raised inflation by 1.55%. Money does not influence food price inflation as Cambodia's tradable goods sector is integrated with its larger neighbors (equation 3.1.a). Money only had an impact on headline inflation when interacted with the dummy variable (equation 3.1.a). This positive influence of money on headline inflation is primarily due to its transmission through core inflation.

iii. **The exchange rate had no statistical impact on headline or core inflation** and is omitted from all equations. At first this seems surprising that the exchange rate had no statistical impact on Cambodia's inflation rate. It may be that the exchange rate effects work through trading partners' inflation rates. This finding that the exchange rate pass-through is negligible for Cambodia is consistent with recent findings for other countries that participate in common currency arrangements such as currency unions (i.e., the EU) and currency boards. In particular, several recent empirical studies show that the exchange rate pass-through tends to decline in countries that share common currency arrangements. Most of the reduction in pass through to consumers under common currency arrangements happens somewhere along the pricing chain between the border and the retailer (Slavov, 2008).

22. **Short term impact.** The estimation results of the short-term inflation model for the three inflation measures are presented in the bottom of Table 3 (Equation 3.2a to 3.2c). The system was initially estimated with a number of lags, but only variables with significant t-statistics are retained. The dummy variable and its interaction are excluded from the system. The results suggest:

i. **There is some inflation persistence.** The lagged dependent variable is statistically significant in both equations for the headline and food inflation, suggesting some inflation persistence. But the coefficient for the lagged dependent variable is not large enough to prevent the convergence of inflation to its long-term value.

ii. **Trading partners' inflation influences headline and food inflation in the short term.** The coefficient is much larger in the equation for food inflation, indicating that trading partner inflation play a more dominant role in explaining the dynamic of food inflation than in the headline inflation in Cambodia.

iii. **The coefficients of the error-correction term for the headline and food inflation are 0.13 and 0.18, respectively, suggesting a relative fast adjustment period.** The coefficient for food inflation is about 50% larger than the same coefficient for the headline inflation. This means that the adjustment for food inflation when it deviates from that of the trading partners happens much faster than the headline inflation. The coefficient of 0.18 implies that the convergence process (half-life) would be completed in two to three months. The relatively quick adjustment for food inflation suggests a flexible and integrated product markets for tradable sectors.

iv. **Narrow money is the main variable explaining the short-term dynamic of the core inflation.** A lag up to 12 months was tested using the same equation, but only the first lag was found to be statistically significant. While the lag seems rather short, this may reflect the feature of a largely cash based economy.

IV. POLICY IMPLICATIONS AND FUTURE CHALLENGES

23. The findings of the paper point to a number of policy implications both in the short term and longer term. The paper summarizes the implications and makes suggestions for improving the policy framework and measures to mitigate effects of price shocks on the poor.

24. **Short term:**

- **Food price developments in Cambodia, which explain large variation of the headline inflation, are linked to the international process through its trading partners.** Energy and transport costs have also contributed to the recent spike of inflation. This is because fuel prices in Cambodia move with international prices. Domestic macroeconomic policies play only a limited role in influencing these sources of inflationary pressure in the long run.
- **Core inflation, excluding food, energy, and transport, is a better measure of underlying inflation in Cambodia and should be closely monitored.** Core inflation has picked up since late 2007. The pick up in core inflation is indicative of the *second round effects* of international price inflation to domestic nontradable prices. At the same time there was evidence that the economy was overheating that may have exacerbated the pick up in core inflation.
- **The transmission of domestic macroeconomic policy (monetary and fiscal policy) to domestic prices is through the prices of nontradable goods and services.** This transmission would be reflected in core inflation. Since the study shows growth of M1 influences the movement of core inflation in Cambodia, monetary policy can contribute in reducing domestic inflation through prices of nontradable goods and services. Therefore, this finding supports NBC's recent to tighten monetary policy by increasing reserve requirement, limiting commercial bank's exposure to the property sector, and temporarily relaxing capital controls to put excess liquidity overseas. If part of the current supply driven food price inflation persists, the NBC should still act to limit second-round effects. The choice of instruments in this case would be the same. Persistent food price inflation may trigger wage increases which if excessive can lead to additional inflationary pressures or wage-price spiral. Wage growth should be monitored when considering policy options.
- **Fiscal policy is an important policy lever to control inflation.** Given the limited monetary options available, the Government will also need to consider fiscal policy options when second round effects emerge or if the economy shows signs of overheating as it did in 2007. The Government has been running cash surpluses in 2007 and 2008 as reflected in accumulating deposits in the banking systems. This policy stance is appropriate, although on hindsight there may have been a case for a stronger anti-cyclical fiscal policy stance in 2007 when private sector credit was expanding at unprecedented rates. Under the current exchange rate regime, these types of fiscal actions would also work faster than monetary policy to reduce inflationary pressures originated from the demand side.
- Currently, the movement of non-tradable goods in PP-RPI is dominated by rents due to its large weight. Better measures of non-tradable price movements will help improve core inflation measure and hence domestic policy formulation in controlling inflation.

Long term

25. It is essential to enhance the effectiveness of monetary policy in controlling domestic inflation. The NBC will need to expand its instruments in addition to reserve requirement ratio and other available administrative measures. Below are some general principles that the government would need to consider if it decides to expand the role of monetary policy and instruments recognizing this is a longer term effort.

26. **Central banks in emerging countries have increased their reliance on money market operations in conducting monetary policy as their financial sector becomes more developed.** International experience suggests that the move towards money market instruments for the conduct of monetary policy requires three initial conditions to be fulfilled;

- i. continued sound fiscal policy;
- ii. sound and competitive financial system with adequate supervisory framework; and
- iii. operational capacity and a sufficient degree of institutional autonomy of the central bank.

27. **Fiscal discipline.** Continued fiscal discipline is key to improving monetary policy effectiveness because the lack of it often undermines the development of government security market required for monetary operation, limits central banks influence on overall liquidity condition, and generate excess demand and inflation. In an economy with an early stage of financial development, the central bank may not be able to withdraw excess liquidity created by fiscal imbalance due to limited options to conduct monetary operations.

28. **Financial sector reforms.** Measures to deepen the financial system will also need to continue to the next stage. Until the credit function of the commercial bank has developed, there is limited scope for money market operation. Once bank's credit function has expanded, there will be a need for the interbank market to grow. As interbank market deepens, NBC can gradually shift the balance of its instruments from rule-based to money market operation. A number of factors could hinder interbank market development, including the weak financial position of the participants, market segmentation, and chronic excess liquidity associated with lack of fiscal discipline or other structural issues.

29. **Institutional capacity.** Enhanced operational capacity and a sufficient degree of institutional autonomy of the central bank will boost credibility and monetary policy effectiveness. This will establish single/clear objective of the central bank and appropriate balance between fiscal and monetary policies in the process of macroeconomic policy formulation.

30. **Medium-action plan.** To establish these three initial conditions in the longer term, the paper suggests that NBC take stock of existing market infrastructure, develop action plan to address existing weakness, and adjust the mix of monetary policy instruments as progress is made. In this context, this report recommends NBC develop a medium term action plan for developing its mix of monetary instruments, which would include actions to stimulate the development of an interbank market. Long run issues to consider include: (1) feasible set of market instruments such as reverse repurchase agreements with banks and role of treasury bills and its fiscal implications; (2) choice of feasible currency to denominate the market instrument; and (3) actions for capacity development in administering open market operations.

Mitigating the effects on poor and vulnerable families

31. **Fiscal policy.** Governments may use fiscal policy to provide temporary relief to poor families from high prices induced by supply-side shocks. In designing relief measures, lessons from other countries suggest the following:

- Indirect tax relief – such as exempting food from VAT or other taxes – is a poorly targeted relief measure. Once exemptions are given, they prove politically difficult to remove in the future. Given that Cambodia has a low tax rate to GDP (i.e., low taxed economy), tax relief measures are not recommended.
- Export bans or export taxes on food commodities redistribute gains from farmers to consumers and are not recommended as such restrictions undermine longer term domestic supply.
- Food subsidies are poorly targeted subsidies and costly as inefficient distribution systems are built around such subsidies. These are not recommended except in a food emergency situation
- Direct social assistance programs – primarily cash transfers– are more effective in reaching target groups and generally cheaper to administer. Cash transfers are faster to disburse. The Indonesian government implemented a temporary unconditional cash transfer program to compensate families for fuel price increases in October 2005. It took the Government about three to six months to set up and distribute the first cash payment to recipient families. The government re-activated the UCT in mid-2008 in response to the surge in commodity prices and domestic inflation. The UCT program covered 19 million households based on the database used in the previous UCT in 2005 and 2006. Each household received \$10 per month on a quarterly basis. Preliminary data about the antipoverty effectiveness of the UCT is encouraging. According to data from the 2008 Indonesian family social and economic survey, the UCT had maintained welfare levels of 60 percent of household UCT recipients, assisted 30 percent of recipient households to escape from poverty, while about 10 percent of recipient households fell into poverty due to food price inflation in 2008.

32. **The conditional cash transfer program is also an effective way to compensate families while at the same time building human capital in poor families.** The CCT program is the same as the UCT except it provides financial assistance to families under certain conditions that build human capital of children such as linked to education and health outcomes. In effect the program rewards families for changing behavior, such as enrolling and keeping children at school, or remaining up-to-date with child immunization program. To establish a CCT may take time if institutional capacity to administer one is weak. It requires establishing an effective, time intensive monitoring system with facilitators. It also requires robust poverty targeting instruments to identify poor. It also requires an effective and enforceable governance framework. Indonesia is currently piloting a CCT with about 1 million recipient families. It will take time to establish the institutional setting before it can be effectively rolled out on a national basis.

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Table 1.1: Cambodia: items and Weights in CPI Basket, 2003–2008

No	Item	Weight	Item	Item	Weight	
001	Rice1 1/ 2/ 3/	2.641	077 Monosodium 1/ 2/ 3/	0.290	153 Pillow	0.005
002	Rice2 1/ 2/ 3/	4.058	078 Soy sauce 1/ 2/ 3/	0.245	154 Pillow case	0.004
003	Bread 1/ 2/ 3/	0.584	079 Fish sauce 1/ 2/ 3/	0.255	155 Towel	0.006
004	Fermented rice 1/ 2/ 3/	0.415	080 Ground black pepper 1/ 2/ 3/	0.045	156 Generator, Yamaha 900	0.068
005	White rice 1/ 2/ 3/	0.280	081 Ginger 1/ 2/ 3/	0.030	157 Refrigerator,Thai	0.019
006	Yellow Nodle 1/ 2/ 3/	0.610	082 Tea 1/ 2/ 3/	0.461	158 Sewing machine china	0.009
007	Biscuits 1/ 2/ 3/	0.061	083 Coffee 1/ 2/ 3/	0.246	159 Electric fan, national Thai	0.017
008	Rice cakes 1/ 2/ 3/	0.197	084 Ice 1/ 2/ 3/	0.725	160 Flat iron, national Thai	0.007
009	Pork without 1/ 2/ 3/	2.401	085 Cooked rice 1/ 2/ 3/	3.683	161 Glasses, Thai	0.011
010	Pork with fat 1/ 2/ 3/	1.331	086 Snacks 1/ 2/ 3/	0.464	162 Plates, China	0.015
011	Beef 1/ 2/ 3/	1.059	087 Prepared meal 1/ 2/ 3/	0.905	163 Cooking pots	0.000
012	Chicken 1/ 2/ 3/	2.004	088 Canned soft drinks	0.511	164 Tea pots	0.002
013	Roasted pork 1/ 2/ 3/	0.285	089 Fruit juices	0.265	165 Kitchen knives	0.002
014	Roasted/fried chicken 1/ 2/ 3/	0.228	090 Angkor	0.321	166 Frying pan	0.001
015	Mud fish (large) 1/ 2/ 3/	1.570	091 Tiger	0.749	167 Bowls, China	0.002
016	Mud fish (small) 1/ 2/ 3/	1.432	092 Rub keylakas	0.206	168 Hoe China	0.004
017	Cat fish 1/ 2/ 3/	0.545	093 Toro, SKD	0.181	169 Axe, Cambodia	0.002
018	Sea fish (small) 1/ 2/ 3/	0.073	094 Local tobacco, Rubsek	0.362	170 Screw driver, China	0.002
019	Shrimps 1/ 2/ 3/	0.111	095 Imported, fine	0.981	171 Laundry soap/ fao, Thai	0.139
020	Crabs 1/ 2/ 3/	0.084	096 Other tobacco	0.065	172 Incandescent	0.015
021	Other fresh fish 1/ 2/ 3/	0.040	097 Cotton fabric (plain) white	0.016	173 Fluorescent national, Thai	0.038
022	Smoked fish 1/ 2/ 3/	0.126	098 Others	0.038	174 Insect spray red, USA	0.039
023	Cheese fish 1/ 2/ 3/	0.279	099 Scarfs	0.010	175 Matches, Vietnam	0.012
024	Dried fish 1/ 2/ 3/	0.979	100 Sarong	0.016	176 Brooms, Cambodia	0.012
025	Canned fish 1/ 2/ 3/	0.088	101 Men's shirts, long-sleeved	0.313	177 Doctor's fees (general practitioner)	0.626
026	Dried shrimps 1/ 2/ 3/	0.094	102 Pants / trousers	0.333	178 Dental fees	0.199
027	Chicken eggs 1/ 2/ 3/	0.070	103 MaleT-shirts	0.027	179 Daily hospital rate	0.475
028	Duck eggs 1/ 2/ 3/	0.757	104 Socks	0.023	180 Vitamin C	0.442
029	Fermented eggs 1/ 2/ 3/	0.181	105 Dress, street dress	0.066	181 Asprine	0.442
030	Condensed Alaska Milk 1/ 2/ 3/	0.638	106 Blouse, long-sleeved	0.290	182 Paracetamol	0.442
031	Powdered milk 1/ 2/ 3/	0.222	107 Skirts	0.225	183 Diarrhea France	0.442
032	Ice cream 1/ 2/ 3/	0.119	108 Underwear (panties)	0.085	184 Cough medicine	0.442
033	Vegetable oil 1/ 2/ 3/	0.174	109 Pantsuits	0.112	185 Antibiotics	0.442
034	Pork fat 1/ 2/ 3/	0.628	110 Pants / shorts	0.037	186 Bandage	0.004
035	Trakun 1/ 2/ 3/	0.353	111 Shirts / t-shirts	0.022	187 Plaster	0.004
036	Cabbage leaves 1/ 2/ 3/	0.052	112 Dress	0.023	188 Eyeglasses	0.075
037	Lettuce, spinach 1/ 2/ 3/	0.460	113 Blouse/ top / t-shirts	0.034	189 Rubbing	0.004
038	Onion leaves 1/ 2/ 3/	0.213	114 Diapers, Thai	0.008	190 Bicycle Thai	0.285
039	Other (mustard leaves) 1/ 2/ 3/	0.022	115 Leather shoes	0.228	191 Motor Scooter Thai	2.378
040	Tomatoes 1/ 2/ 3/	0.199	116 Vinyl shoes	0.021	192 Gasoline 2/	1.729
041	White gourd 1/ 2/ 3/	0.181	117 Slippers	0.040	193 Diesel fuel 2/	0.101
042	Cucumbers 1/ 2/ 3/	0.275	118 Leather shoes	0.105	194 Motor oil 2/	0.262
043	Bitter gourd 1/ 2/ 3/	0.100	119 Slippers	0.049	195 Tires (bicycle), Cambodia	0.324
044	Ridge gourd 1/ 2/ 3/	0.079	120 Slippers (children) Thai	0.016	196 Tubes size 650	0.120
045	Bell pepper, sweet 1/ 2/ 3/	0.046	121 Dressmaking (long-sleeved)	0.017	197 Tricycle fare 3/	0.455
046	Egg plant 1/ 2/ 3/	0.040	122 Tailoring 's men (long-sleeve	0.007	198 Motorcycle fare 3/	2.453
047	Onions 1/ 2/ 3/	0.083	123 Thread	0.006	199 Bus fare 3/	0.094
048	Cauliflower 1/ 2/ 3/	0.141	124 Needle for hand sewing	0.026	200 Postage stamp	0.057
049	Other 1/ 2/ 3/	0.045	125 Rental value of owner housin	26.983	201 Postage stamps	0.405
050	Traov 1/ 2/ 3/	0.091	126 Rental value of free house	0.347	202 Television, Japan	0.460
051	Sweet potatoes 1/ 2/ 3/	0.149	127 Nails	0.035	203 Video cassette	0.128
052	Potatoes 1/ 2/ 3/	0.116	128 Lumber	0.035	204 Radio, China	0.070
053	Bean sprouts 1/ 2/ 3/	0.049	129 G.I. Sheet	0.035	205 Rental of video tapes	0.079
054	Long greens 1/ 2/ 3/	0.138	130 Plywood	0.035	206 Film developing / printing	0.128
055	Short green 1/ 2/ 3/	0.149	131 Cement	0.066	207 Children's bicycle, Thai	0.056
056	Green gram 1/ 2/ 3/	0.044	132 Gravel	0.066	208 Cassette tape c60	0.008
057	Cucumber pickles 1/ 2/ 3/	0.392	133 Sand	0.066	209 English Classes	2.882
058	Banana 1/ 2/ 3/	0.633	134 Plumbing	0.074	210 Books two class	0.722
059	Oranges 1/ 2/ 3/	0.604	135 Electrical wire	0.023	211 Pencil, China	1.239
060	Pineapple 1/ 2/ 3/	0.071	136 Switch / receptacle	0.023	212 Ball pen, Thai	0.024
061	Lime 1/ 2/ 3/	0.111	137 Paint for wood	0.032	213 Paper (A4) Indonesia	0.118
062	Papaya 1/ 2/ 3/	0.077	138 Thinner	0.032	214 Rasmey Kampuchea	0.333
063	Apples (red) 1/ 2/ 3/	0.117	139 Daily wage campainter	0.051	215 Toilet / bath soap lux, Thai	0.091
064	Grapes (red) 1/ 2/ 3/	0.085	140 Water charges	1.406	216 Shampoo Pamoleive	0.196
065	Rambutam 1/ 2/ 3/	0.182	141 Electricity	1.843	217 Toothpaste close up, Thai	0.172
066	Durian 1/ 2/ 3/	0.279	142 Candles	0.090	218 Toothbrush	0.037
067	Water melon 1/ 2/ 3/	0.172	143 Liquid fuels (kerosene) 2/	0.306	219 Powder Pheset, Thai	0.073
068	Jackfruit (ripe) 1/ 2/ 3/	0.069	144 Firewood	0.936	220 Perfumes Cong kork, Thai	0.027
069	Tamarind 1/ 2/ 3/	0.191	145 Charcoal	0.863	221 Razor blades Bic	0.012
070	Coconut 1/ 2/ 3/	0.326	146 Sofa set, made of wood	0.042	222 Cologne, Cambodia	0.094
071	Peanuts 1/ 2/ 3/	0.130	147 Chairs, made of wood	0.021	223 Sanitary	0.097
072	Granulated 1/ 2/ 3/	0.308	148 Beds, wood	0.041	224 Hair setting for women	0.108
073	Brown sugar 1/ 2/ 3/	0.281	149 Wardrobe	0.030	225 Haircuts for men	0.273
074	Sugar products 1/ 2/ 3/	0.030	150 Mat	0.036	226 Haircuts for women	0.069
075	Salt 1/ 2/ 3/	0.082	151 Blankets	0.023	227 Wristwatch, Japan	0.933
076	Garlic 1/ 2/ 3/	0.154	152 Mosquito net	0.031	Total	100

Sources: National Institute of Statistics; and staff calculations.

Note: C-EF excludes 1/; C-EFF excludes 1/ and 2/; and C-EFFT excludes 1/, 2/, 3/.

Table 1.2: Cambodia: Alternative Measures of Inflation, January 2003–July 2008

Month	Headline	C-EF	C-EFF	C-EFFT	Month	Headline	C-EF	C-EFF	C-EFFT
Jan-03	1.4	0.4	0.1	0.0	Nov-05	6.7	3.4	2.4	2.0
Feb-03	1.8	0.5	0.2	0.1	Dec-05	6.7	3.3	2.3	1.9
Mar-03	2.1	1.1	0.5	0.3	Jan-06	6.3	3.0	1.9	1.4
Apr-03	1.2	0.9	0.3	0.2	Feb-06	6.2	2.8	1.7	1.2
May-03	1.9	1.0	0.6	0.4	Mar-06	5.9	2.8	1.9	1.4
Jun-03	1.7	1.2	0.9	0.7	Apr-06	4.8	2.9	1.9	1.4
Jul-03	1.1	0.7	0.5	0.3	May-06	4.9	3.1	2.0	1.5
Aug-03	0.8	0.9	0.6	0.1	Jun-06	3.8	3.4	2.3	1.8
Sep-03	0.5	0.7	0.4	0.0	Jul-06	5.1	4.0	3.0	2.4
Oct-03	0.6	0.7	0.4	0.0	Aug-06	5.1	4.1	3.3	2.6
Nov-03	0.5	0.8	0.5	0.0	Sep-06	4.4	3.9	3.2	2.6
Dec-03	0.5	0.8	0.5	0.1	Oct-06	4.1	3.4	2.9	2.5
Jan-04	0.6	0.8	0.5	0.1	Nov-06	3.2	3.4	2.9	2.5
Feb-04	0.8	0.9	0.5	0.1	Dec-06	2.8	3.3	2.9	2.4
Mar-04	0.9	0.8	0.6	0.1	Jan-07	2.6	2.8	2.8	2.4
Apr-04	1.6	0.9	0.6	0.1	Feb-07	2.9	2.8	2.8	2.4
May-04	2.1	1.3	0.7	0.2	Mar-07	3.5	2.7	2.7	2.2
Jun-04	3.0	1.8	1.0	0.3	Apr-07	4.0	2.7	2.9	2.4
Jul-04	6.0	2.5	1.8	1.2	May-07	4.1	2.8	2.8	2.3
Aug-04	6.7	2.7	1.8	1.1	Jun-07	5.6	2.4	2.6	2.0
Sep-04	7.4	2.8	2.0	1.2	Jul-07	6.5	2.7	3.0	2.5
Oct-04	6.0	3.2	2.3	1.3	Aug-07	5.2	1.6	1.9	1.5
Nov-04	5.8	3.2	2.3	1.3	Sep-07	6.4	1.4	1.7	1.5
Dec-04	5.6	3.3	2.4	1.4	Oct-07	8.7	2.2	2.2	1.7
Jan-05	5.8	3.5	2.8	1.8	Nov-07	9.5	3.2	2.8	1.7
Feb-05	5.6	3.8	3.2	2.3	Dec-07	10.8	3.8	3.2	1.9
Mar-05	5.4	3.7	3.1	2.3	Jan-08	13.7	6.8	5.8	4.8
Apr-05	5.9	3.8	3.0	2.3	Feb-08	15.5	7.3	6.2	5.1
May-05	6.3	3.7	3.1	2.3	Mar-08	20.3	8.5	7.0	5.7
Jun-05	7.0	3.7	2.9	2.3	Apr-08	24.2	8.7	7.2	5.8
Jul-05	4.1	3.1	2.2	1.5	May-08	25.7	9.3	7.6	6.1
Aug-05	4.5	3.3	2.3	1.6	Jun-08	25.1	10.3	7.8	6.4
Sep-05	5.0	3.6	2.5	1.7	Jul-08	22.3	9.4	6.9	5.5
Oct-05	6.4	3.5	2.4	1.9					

Sources: National Institute of Statistics; and staff calculations.
Note: C-EF = Core inflation excluding food; C-EFF = Core inflation excluding food and fuel; and C-EFFT = Core inflation excluding food, fuel, and transport;