

Core Inflation Indicators in Timor Leste:

“Should we be concerned with Headline Inflation and CPI basket to monitor inflation trends?”

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1. Introduction

This working document is the first of a series of technical documents to be produced by the Economics Division that intends to progressively upgrade BCTL’s analytical framework to assess economic trends and policy options in Timor Leste. So as to maximize the readability and usefulness of the series, it was deemed appropriate that these documents should follow a synthetic and intuitive approach, avoiding the use of complex economic and econometric theories and methods. This concern greatly reduces the “scientific worth” of the documents, but, hopefully, will allow the discussion to gain a wider audience, while still delivering a sounder understanding of the different economic themes.

The documents will lean on the different themes on a stand-alone basis, so as to focus the discussion and ease the reader’s load. Although each theme is approached separately, the series intends to improve, through its different issues, the overall comprehension of the economic context of Timor Leste. This will be done sequentially, exploring themes that reinforce each other so as to have a more in-depth view of the more relevant domestic economic themes. This series will specifically look into various broad themes, such as: inflation trends and determinants, economic cycle developments and analysis, economic policy options and framework, financial sector development and trade balance and general balance of payments analysis.

This first technical document explores the recent inflation trends in Timor Leste and proposes appropriate indicators to assess price pressures on a timely basis. Although the country is a completely dollarized economy, which puts money supply outside of the country institutions’ reach - a traditional determinant of inflation - it is still very relevant to monitor inflation trends and develop an economic

policy framework that fosters low and stable inflation, which is one of the necessary conditions for the socio-economic development of Timor Leste.

Having a fully dollarized economy does not mean that the domestic inflation rate should closely track US inflation pattern, as the last 10 years have clearly showed for Timor. There are other economic factors playing this game, being the more noteworthy, aggregate supply elements, import price trends, domestic fiscal policy and domestic economic developments. These have made inflation trends diverge from what should be generally expected, given a *formal* dollarized economy.

BCTL thus finds itself today in a context, in which it has recourse to very few policy instruments and thus cannot be formally responsible for attaining typical macroeconomic stabilization objectives, such as low and stable inflation. Nonetheless, the Bank still has the possibility to use other non-standard policy tools towards that end.

One of those instruments is a clear and informed communication strategy towards prices and inflation trends. By developing a sound understanding of domestic economic developments, via better statistics, monitoring tools and economic modeling efforts, the Bank will certainly have a more informed view of inflation trends. This will enhance the clearness of BCTL's communication strategy and provide for a more assertive contribution towards the definition of an appropriate domestic economic policy, specifically on the field of fiscal policy. Another practical benefit of a clear communication strategy is to contribute to anchoring domestic inflation expectations, which normally carry a significant weight in determining domestic inflation trends.

The theme explored in this document relates directly to this top-level concern. Specifically, we intend to dig on the details of the price data disclosed by DNE in order to build a set of indicators that might be more useful to gauge overall price pressures in the economy, than the traditional set of indicators disclosed by the monthly DNE's inflation reports. This quest led us to develop the first set of core inflation indicators for Timor Leste.

Although the headline inflation rate is generally a very important statistic to understand overall price and economic developments, we note that in the case of Timor Leste, due to huge weight of single item food expenditure items and existence of significant domestic supply restrictions, the overall inflation might be distorted making it a poor indicator of general price trends. Additionally, the huge weight of food expenditure in the CPI in Timor Leste, together with the high volatility of food prices, contribute to make the headline inflation a poor measure of overall price trends. These elements increase the presence of noise in headline inflation data that obscures true price developments in the economy.

As such, especially in the case of Timor, from the perspective of macro-economic stabilization efforts, specifically of price stabilization, the concern should not be on CPI's based headline inflation, but on general price trends for the various goods and services transacted in the economy. That's why it might make more sense to consider indicators that better account for general price trends for the different items. Hardly, there would be a single magic indicator that could be used to monitor inflation trends, that's why we consider a set of core inflation indicators, preferring also simple indicators to more complex ones, which are easier to compute and communicate.

2. Some Facts on Domestic Price Statistics

'Direcção Nacional de Estatística' (DNE) is the public institution responsible for collecting, compiling and disclosing price and inflation statistics for Timor Leste. It has been doing so for the last decade and we have now more than 10 years of price data available to analyze price trends.

DNE has, until December 2012, published price data for 2 Consumer Price Indexes (CPI), which will be referred together as the "old" CPIs. The Dili CPI is based on a consumer basket representative of Dili consumers which has been published on monthly basis, since December 2001. The National CPI has been published on a quarterly basis only, since June 2003 and is based on the prices collected for the expenditure items representative of the average national consumer. Both consumer baskets are based on a Household Expenditure Survey referring to 2001, which might cause the overall CPI prices until 2012 to be a poor guide on consumer inflation in Timor Leste. Additionally, from what can be guessed from ad-hoc evidence, the old CPI was compiled based on a variable expenditure weights. This was done as a remedial procedure for the lack of consumer basket update, by increasing the weight of items with greater inflation rates, but clearly departs from standard best practice in this context.

These details and other doubts related to the robustness of the old price gathering methodologies force us to proceed with caution in looking at historical CPI and inflation data until December 2012. These notes are another justification for preferring statistics based on generalized price trends across different goods and services to CPI headline inflation while analyzing historical price trends in Timor.

At the end of 2012, there has been a major upgrade in the way the CPIs are compiled, as the: consumer baskets were updated, according to the data collected by the 2011 Household Expenditure Survey, some consumer expenditures items were reclassified, a third CPI was introduced for Timor excluding Dili and all 3 CPIs are now published on a monthly basis. This development will certainly improve the quality of price statistics, as will other still much awaited developments, such as the compilation of: tradable and non-tradable items price indexes, import price indexes and producer price indexes.

On the downside, this substantial change in the consumer baskets and expenditure reclassification makes historical comparisons more difficult as the old CPI data is not really consistent with the new CPI data. This should be particularly relevant for any proper analysis of historical inflation trends and inflation modeling or forecasting efforts. On a practical perspective, further work could be done to construct price time series consistent with the new CPIs, but further information is still needed from DNE, who has reluctantly shared detailed price information with BCTL. As an example, if DNE could share with BCTL the detailed CPI consumer basket weights and prices - with a 3 digits decomposition - for the new CPI, we could calculate historical CPI series consistent with the new CPI, as BCTL has already detailed price data until the end of 2012.

Additionally, this break in the price series data, could be another argument for using broad general price statistics instead of headline CPI data. These broad general indicators, or core inflation indicators, minimize the dependency on the CPI basket composition, as they are built to capture the across-the-board price trends in the economy and are thus less dependent than the standard CPI on idiosyncratic price movements and single item weights. By construction, they facilitate the historical consistency of price statistics and are thus considerably less affected by the introduction of the new CPIs.

3. Methodological Issues

Given the importance of methodological issues in any applied economic work, this section details the more relevant assumptions used along this document.

If not pointed otherwise, the price data used in this documents refers to Dili CPI data, as: it has a longer history, going back to 2001; has been always published on a monthly basis; and the national CPI has closely tracked the Dili CPI throughout the last decade.

All price or inflation statistics not directly disclosed by DNE, such as headline and food inflation, **were computed based on CPI level 2 categories price data.** The old CPI contained 30 such categories and the new version of the CPI includes 35. For example, when we refer to average inflation rates, it means average inflation rates across all these level 2 CPI categories. In theory, using all individual items price data (on a detailed 3 digit level) should make the reported measures more robust and adequate to reflect broad price trends in the economy. This was not yet possible, as DNE as still not provided us (BCTL) individual price data up to 2007 and also from December 2012 onwards. Additionally, as DNE has traditionally not shared this individual price data on a “timely basis”, it seemed more appropriate and robust to build our statistics with the price data normally available on a timely monthly basis, which includes only headline, level 1 and level 2 price and inflation data.

Our preferred measure to analyze price trends in the economy is the year-on-year inflation rates registered on a quarterly basis. This measure corresponds to the yearly percentage change in prices of the different expenditure items comparing the same quarter in sequential years. **Additionally, we prefer to use average quarter CPI values, instead of the end of the quarter CPI values,** as this takes out a substantial part of the noise in quarterly price data¹. All together, we think that this inflation measure should make the data more stable, without losing much signal; more robust to seasonal and calendar effects; and easier to analyze graphically.

Although we prefer to report our results on a yearly inflation rate basis, our calculations were based on sequential quarterly inflation rates. This was done in order to accommodate the impact of the introduction of the version of the CPI at the end of 2012. Since DNE did not recalculate CPI figures for 2012 consistent with the new CPI, the CPI data reported for 2013, does not allow us to compute direct year-on-year inflation figures. It was thus thought appropriate to overcome this issue by basing our calculations on quarter on quarter inflation rates, which are directly disclosed or computable for the new CPI². **The year-on-year figures were thus computed as the cumulative 4 quarters inflation rates, which allow us to consistently combine old and new CPI data.**

Occasionally we might refer to the terms of price or inflation instability, which relates to the need to separate the signal from noise in the price data. Given that prices or inflation rates of certain expenditure items - the most noteworthy are generally food and energy prices - vary substantially across time and most of the time on an idiosyncratic basis without much influence from economic fundamentals. Thus, we might conclude that the prices of these items should be underweighted in indicators that try to assess general inflation trends. This idea is a clear foundation of our approach. Note also that **a simple measure of price stability used in this document is the standard deviation of inflation rates for a certain item or expenditure class,** which assesses the degree of variability of inflation versus its average rate. The higher the standard deviation the higher the degree of variability in prices and so the lesser the information content of this item or class for assessing overall inflation trends in the economy.

As it is never too much to offer views on how to improve the quality of our work, we think that having more information, on a timely basis, on individual price data is a clear way forward to improve these inflation measures. These prices could also be used to compile BCTL customized price indexes directed

¹ The quarterly average CPI corresponds to the average of the CPIs registered during the 3 months of the quarter. The end of the quarter CPI value corresponds to the level registered in the last month of the quarter. Given these definitions, it is clear the quarterly average CPI is a more stable measure of prices which is particularly needed in the case of Timor, given the wide variability of prices on a monthly basis.

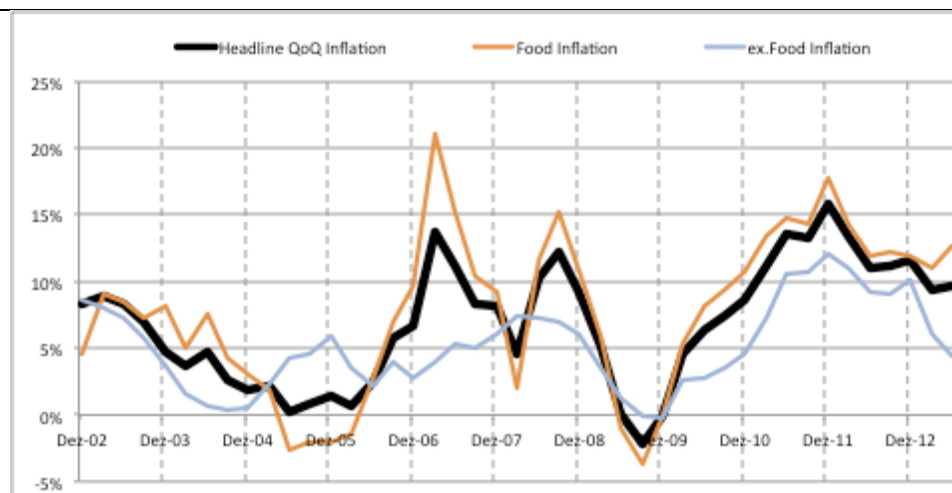
² Note that for the new CPI, we assume that the average CPI for the last quarter of 2012 amounts to 100, the same value stated for December 2012.

at assessing trends for: imported and domestically produced products; different categories of products, according for example to their economic function. Within this context, it might be also highly relevant in terms of economic analysis to think about collecting detailed price data for other important economic aggregates. Among these, wage data represent a serious candidate as they generally constitute a fundamental driver of firms costs structure and thus pricing decisions, a fact we hope to check in Timor Leste.

4. Historical Inflation trends

Given the above methodological issues, we proceed by having a look at the historical domestic inflation cycle. The following graphic depicts the yearly headline inflation rate as well as the food and non-food items inflation rates.

Chart 1 - Year-on-Year Inflation rates - Headline, Food and Non-Food Inflation



Source: DNE data and BCTL calculations

As is clearly shown, food inflation is the fundamental driver of headline or overall CPI based inflation rate, as headline inflation closely tracks the movements in food inflation. This is mostly due to the substantial weight of food expenditure items in the CPI basket - 56.7% and 62% in the former and present versions of the Dili CPI - but also to the greater size and variability of food inflation rates, compared with non-food inflation rates, as can be seen below.

This simple observation makes one think that headline inflation might be a very poor guide of overall price pressures for Timor Leste economy, as food prices have an overwhelming influence on headline inflation, obscuring general price trends that should be the main concern from an economic stabilization policy perspective. This does not mean we should completely ignore headline inflation rates, but that, as a measure of generalized price pressures, they can be mostly uninformative.

Table 1 - Inflation Rates for the various Expenditure Classes - Yearly Averages and Variability

	Avg Infl. Rate	Stdev. Infl. Rate		Avg Infl. Rate	Stdev. Infl. Rate
Overall CPI	7%	8%	Non-Food Classes:		
Food	8%	11%	Alcohol & Tobacco	6%	14%
Non-Food	2%	2%	Clothing	10%	12%
			Housing	6%	8%
			Household	1%	6%
			Health	5%	7%
			Recreation & Education	2%	7%
			Transports & Telcos	6%	16%

Source: DNE data and BCTL calculations

Headline inflation rates are still highly relevant for other realms of economic assessment and policy formulation as they effectively determine consumer purchasing power and affect overall economic developments. As such, it should remain under the vigilance of economic authorities and if acute episodes are registered, especially if caused by price movements in a few number of items, it should be targeted appropriately with policies designed to mitigate the respective economic impacts.

Food prices are everywhere in the world inherently volatile, as they are more substantially affected by supply-demand imbalances, and heavily dependent on seasonal issues, weather and climatic developments. Given the high degree of perishability of food items, the relatively insufficiency of domestic agricultural production and lack of a proper logistic system than efficiently connects producers with the markets, reinforce this aspect in the case of Timor.

Given the high variability of food inflation, which is clearly visible during the 2007-2008 period, any analysis of inflation trends based on headline inflation will be mostly wrong-footed, as the headline inflation rate jumps up and down without showing any particular trend. Note also that the volatility of domestic food inflation, and consequently of headline inflation, is also due to large impact of certain food items, being the most noteworthy cereals and, specifically, the rice price, which has a substantial weight in both food and overall consumer baskets - 15% weight in the new CPI basket. This further confirms that food inflation and headline might be an erroneous indicator to monitor overall price trends.

On the contrary, non-food inflation displays a nicely behaved, stable pattern through time, which facilitates a more correct assessment of price trends. As can be seen above, non-food inflation shows 3 inflationary episodes along the last decade: a very short one in 2005; a more acute one in 2008; and a more extensive and durable one in 2011 and 2012. These episodes are also broadly in agreement with developments in economic fundamentals, as: 2005 was characterized by a short but relevant increase in

domestic economic activity and imported price pressures, specially of Indonesian origin; 2008, marked by a substantial increase of international energy and commodity prices and elevation of domestic economic activity on the back of a more robust fiscal policy; and 2011-2012 as the result of a substantially expansionary domestic fiscal policy stance and international price pressures, arising from a gradual overheating of regional economies and broad dollar depreciation.

Indeed, if we were only given the possibility to choose among these 3 indicators to monitor overall price trends, we would tend to choose non-food inflation as our core inflation indicator.

5. Core Inflation Indicators: an introduction

Gladly, we are not restricted to choose only amongst these 3 standard measures, but can also strive to tailor adequate statistics to monitor price trends across the economy, appropriately customized to Timor Leste's economic context. This section thus forms the backbone of our work and builds on the previous comments to propose a set of indicators that can be used to take the pulse on inflationary trends in the country.

In order to compile the monthly CPI figures, DNE collects every month a very rich dataset of prices that can be used to support our efforts. Although we don't have yet frequent and timely assess to the finer details of this dataset, we have, as the rest of the public, on a monthly basis, the prices for baskets of goods corresponding to 35 consumer expenditure classes³. Our proposal is to make full use of this data to create indicators that allow us to have a better peek at general inflation developments and respective trajectory.

Instead of relying on a consumer basket, or weighting the prices according to their importance to the consumer basket, we might consider that a simple average or median of inflation rates across all these 35 categories do offer a better view of price trends in the economy than headline inflation, as they are a central measures of the behavior of prices. Or we might find that the simple non-food inflation is a great measure of inflation trend.

In the end, we conclude sensibly that having a set of indicators is clearly preferable to having just one, as hardly there would be any magic statistic to solve our problem, especially given the yet experimental nature of our work. As more experience is accumulated we would gladly evolve towards having a preferred measure of core inflation, which will help to be more clear in our communication with other economic policy authorities and the general public.

³ The new version of the CPI contains 35 classes for level 2 expenditures. The previous version disclosed prices only for 30 expenditure classes.

Before we look at our proposals, let us just take a brief look at the methodologies normally used to compute core inflation, as we are certainly not the first needing to have an adequate core inflation indicator. This is actually a generalized concern, especially across central banks, who normally have a preferred measure of core inflation and which some actually use as target for their policy. It seems that this need is also felt strongly by our regional partners, as Indonesia and Singapore Central Banks are particularly focused on targeting their core inflation measures, in detriment to headline inflation rates.

According to the rich bibliography for this subject⁴, there are various popular measures to assess core inflation across the world. **The most common and also the easiest is simply to exclude food and energy prices while computing inflation rates.** This approach is very popular for many central banks, as it excludes items that are relatively volatile in nature and are many times highly distorting of overall inflation trends. This approach is mostly used by developed countries central banks, as food is not very important for consumer baskets and energy costs volatility's impact is minimized by these countries' organized and flexible industrial structure. In the case of developing countries, especially for countries Timor, excluding food prices altogether from core inflation would be a severe understatement of true inflation trends, as these items really do matter for developing countries' consumers. Other measures are also very popular.

Averages of inflations rates across different consumer items is also be used, but this approach is generally very affected if significant outliers exist, as they distort averages. This is a big concern in the case of Timor. **Using median rates could solve the problem of outliers' distortion**, but it will still lead to an incomplete view of general price trends, as the median corresponds only to the inflation rate of the item whose inflations is the median of all items' inflation rate in certain date.

The need to combine the pros and mitigate the cons of both average and median approaches has lead to the use of the concept of trimmed mean, which is very popular across many jurisdictions. This approach consists in computing the average of inflation rates for all consumer items, excluding a certain percentage of extreme observations, positive and negative, which are considered outliers. This approach minimizes the impact of outlier distortion, but forces the user to define the appropriate percentage of observations to be excluded from the average. In principle, this percentage could be calibrated according to a certain historical sample and is generally considered to be optimal to exclude no more than 15% of the overall price dataset.

Other widely used methods are also available, but could be more complex to estimate and, especially, to explain to the general public. **The principal component approach is one such example.** The idea is to estimate non observable factors that have great explanatory power over the observed inflation rates

⁴ See for example "Core Inflation: A review of conceptual issues" published in Federal Reserve Bank of St. Louis in 2008 and "Evaluating Measures of Core Inflation" published by the Bank of Canada in 2006.

for a large set of consumer items' inflation rates. The components are then ranked in terms of their explanatory power - correlation with the overall price sample variability - and a time-pattern for each factor is subsequently estimated. As advantages, this method can handle huge price databases and extract orthogonal factors, a very useful property for economic modeling. Being a purely statistically driven approach it generally estimates factors that hardly have a straightforward economic interpretation. Another more complex approach, also statistically driven **would be to estimate a core inflation measure that weighs consumer items inflation rates according to their volatility**, seeking to underweight volatile items and overweight more stable price items. The idea of this method is to downplay the influence of highly variable and uninformative price moves in order to have a clearer view at the true inflationary trends in the economy.

In addition, although these are not proper core inflation measures, other statistics can be also used to assess the degree of price changes across the economy. **Estimating for example the percentage of rising price items to total items** in the consumer basket can be very helpful to assess if price trends are generalized or are, on the contrary, only affecting a small part of items in the economy. The dispersion of inflation rates for the various consumer basket items can also inform us on the degree of "generalization" of price pressures. Note for example that high level of headline or average inflation rates coupled with a low degree of dispersion of inflation rates across all items tends to be associated with generalized price pressures in the economy.

6. Core Inflation: our proposals and historical overview

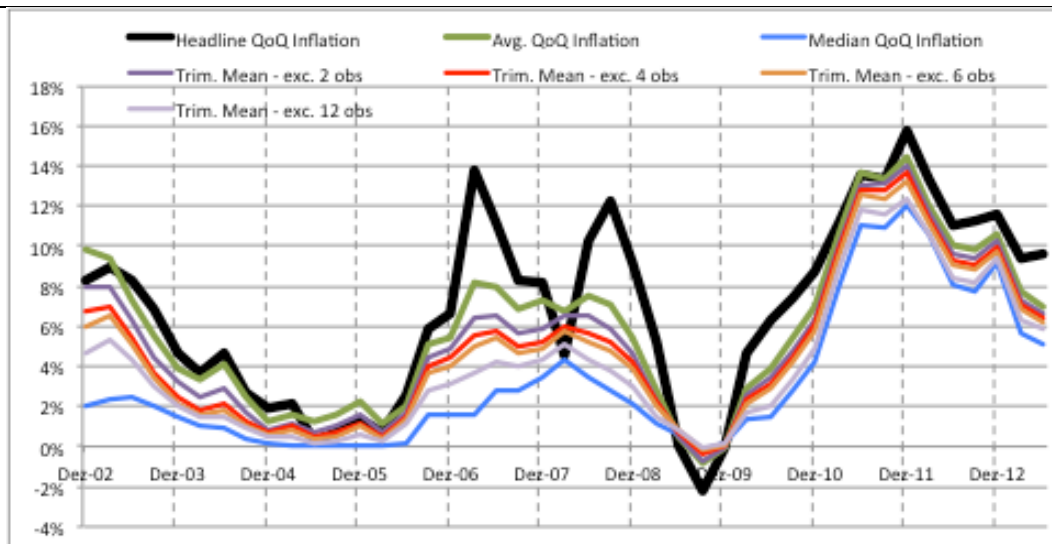
Given this succinct description of popular core inflation measures used throughout the world, we now proceed towards the presentation of the statistics that could be useful in this field for the case of Timor. As already stated, please note that we prefer to use at this stage, given the experimental nature of this work, a set of measures instead of a single best statistic. While it could lead to some confusion using so many measures, we think that it will, at this point, allow us to have a more informed view on the fundamental price developments occurring in our economy. If found useful, a dashboard report using these statistics could be prepared to monitor, on a timely basis, the price trends in Timor's economy.

Ours consists on a two steps approach. First, we consider being highly relevant in the case of Timor to monitor inflationary developments on 3 major levels: global, food and non-food levels. We consider this classification to be highly relevant in the case of Timor, given that food and non-food items have showed substantially different price patterns along the last decade and that we cannot altogether despise price developments for food items in Timor, despite their volatility, since they carry such a material weight in consumers' budgets. Additionally, the comprehension of price trends in food and non-food sectors is crucial to understanding overall price trends in Timor.

Given this 3 levels focused approach, the second step consists in computing different inflation measures for each level of concern. We do this by using average, median and trimmed mean - using in this case different levels for excluding outliers - statistics for each of the 3 levels. These statistics are also compared with headline overall, food and non-food items inflation, based on the CPI basket, as computed by DNE. We also present below a complementary and simple statistic that allow us to have a view on the degree of generalization in price pressures across the economy, which consists of the percentage of items experiencing a rise in prices in terms of total items considered.

The chart below confronts headline inflation (in black) with the various potential candidates to being core inflation indicators. As can be seen, all indicators seem to be more stable, or less erratic, than CPI based headline inflation, offering a better view of historical inflationary trends. This is especially evident for the years of 2007 and 2008. The huge increase in yearly headline inflation visible in the beginning of 2007, as a consequence of the country's political and social crisis back then and the subsequent decline in the beginning of 2008, is a clear proof of the unsuitability of headline inflation to analyze the true price pressures in the economy. The core inflation indicators seem to be generally better suited to such purposes, as they show a broadly rising trend during those years, but never such high volatility. Given its sensibility to extreme values, average inflation (in green) seems to be the worst indicator in terms of stability. Median inflation, on the contrary, shows a clear inflationary peak during that period in the beginning of 2008, just when headline inflation goes down substantially. The broad conclusion from such episode is that price pressures were evident during the period, but not to such a high degree as headline inflation would lead us to believe.

Chart 2 - Year-on-Year Inflation rates - Headline versus Core Inflation Measures



Source: DNE data and BCTL calculations

It is also very interesting to note that from 2010 through to 2012, headline has closely tracked core inflation indicators. This is clear evidence that, in this recent period, price pressures seem to be very generalized. Also noteworthy is to look at the substantial rise in median inflation to a level broadly in line with other inflation measures, which evidently signals the existence of generalized price pressures in the economy. According to this chart, we can also conclude that the inflationary episode of 2010-2012 seems to be much more concerning and deeply engrained in the price-setting mechanisms than during the 2007-2008 episode.

Although we have already reached some interesting conclusions using this top-level chart, we think that the analysis cannot be complete without looking further under the hood. This means, looking at the price trends for both food and non-food sectors. The charts below display the same statistics, now computed separately using food and non-food price inflation data for the same historical sample.

Year-on-Year Inflation rates - Headline versus Core Inflation Measures

Chart 3 - Food Inflation Measures

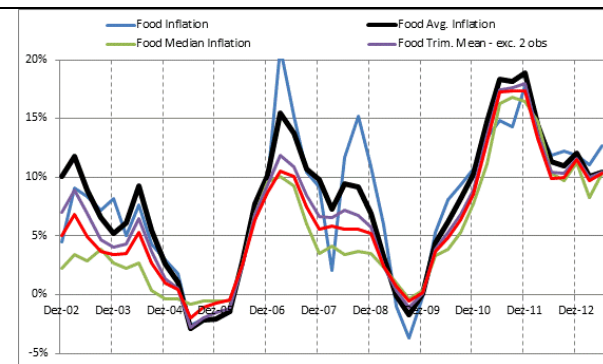
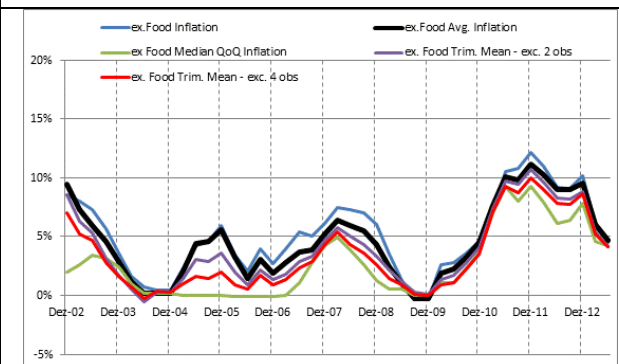


Chart 4 - Non-Food Inflation Measures



Source: DNE data and BCTL calculations

As can be seen, both charts do show that food and non-food inflation follow different patterns, where non-food inflation has generally been quite stable around a 5% yearly average - which should be expected given the present monetary arrangement for Timor - whereas food inflation has moved erratically and in an quite extreme way during the decade. The different core inflation measures allow us to have a more clear view at these trends, especially when we look at food inflation. **In fact non-food core inflation measures broadly agree with the trends visible for the simple non-food CPI based inflation.** For food inflation, core measures do allow a better view of underlying price developments, which is better illustrated during the 2007-2008 inflationary episode.

The 2 charts also show that food and non-food inflation have generally been following divergent paths, but that until 2004 and most importantly during 2010-2012 period they have showed a substantial positive correlation, although food inflation has clearly outpaced non-food inflation for this

episode. This evidence points also to the existence of generalized price pressures in the economic system for the last few years.

7. Developments in 2013

Given this broad explanation of historical inflation patterns, we think that our work could further benefit if used to understand the most recent price developments. The 2 charts below synthetize these trends, depicting inflation patterns from 2008 until June of 2013.

2013 Trends - Year-on-Year Inflation rates - Headline versus Core Inflation Measures

Chart 5 - CPI based inflation Measures

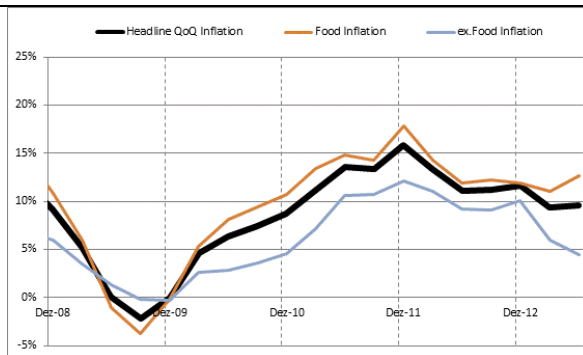
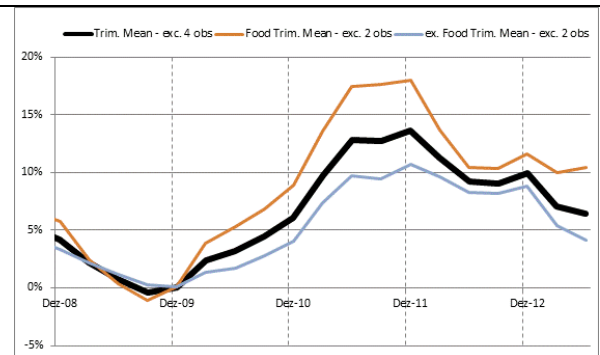


Chart 6 - Core Inflation Measures



Source: DNE data and BCTL calculations

The chart on the left shows the simple CPI based headline, food and non-inflation measures. As can be seen, overall inflation has remained very high and sticky around 10% for the first semester of 2013. This seems to be due to an increase in food inflation, which has mostly offset the benefit of a substantial decrease of non-food inflation. This observation still needs further confirmation, as we have repeatedly insisted throughout the document, that the intrinsic characteristics of Timor's economy can make CPI based inflation or price measures to be highly distortive as an instrument to assess real and broad price trends.

In fact, our proposed core inflation measures show a clear and significant decrease in the first 6 months of 2013. If you look at the chart on the right - where we have only included trimmed averages of yearly inflation to make it more simple - overall inflation has decreased from 10% at the end of 2012 to a more benign yet still high level of around 7% for the second semester of 2013. This seems to be the outcome of a substantial fall in non-food items inflation, as food's trimmed mean inflation has even increased in 2013. Thus, according to the proposed measures, there seems to be an ongoing moderation of generalized inflation pressures in Timor, despite of yet worryingly high price pressures for food items. The divergence between food and non-food inflation in 2013 and the subsequent distortion of

overall inflation figure published by DNE is another reminder of the caution that should be placed while looking at simple CPI based inflation figures, as they can seriously mislead our views of inflation trends.

While it is beyond the purpose of this document to discuss the determinants of these most recent trends, it seems that the moderation of inflation pressures might be due to the broad dollar appreciation versus regional currencies throughout the first semester⁵ and specially to the slower pace of domestic economic activity in 2013, due mostly to the slow execution of the public spending budget.

8. Conclusions

We hope that this simple work might be useful on two aspects. **The first is certainly on the caution that should be exercised while using the simple inflation measures published by DNE as an instrument to analyze price trends in Timor**, given the highly distortive impact of food inflation in our country. **A second benefit would be to offer some alternatives to those basic inflation indicators** that would allow the BCTL, the financial and monetary guardian of our economy, to have a more informed view on the real underlying domestic price trends.

While promising, we think that additional experience in monitoring these measures and work to improve their usefulness will be needed so as to have reliable and non-conflicting instruments to measure these real price trends. As we said already, we cannot decide yet on the most adequate core inflation indicator, preferring for now to deal with a set of indicators instead of a single one. With time and sufficient internal reflection we hope to be more confident on our core inflation measure, which will also help the BCTL to have a clearer communication strategy and contribute constructively to the objective of price stabilization in Timor.

Another very useful development would be to have a better data sharing agreement with DNE, as it has only reluctantly shared detailed price information with BCTL, often on a non-timely manner. Having more detailed price data, for example 3 digit price data for single items in the CPI, on a monthly timely basis would allow a great improvement of the proposed statistics and the set-up of customized price indexes to compare and assess price trends for various sub-sets of items - for example for items of domestic or imported origin and for services and goods expenditures. While other promising data-collecting initiatives would be very useful in this context - such as collecting wage rates on a structured and frequent basis - we think that improving access to price data collected with DNE would be a non-expensive and straightforward way to improve our contribute towards the stated objectives for this work.

⁵ This is a very interesting development, as Indonesia, our main economic partner - has been experiencing substantial price pressures in 2013.

As a final comment on the usefulness of this work, we would like to mention some relevant aspects of this work towards the undertaking of economic research at the BCTL. On a first level, we would mention that domestic inflation modeling or forecasting would probably benefit from modeling separately food and non-food inflation processes. As our work has shown, food and non-food inflation have exhibited materially different patterns throughout the last decade, which result from the interplay of different fundamentals. It thus seems that taking these specificities into account would yield better explanatory economic models. Additionally, it would be more adequate to combine the separate modeling approach of food and non-food inflation, measured with one of the proposed core inflation measures, as a way to minimize the impact of the change of the CPI methodology at the end of 2012 on future economic investigation efforts.

Another final consideration would be to note that CPI is a common deflator used to convert most nominal economic statistics to real economic data, especially for countries with a very basic statistical framework. In the case of Timor, the use of the CPI for such purposes would be very distorting, specially given the importance of food expenditures in the CPI basket and the material differences between food and non-food inflation trends. Such caution would be particularly advisable while using the headline CPI to deflate economic statistics not related to consumer spending expenditures, such as other domestic spending aggregates and indicators, as well as production or financial statistics.