Inflation Outlook

Quarterly Inflation Report

Carlos Viana de Carvalho

June 2018

Índice

I. Introduction

II. Baseline Scenario

i. Economic Activity

ii. External Scenario

iii. Inflation

III. Conditional Projections

I. Introduction

Banco Central do Brasil – Institutional Mission

- To ensure the stability of the currency's purchasing power and a solid and efficient financial system;
- The mission to ensure price stability is accomplished through the inflation targeting regime, in which the targets are defined by the National Monetary Council (CMN).

Basic Principles

- Low, stable and predictable inflation: best contribution of monetary policy for sustainable growth;
- High and volatile inflation:
  - creates distortions, increases risks, shortens planning horizons, depresses investment and economic growth;
  - is regressive;
  - in short, reduces potential growth, affects employment and income generation, and negatively affects income distribution.

II. Baseline Scenario

i. Economic Activity:

- difficulty in assessing recent evolution of economic activity due to the halt in the transportation sector;
- high level of economic slack;
- persistence of Brazilian economic activity recovery at a more gradual pace.

ii. Global Outlook:

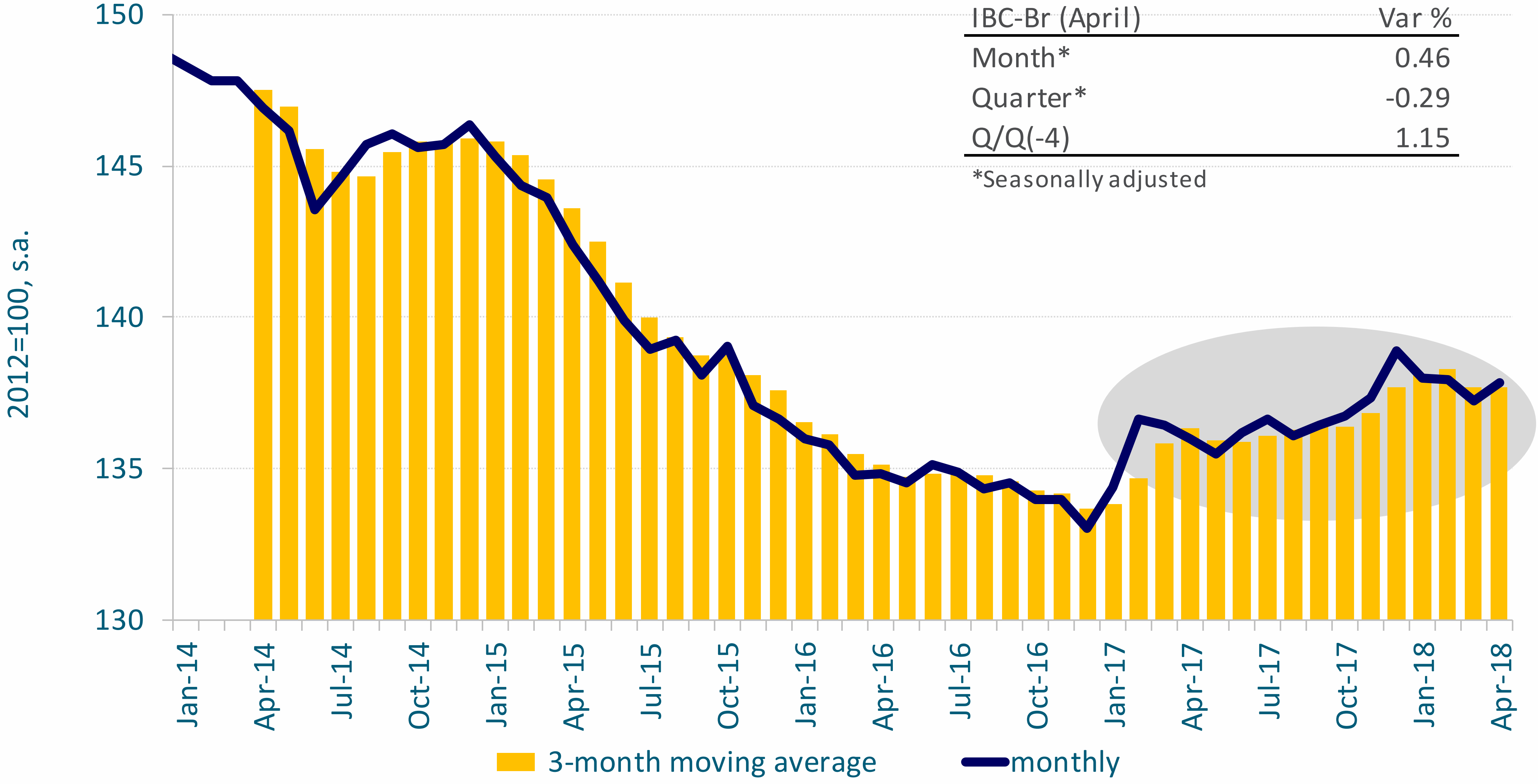
- became more challenging; volatility;
- risks associated to the normalization of interest rates in some advanced economies;
- reduced risk appetite towards emerging economies.

iii. Inflation:

- significant and temporary upward effects from the halt in the transportation sector and from other relative price changes;
- measures of underlying inflation still running at low levels, including those components which are more sensitive to the economic cycle and to the monetary policy;
- Focus expectations for 2018, 2019 and 2020 around 3.9%, 4.1% and 4.0%, respectively.

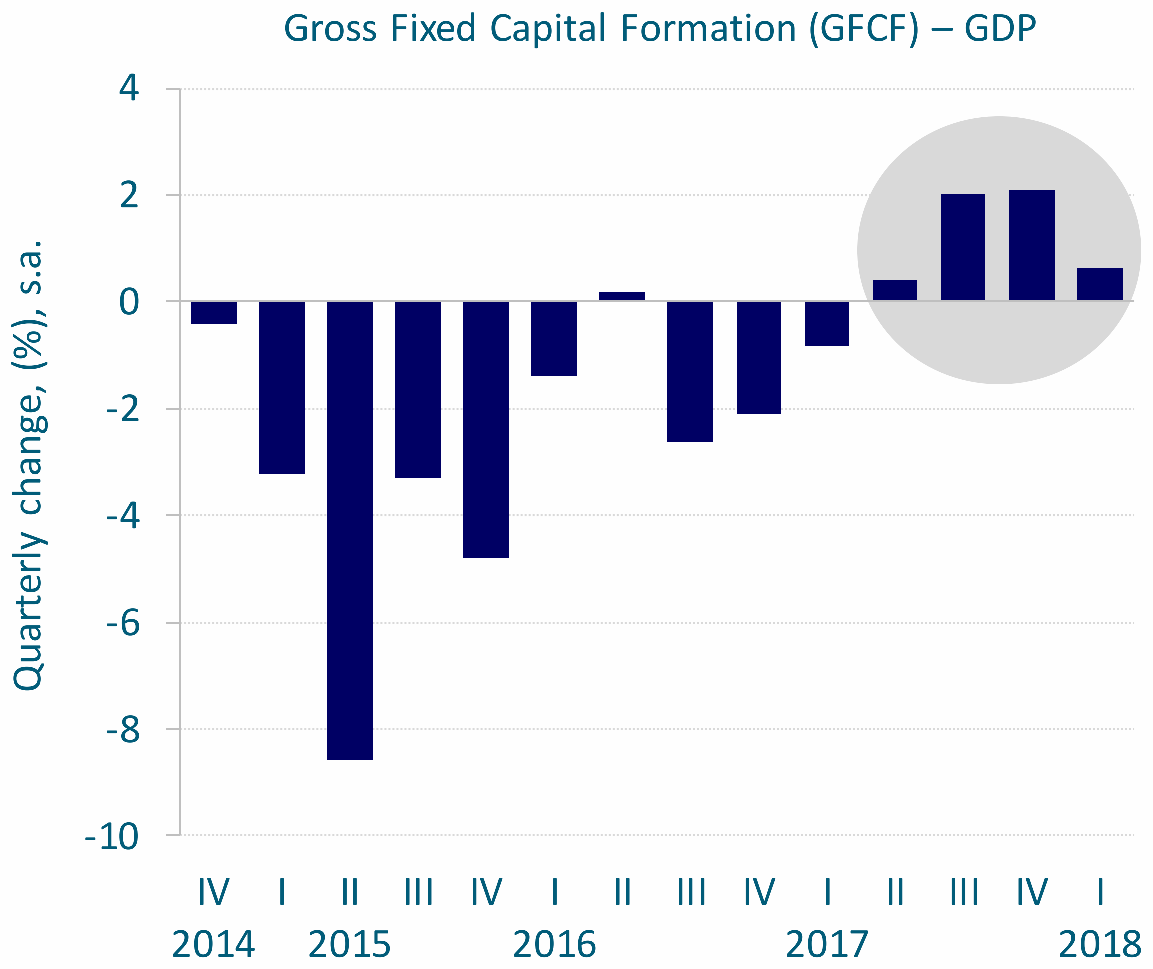
i. Economic Activity

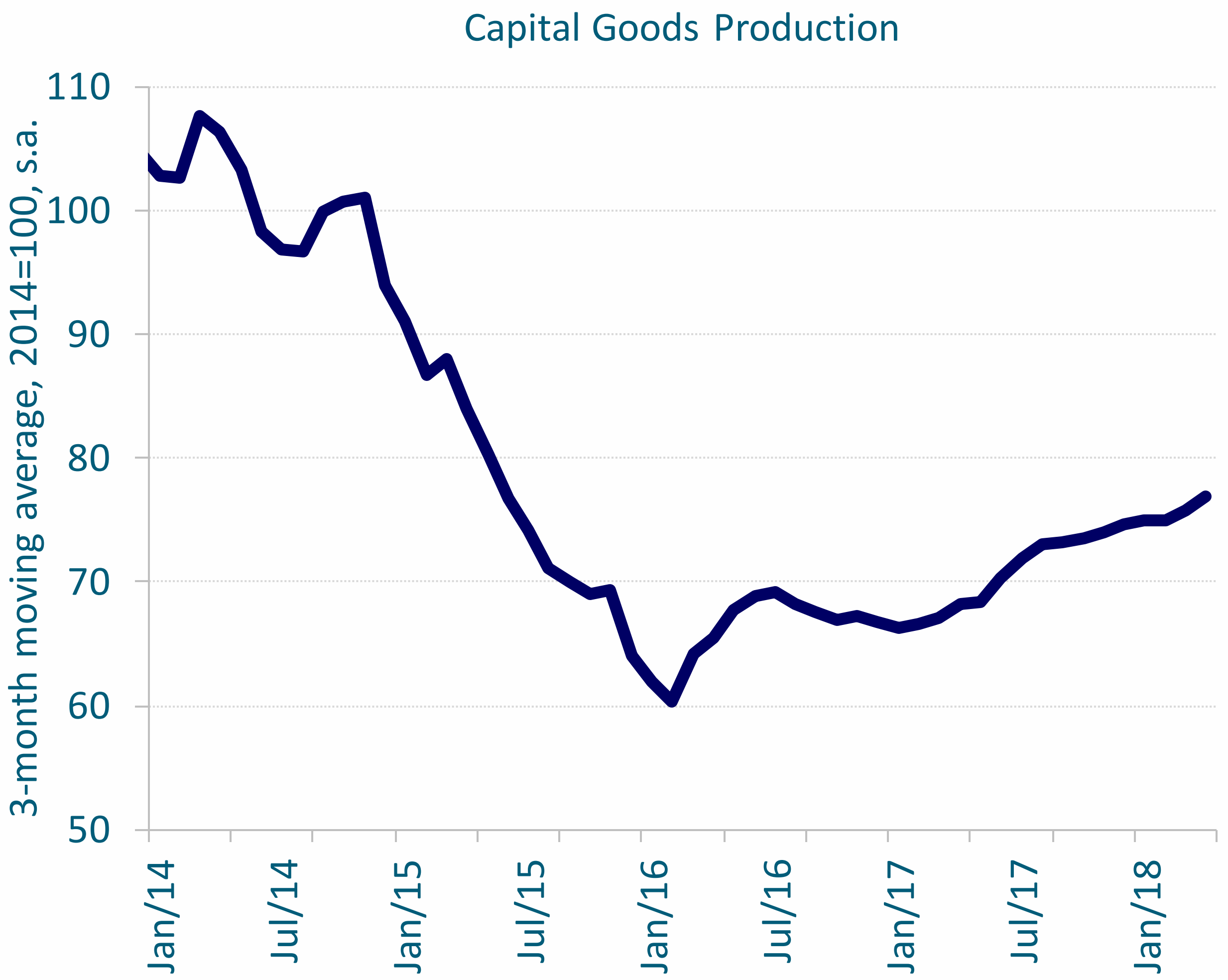
Economic Activity Index – IBC-Br



Source: BCB

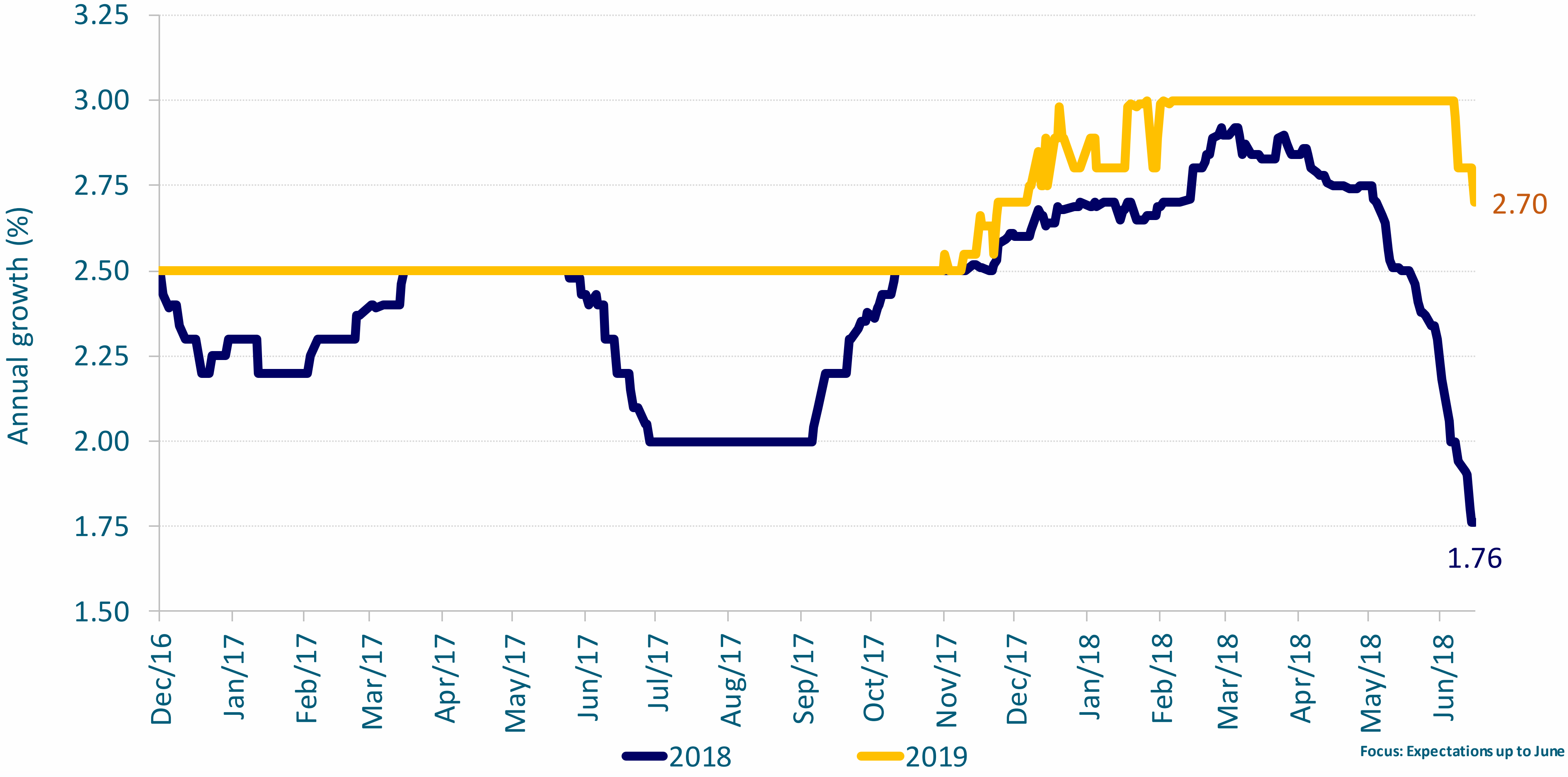
Investment Recovery





Source: IBGE

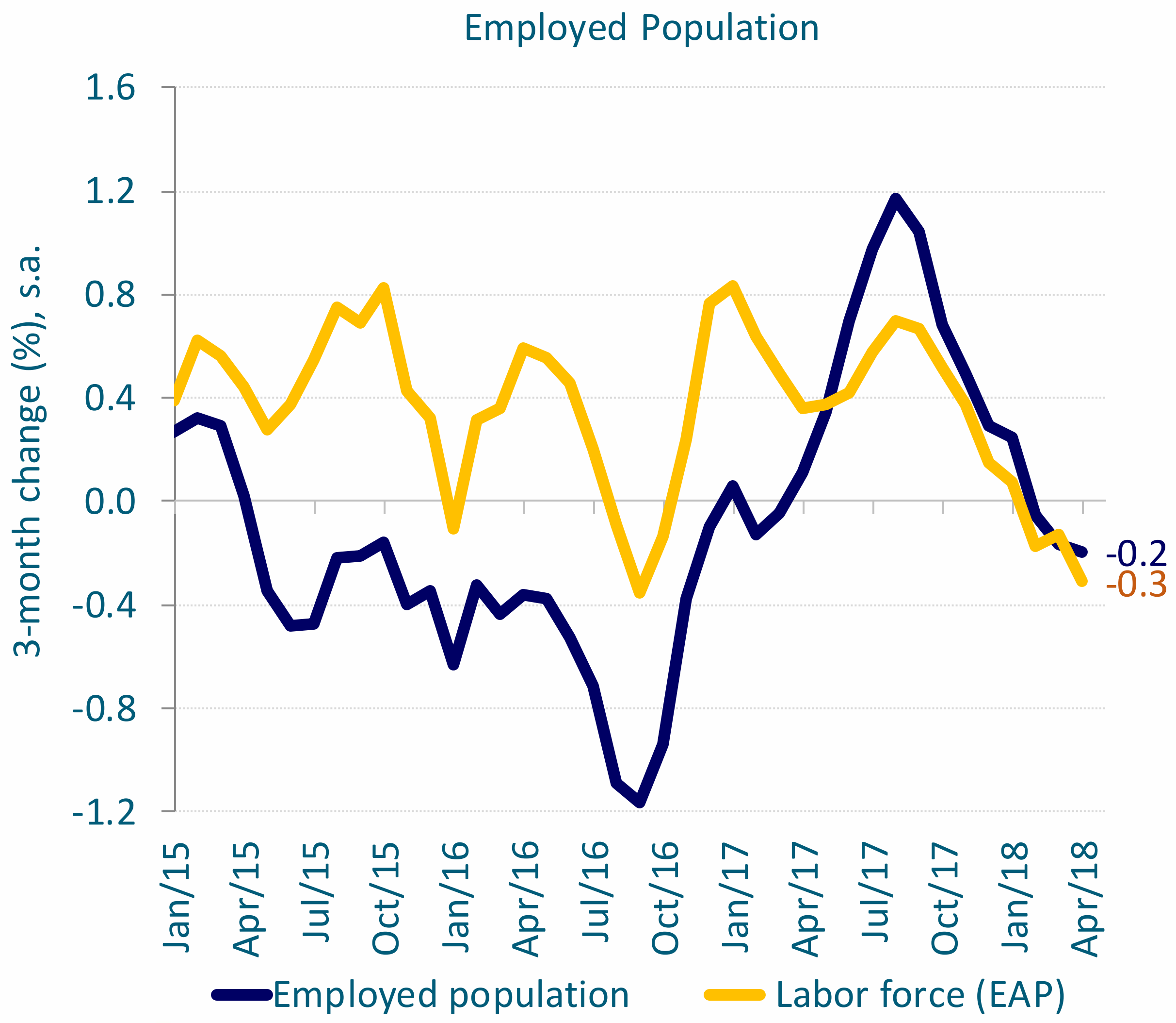
GDP Market Expectations

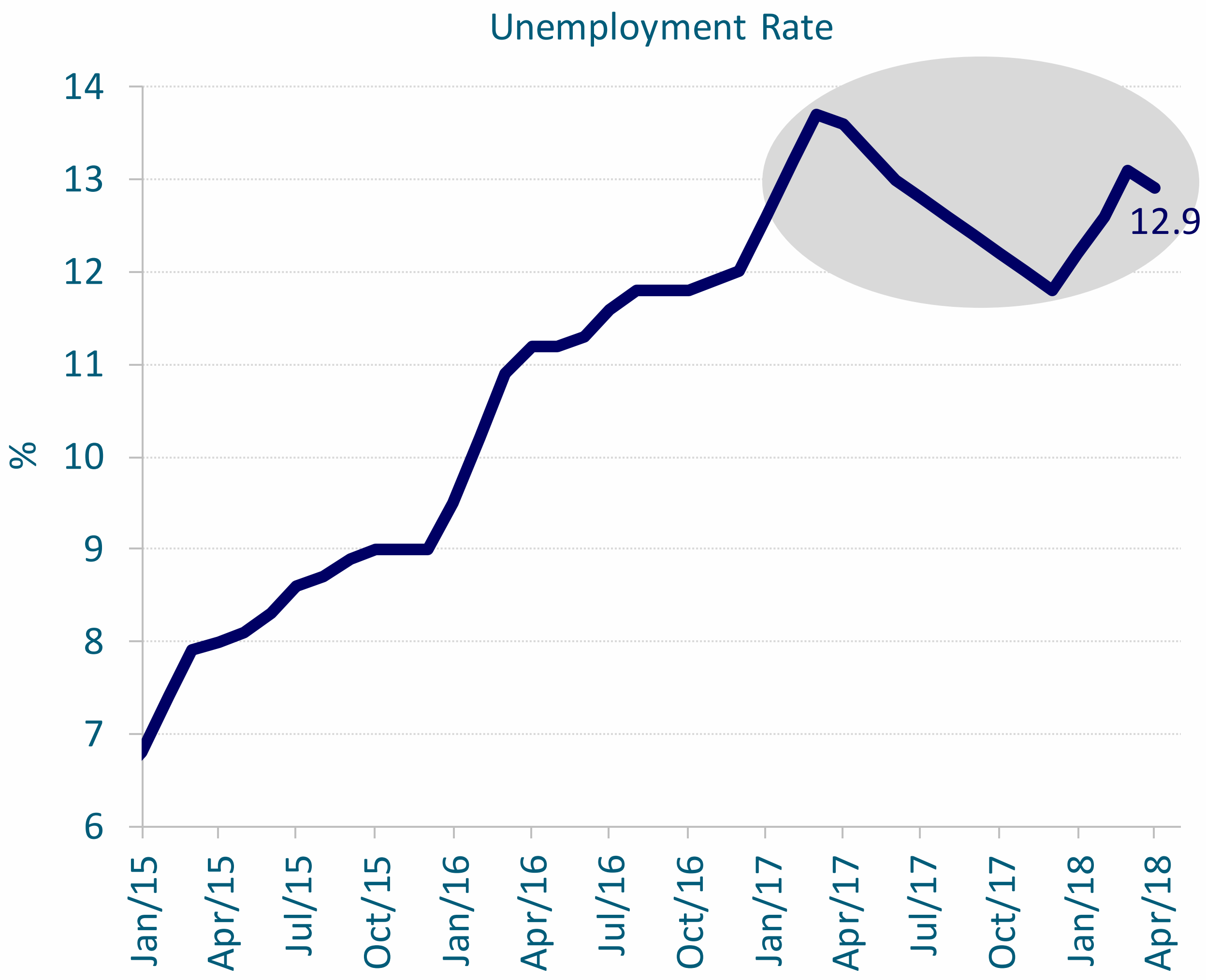


Focus: Expectations up to June 15th

Source: BCB (Focus)

Labor Market

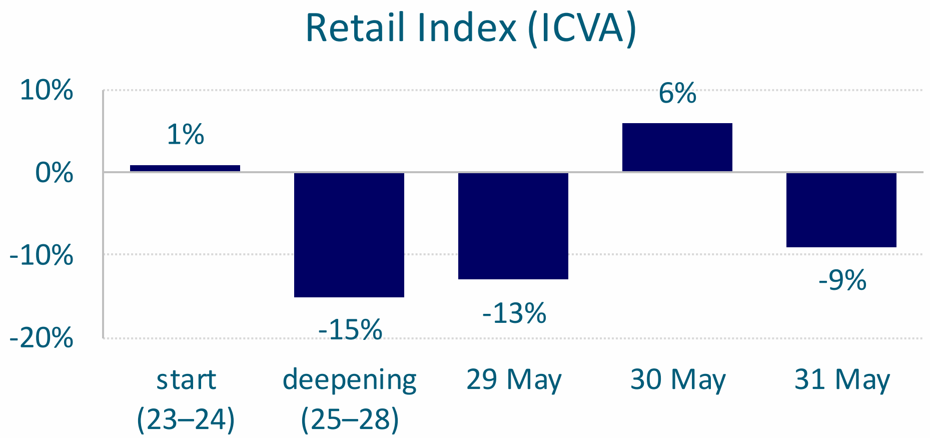


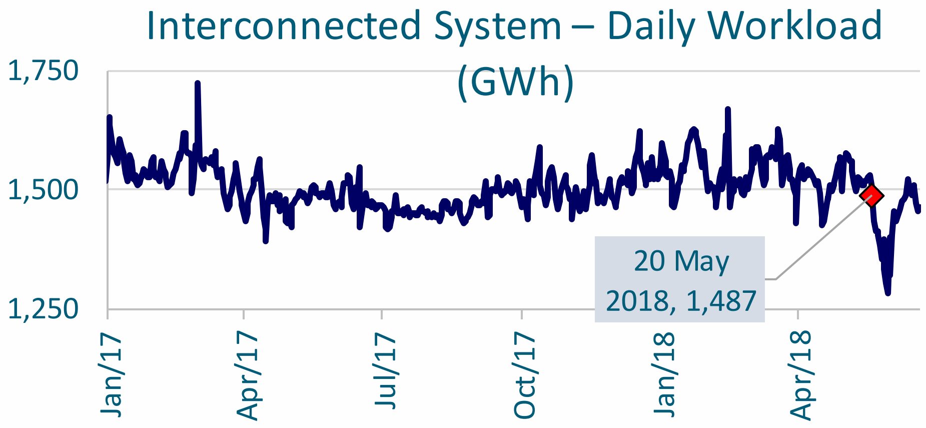


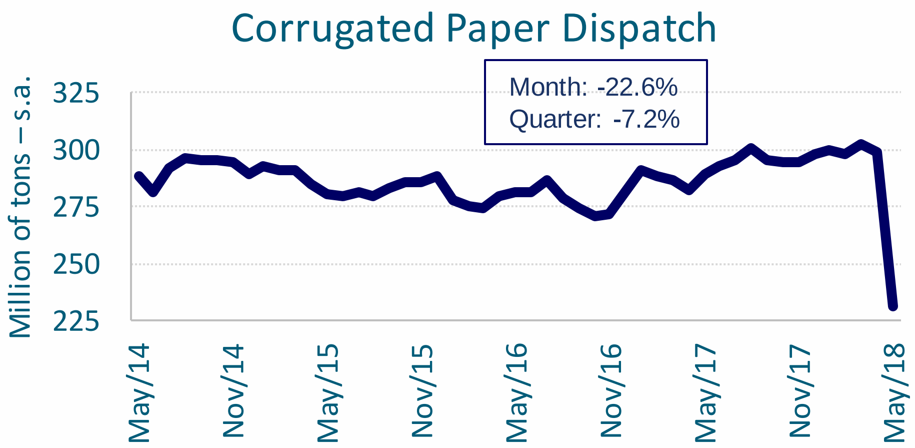
Source: IBGE (PNAD Contínua)

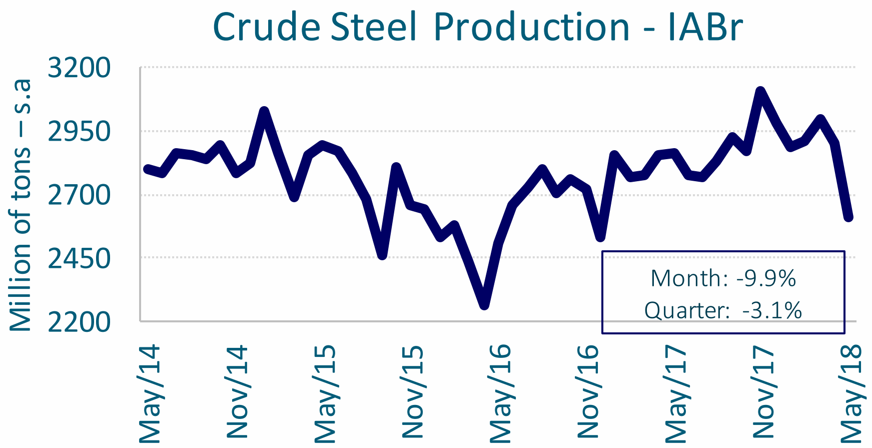
Halt in Transportation Sector – Effects on Activity

Significant Direct Effects in May and June with Different Intensities among Several Segments









Index May/21 = 100 Peak Average Halt (May/22)

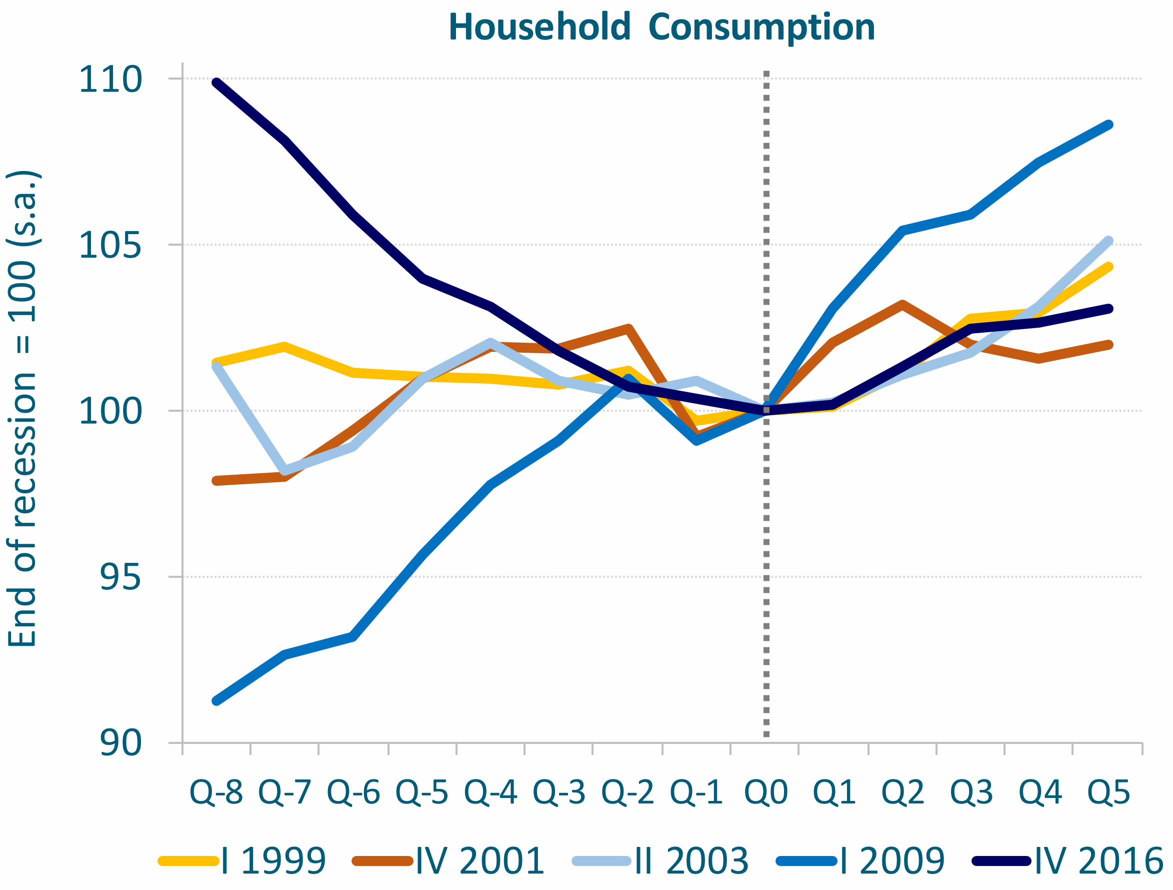
Sources: Cielo/IVCA, ONS (s.a. by BCB), ABPO and IABr

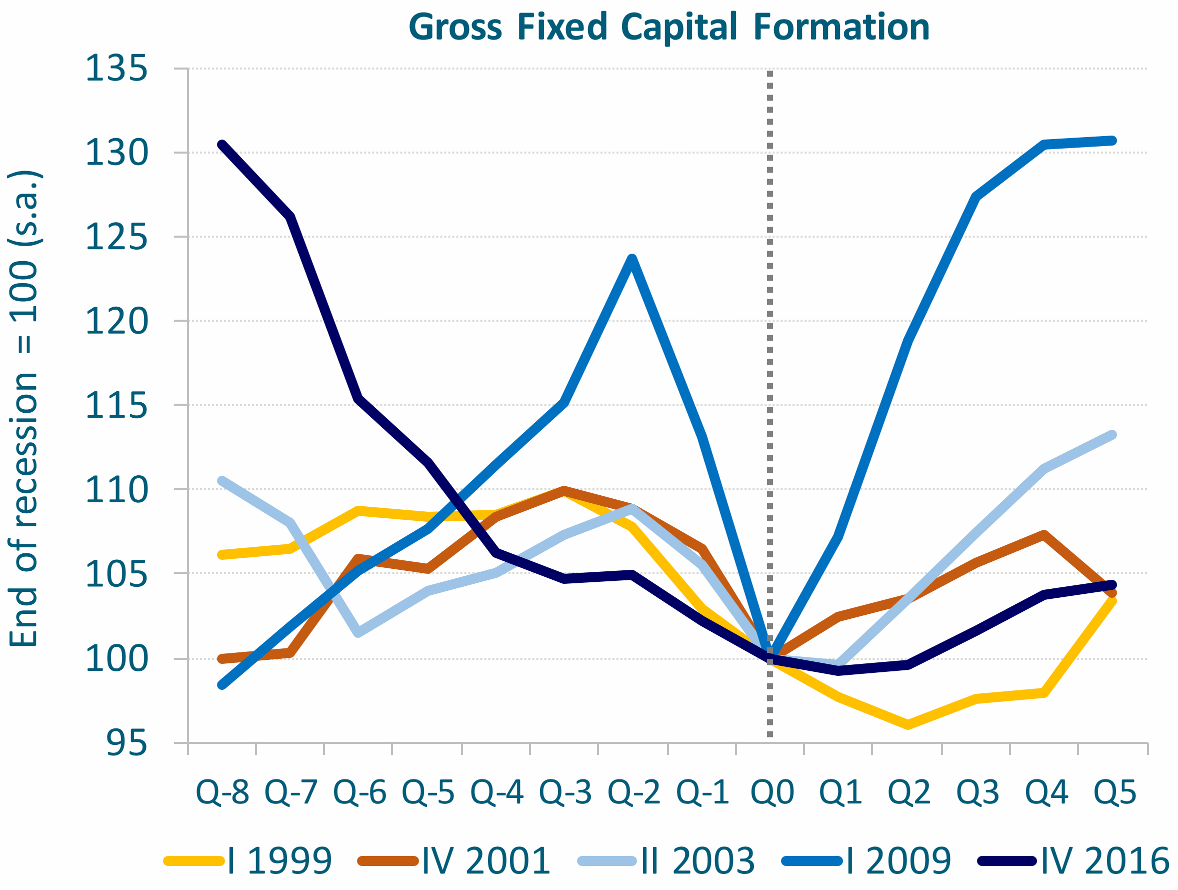
Box – Projections for 2018 GDP

- Growth of 1.6% in 2018 (1.0% in 2017)
  - Supply:
    - Agriculture & Livestock: 1.9% in 2018 (13.0% in 2017);
    - Industry: 1.6 in 2018 (0.0% in 2017);
    - Services: 1.3% in 2018 (0.3% in 2017).
  - Demand:
    - Investment: 4.0% in 2018 (-1.8% in 2017);
    - Household Consumption: 2.1% in 2018 (1.0% in 2017);
    - Government Consumption: -0.2% in 2018 (-0.6% in 2017);
    - Net Exports: -0.1 p.p. in 2018 (0.0 p.p. in 2017).

Box – Private Components in Cycles of Economic Recovery

Pace of recovery of private components of aggregate demand in cycles of economic activity recovery.

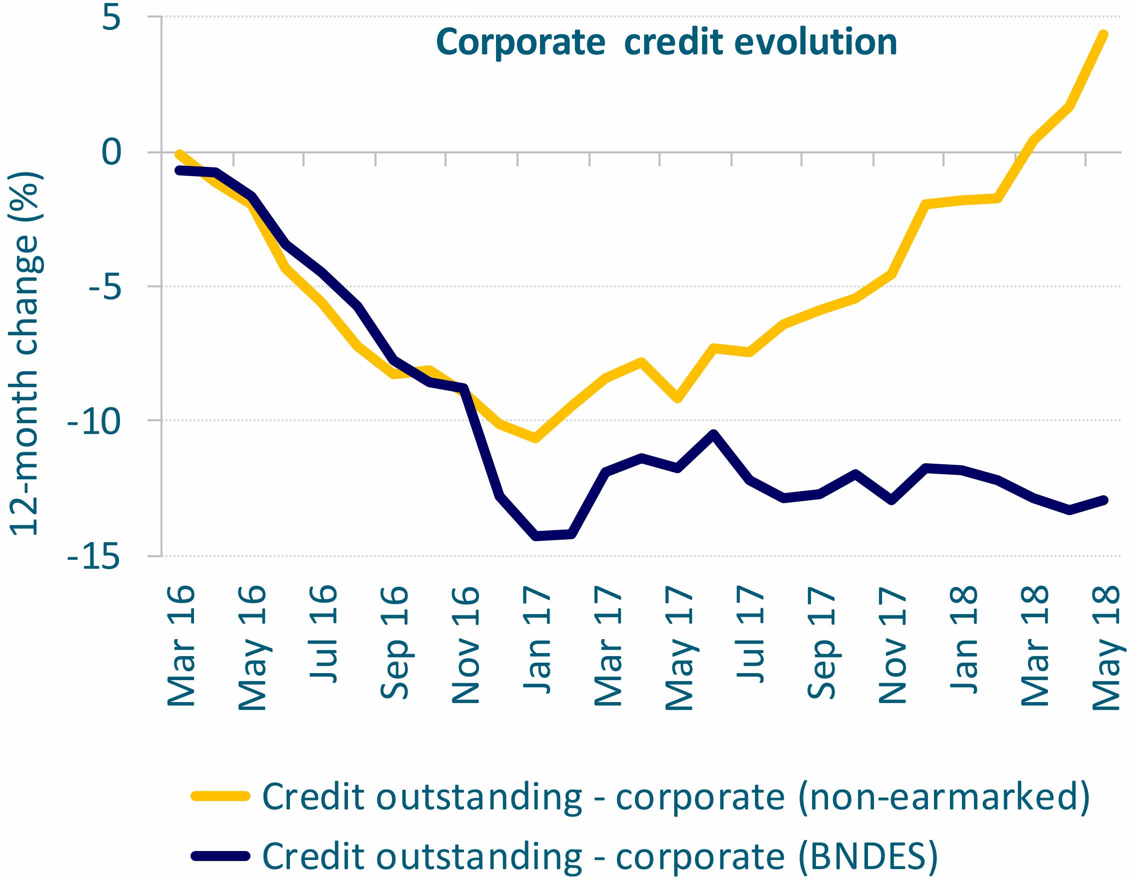


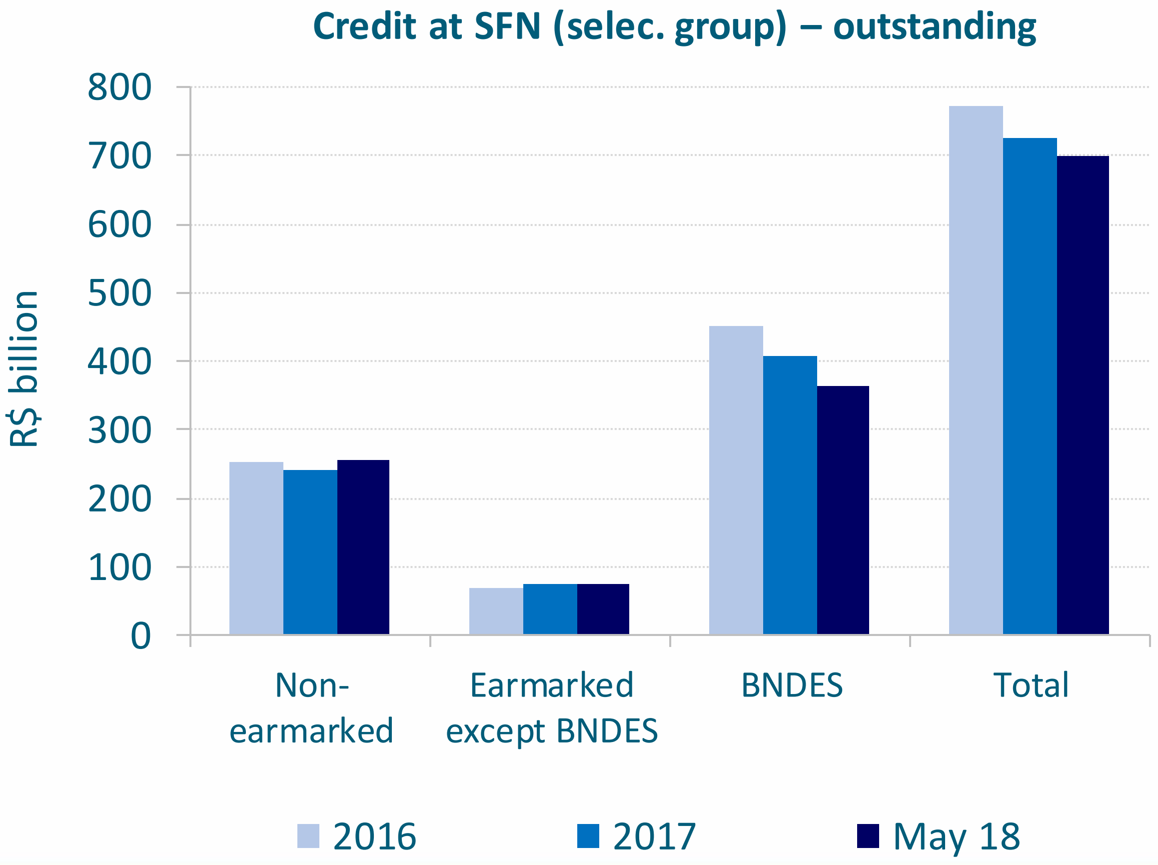


Source: IBGE

Box – Broad Corporate Financing

- Corporate credit portfolio with non-earmarked and BNDES resources present different behavior as at 2017;
- Selected group of 1400 corporations (80% of BNDES portfolio) recorded significant decrease of debt with BNDES (-R$86.3 billion; -19.1%) and growth of non-earmarked operations (+R$4,5 billion; +1.8%) and other earmarked resources (+R$6.9 billion; +10.1%).

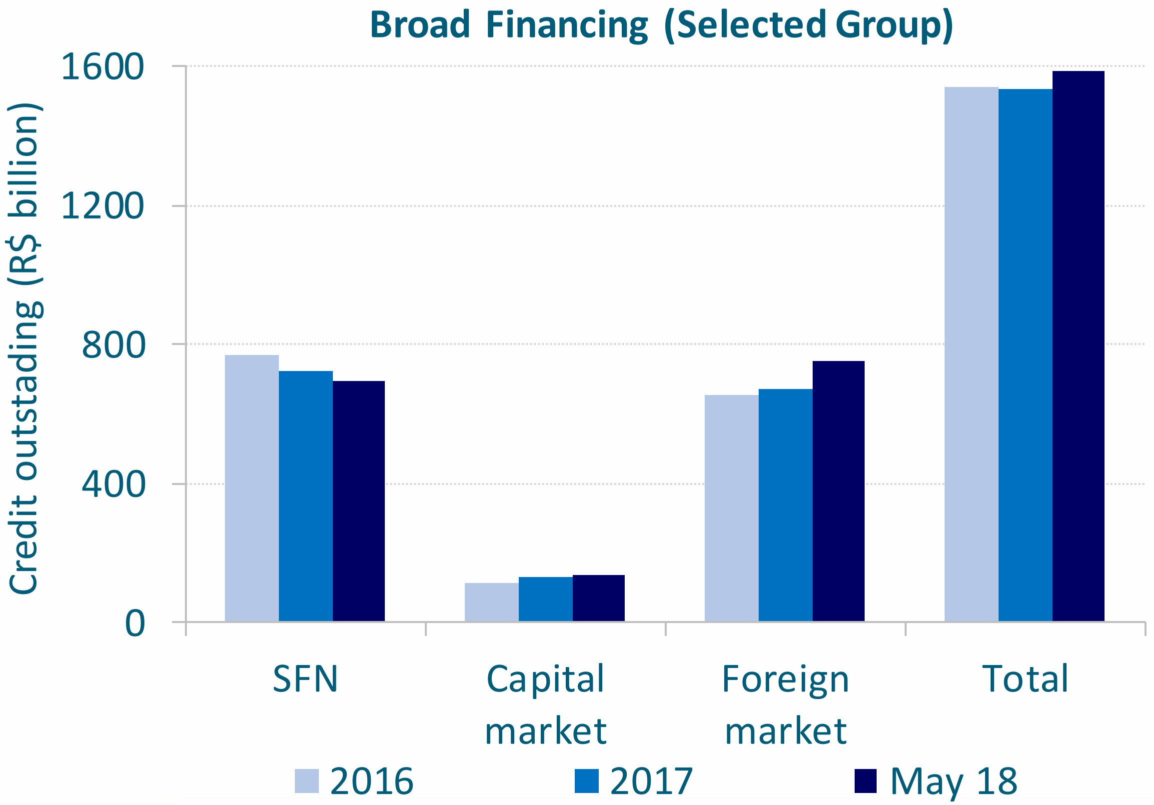


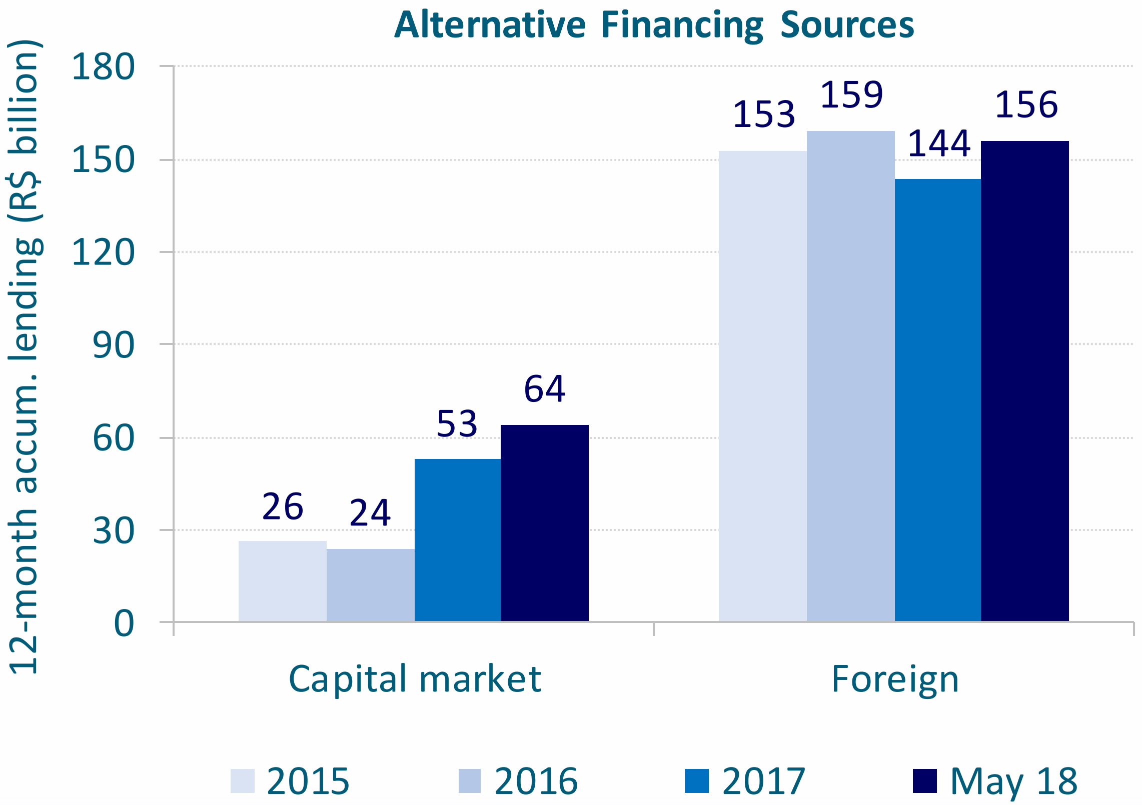


Sources: BCB and Cetip

Box – Broad Corporate Financing

- Evidence suggest that the reduction of the debts of the selected group with the BNDES is associated with the convergence of financing costs in the capital and external markets, with growth of approximately 7% in these markets in 2017, a trend that remains in 2018;
- Despite the reduction of corporate credit in the SFN, the broad financing of the group of companies with greater financial capacity has indicated a more benign framework in line with a gradual improvement of investments (GFCF).



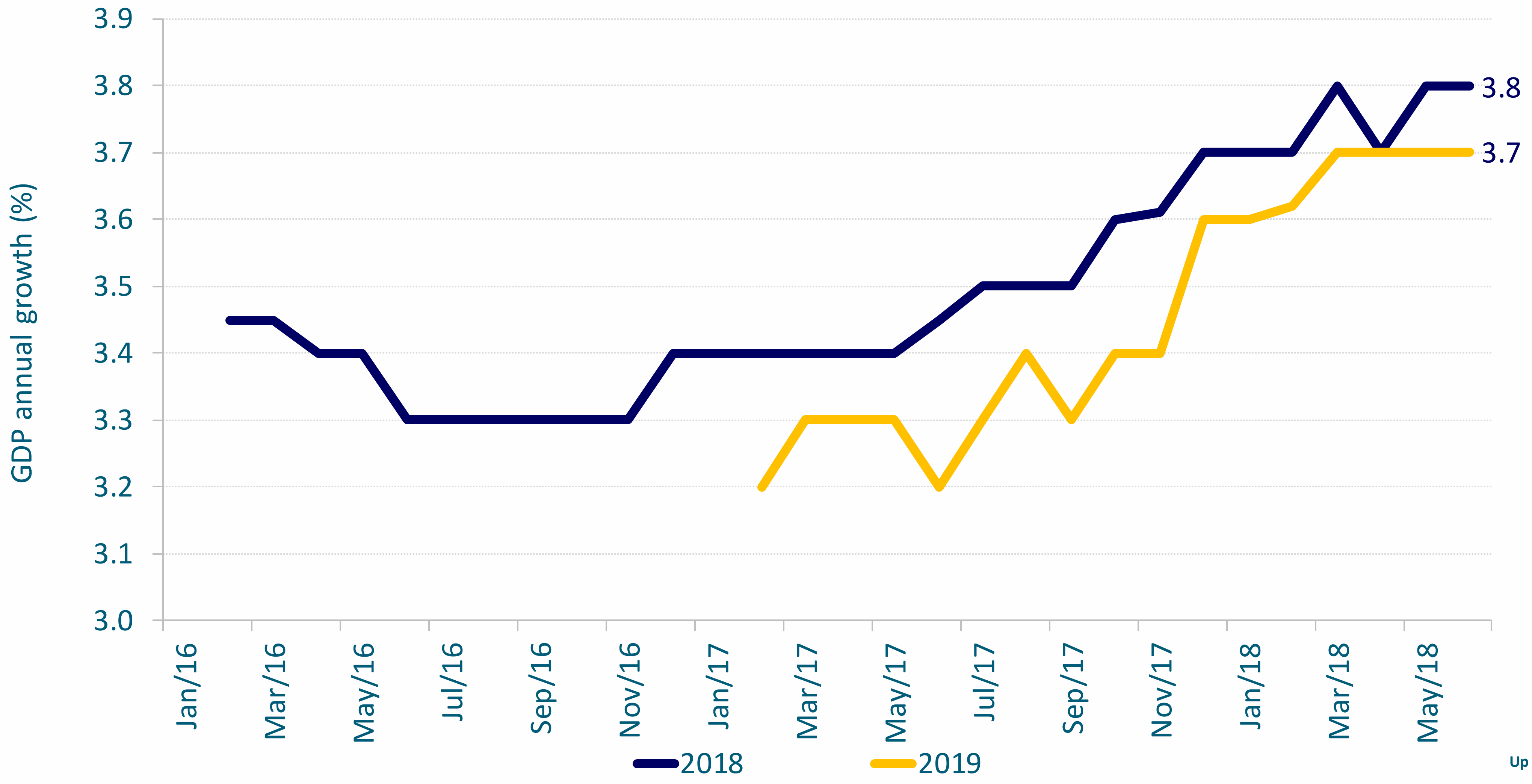


Sources: BCB and Cetip

BANCO CENTRAL DO BRASIL

ii. Global Outlook

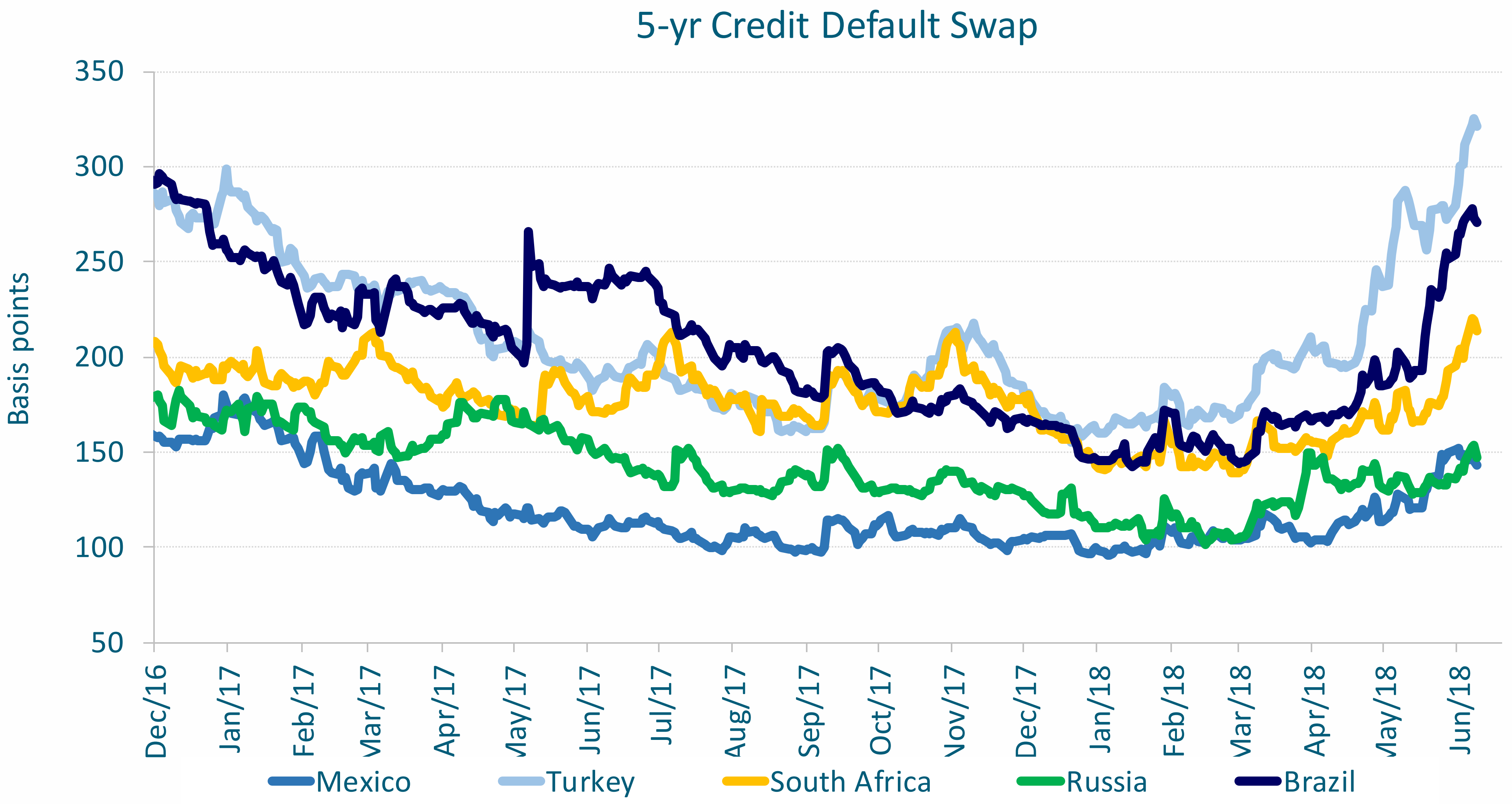
Expectations of Widespread Global Growth



Up to June 25th

Source: Bloomberg

Sovereign CDS



Up to June 20th

Source: Bloomberg

Box – 2018 Balance of Payment projection

US$ billion

Period	2017	2018 March IR[1/]	2018 June IR[1/]
Current account	**-9.8**	**-23.3**	**-11.5**
Trade balance	**64.0**	**56.0**	**61.0**
Exports	217.2	225.0	228.0
Imports	153.2	163.0	167.0
Services	-33.9	-38.1	-35.6
Primary income	-42.6	-43.6	-39.4
Financial account	**-6.1**	**-22.9**	**-11.1**
Investim. assets[2/]	63.5	68.1	63.0
Investim. liabilities	75.4	103.4	87.6
DIL	**70.7**	**80.0**	**70.0**
Total shares[3/]	5.7	4.2	3.0
Debt sec. in Brazil	-5.1	6.4	0.0
Loans and debt sec. LP[4/]	-5.2	-2.6	-5.5
Memo:			
Current account/GDP (%)	**-0.5**	**1.10**	**-0.6**
DIL / GDP (%)	**3.4**	**3.8**	**3.6**
Rollover rate (%)	98.3	100.0	90.0

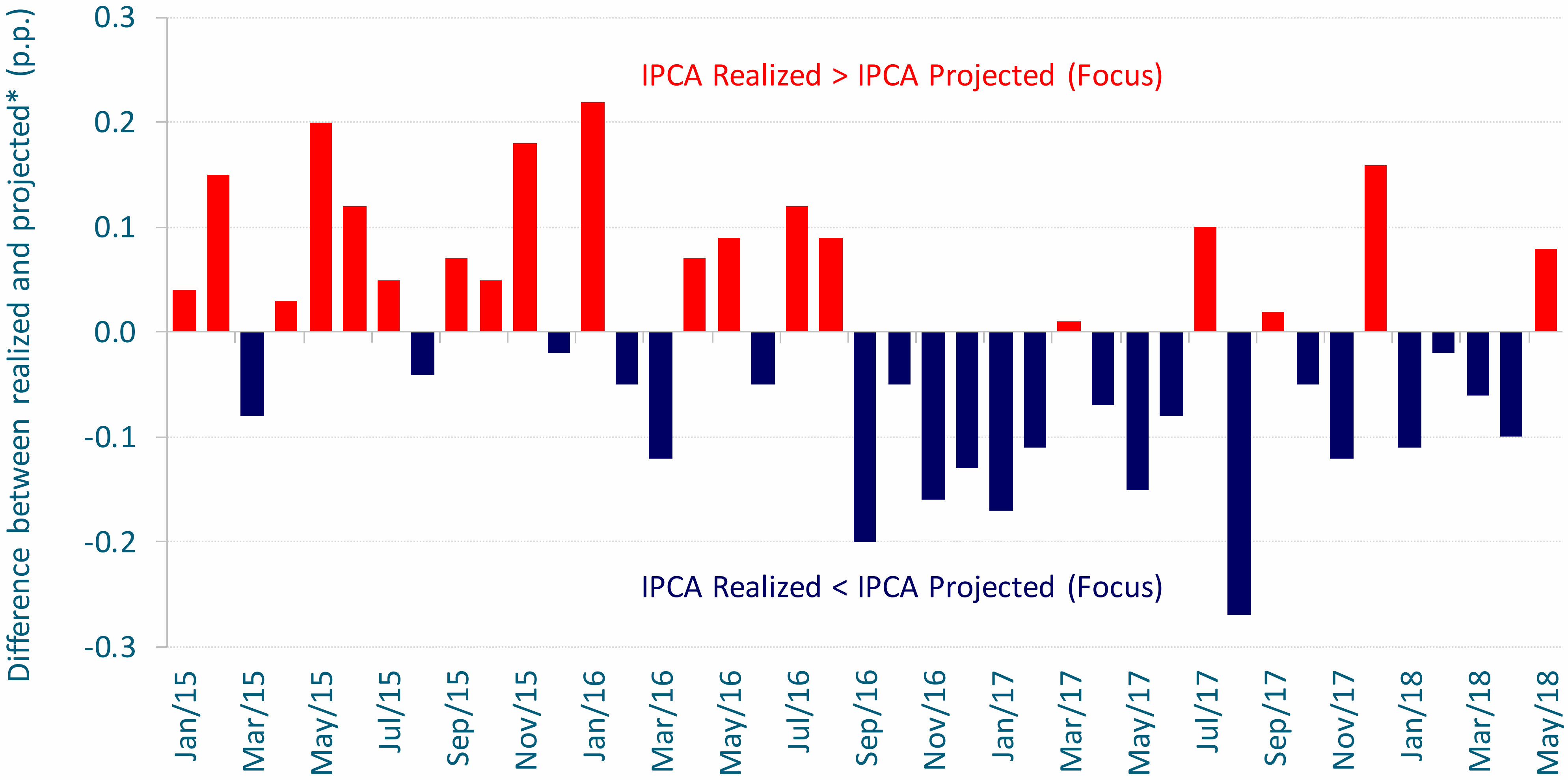
1/ Projection.

- Reduction of annual forecast for current account deficit, reflecting recent exchange and activity dynamics;

- Net inflows from DI liabilities of US$ 70 billion (3.6% of GDP), comfortably providing the financing of current account.

iii. Inflation

Monthly IPCA – Realized x Projected (Focus)

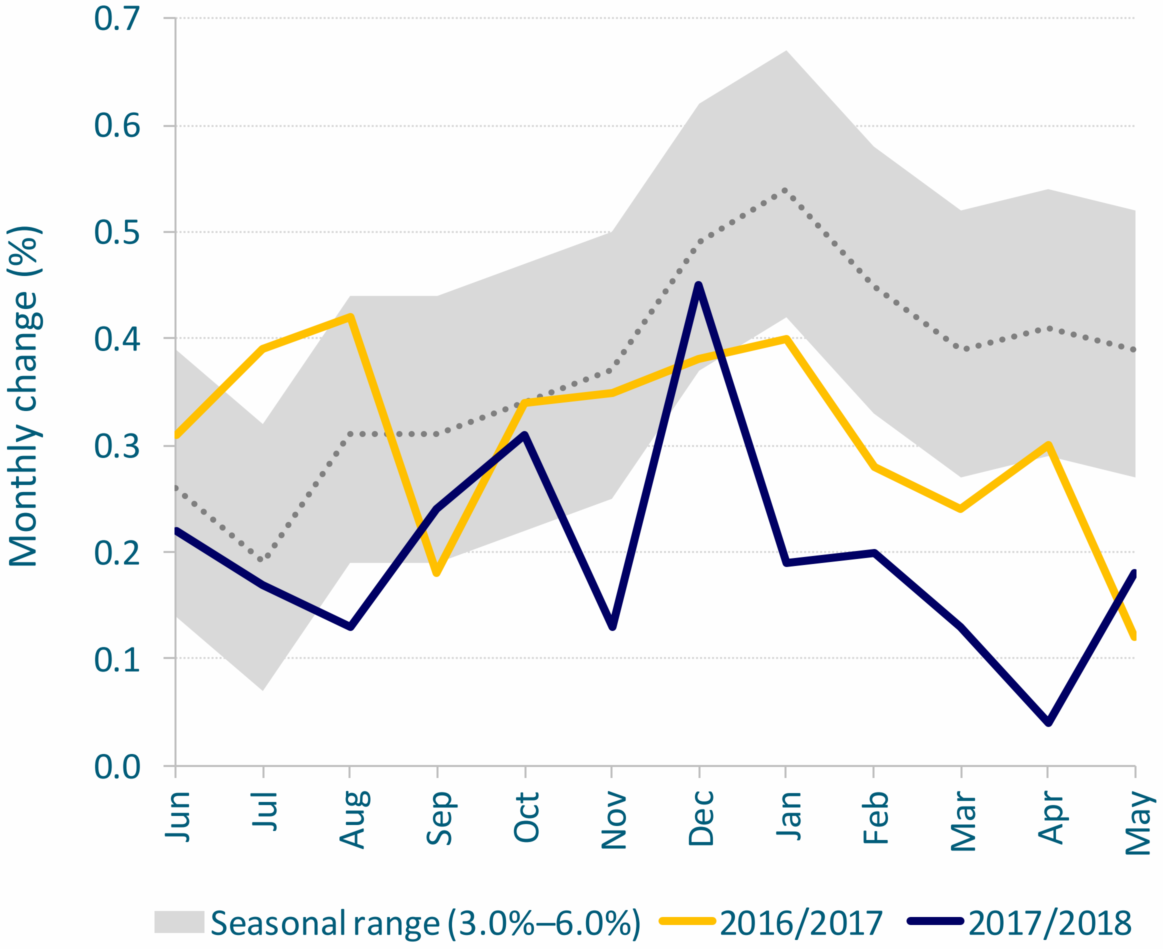


*projected at reference dates of the 'Top 5 for IPCA'

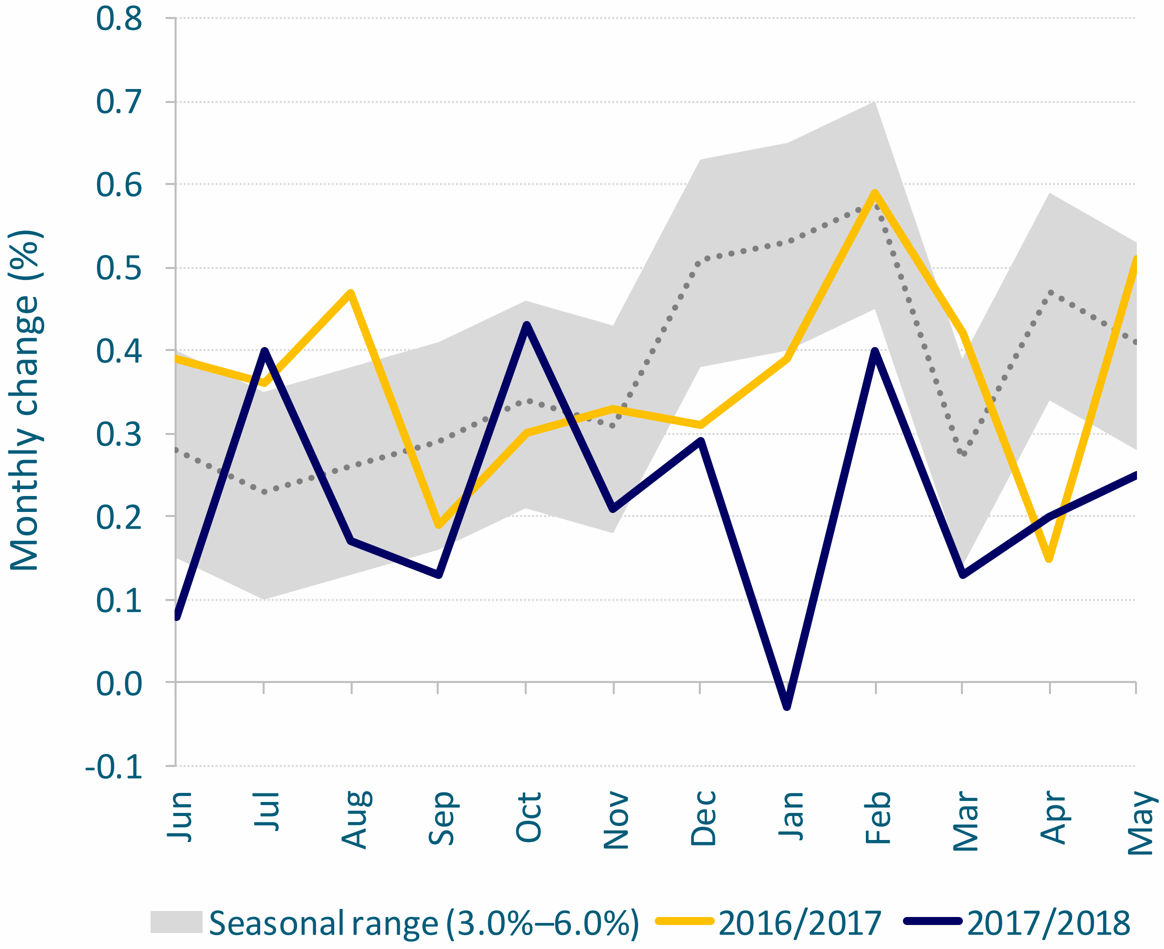
Sources: IBGE and BCB (Focus)

Measures of Underlying Inflation

Trimmed Mean Core



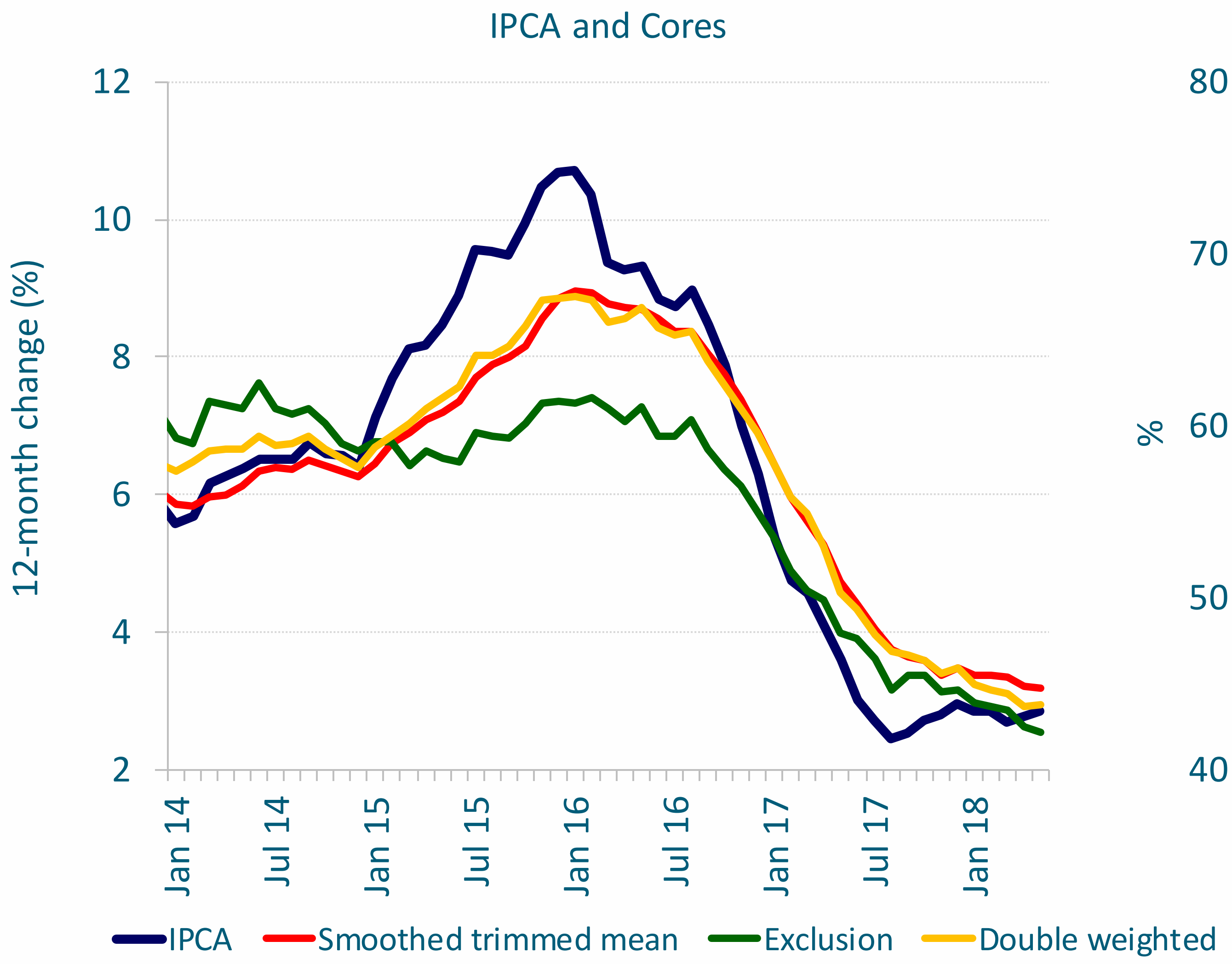
EX1 Core

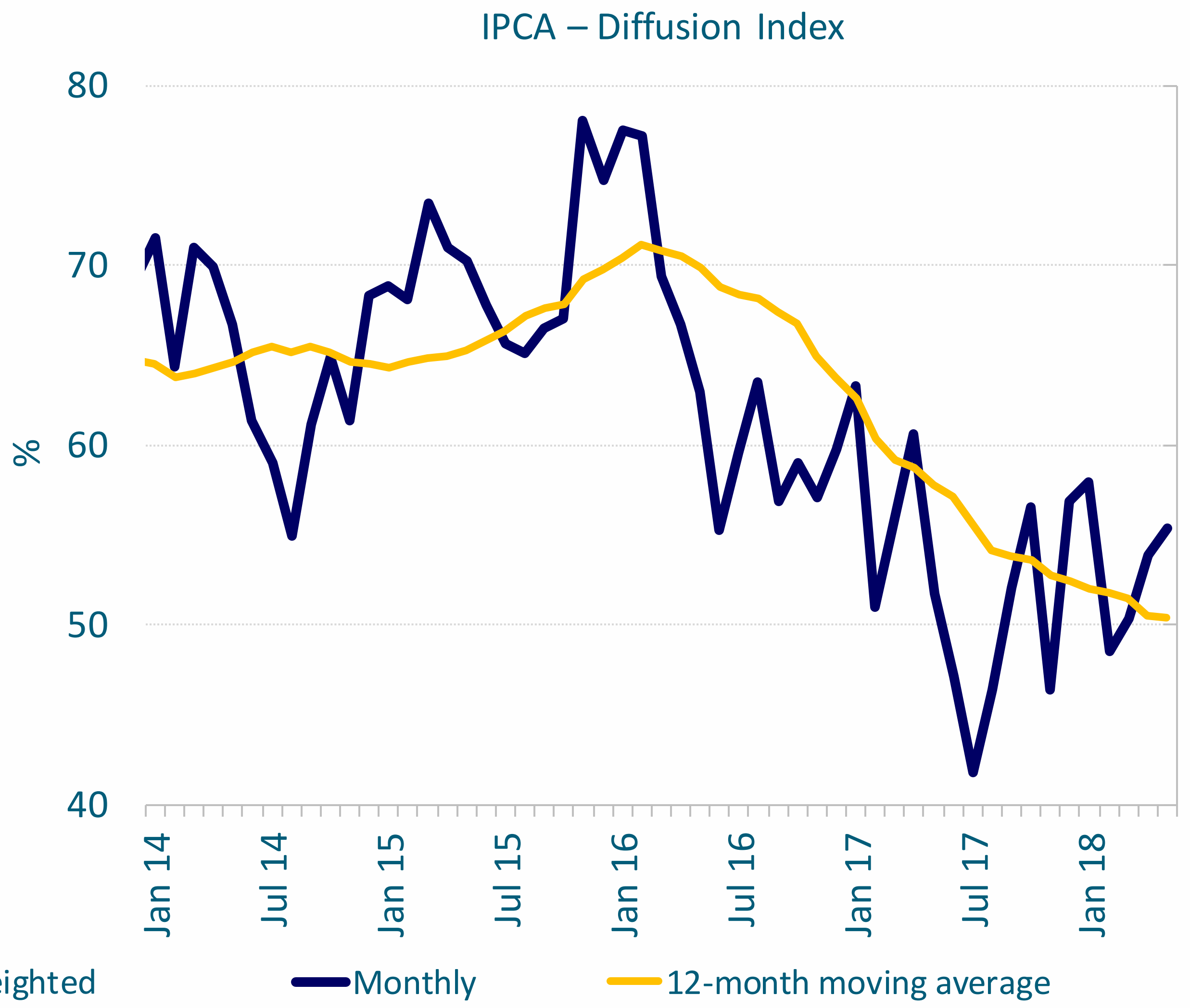


Seasonal range: seasonal pattern compatible with inflation target range

Sources: IBGE and BCB

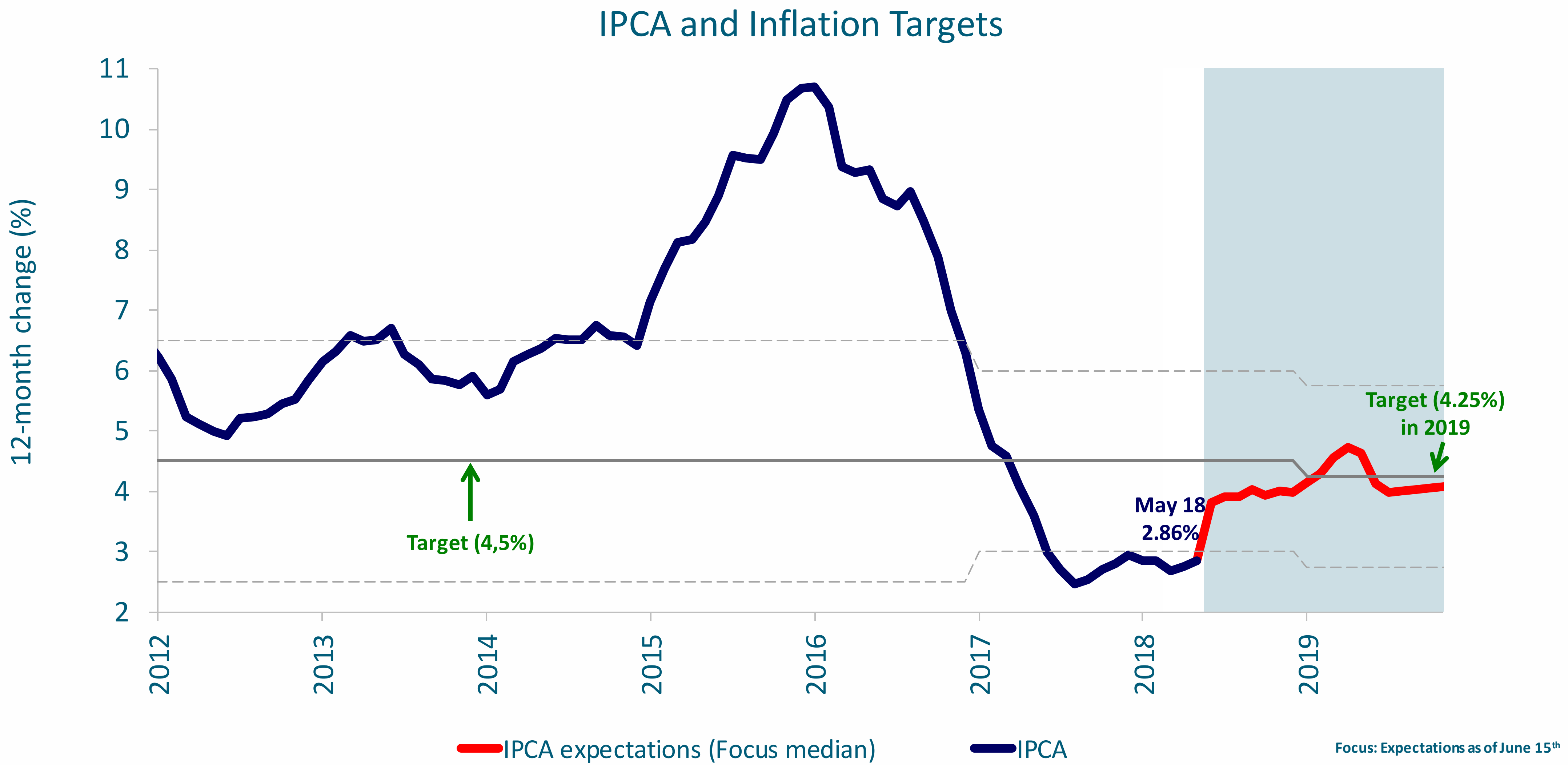
CPI (*IPCA*), Core and Diffusion Index





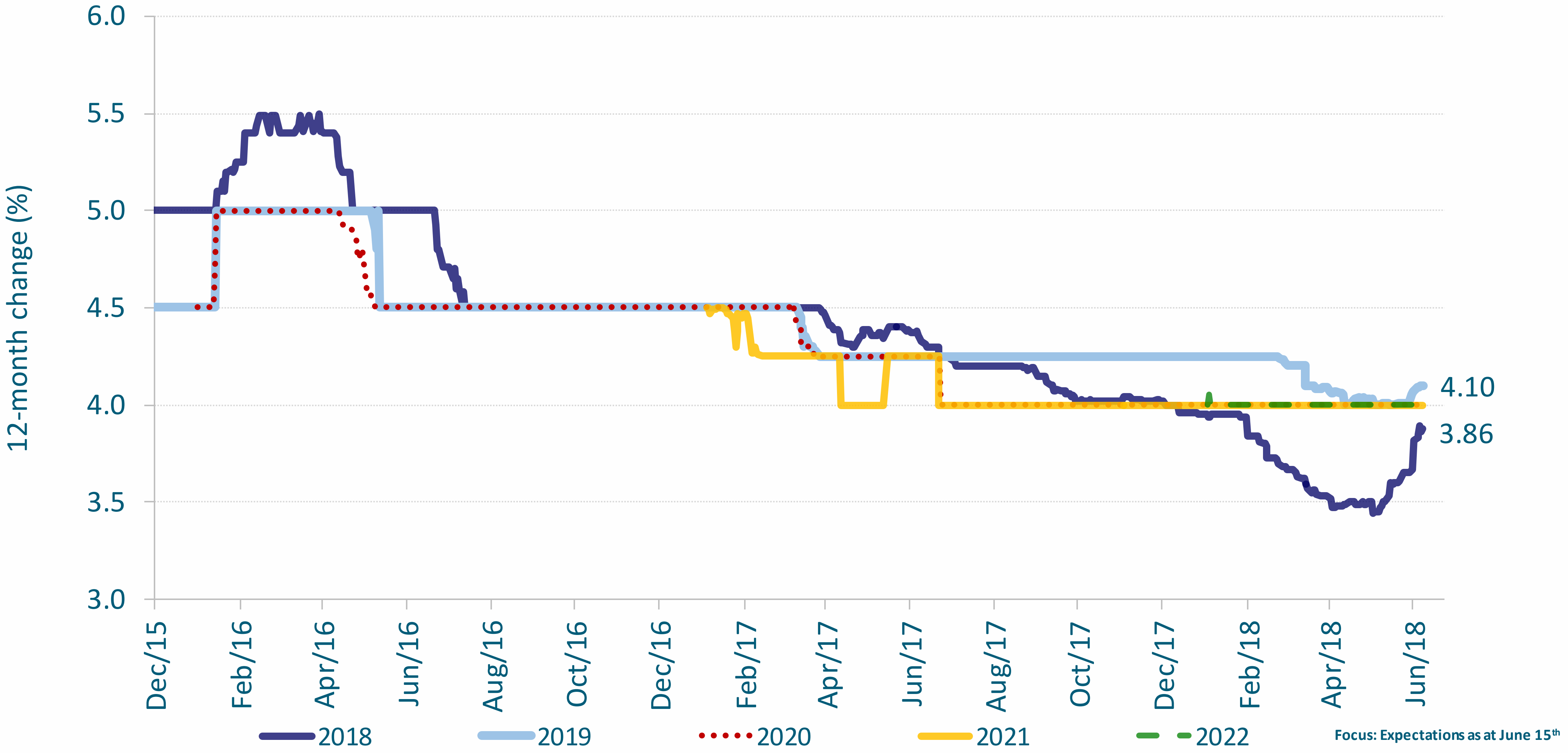
Source: IBGE

CPI (*IPCA*)



Source: IBGE and BCB (Focus)

Evolution of Market Expectations for 2018-2022 IPCA

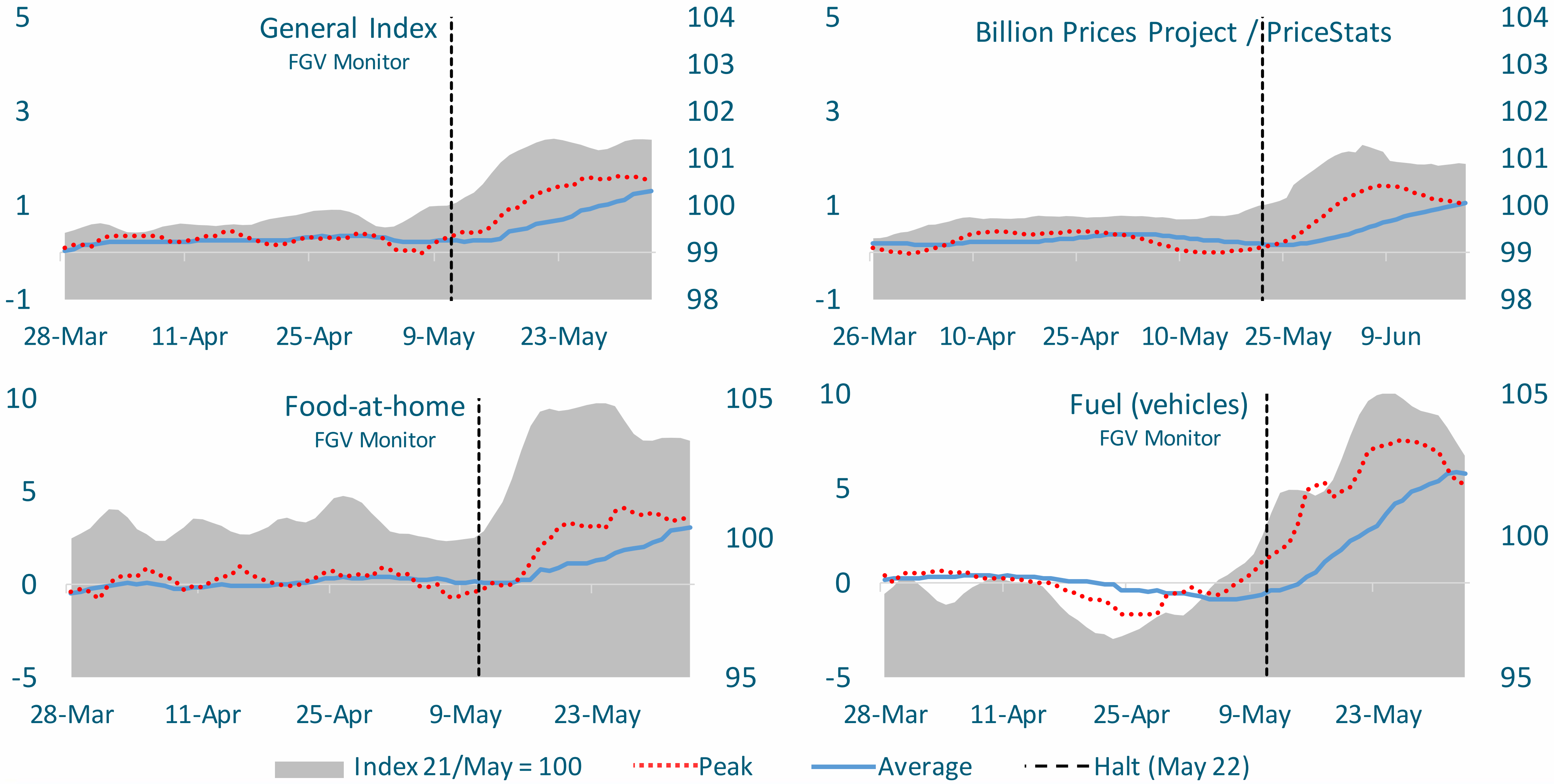


Focus: Expectations as at June 15th

Source: BCB (Focus)

Halt in Transportation Sector – Effects on Inflation

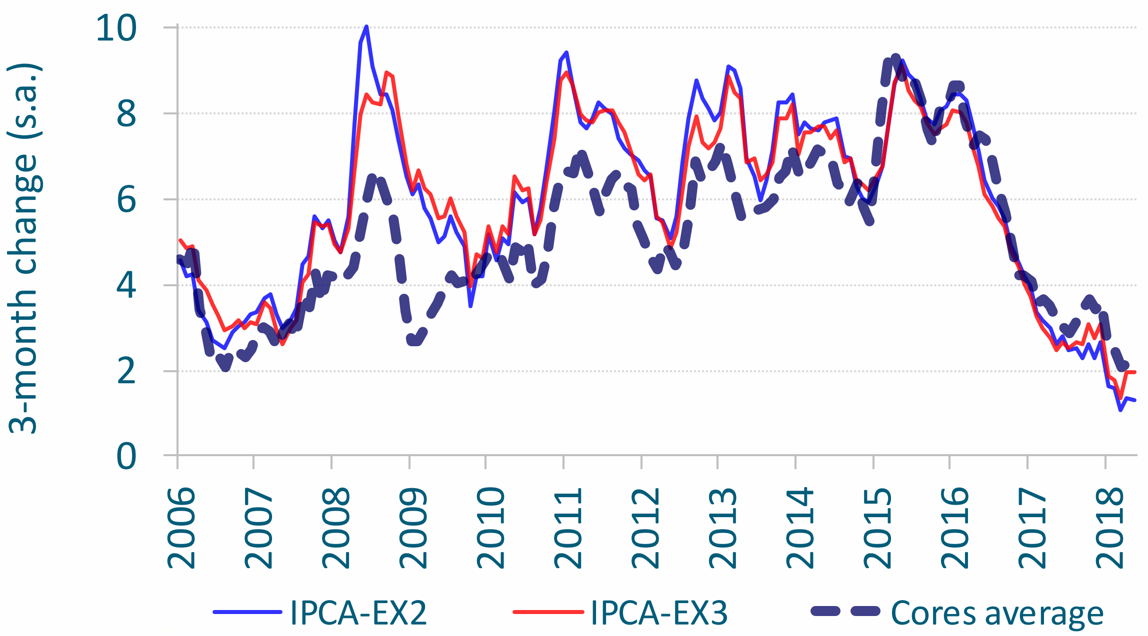
Significant but Temporary Direct Effects

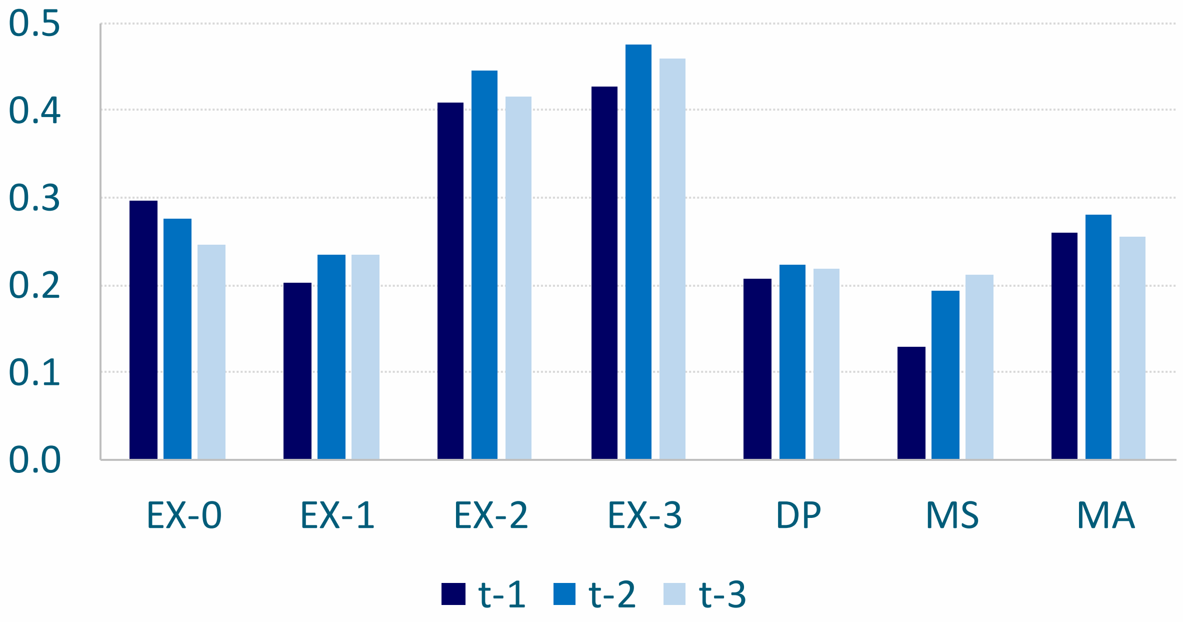


Sources: FGV and Billion Prices Project/PriceStats (BCB projections)

Box - New Core Inflation Measures

- IPCA-EX2 and IPCA-EX3 expand the concept of underlying indicator of inflation services by including food and industrial goods prices;
- New cores correlate to output gap measures, denoting the sensibility to the economic cycle;
- Several core measures presented in the box indicated additional fall of underlying inflation at the beginning or 2018, registering low levels up to May;
- No specific core measure should be particularly highligted.

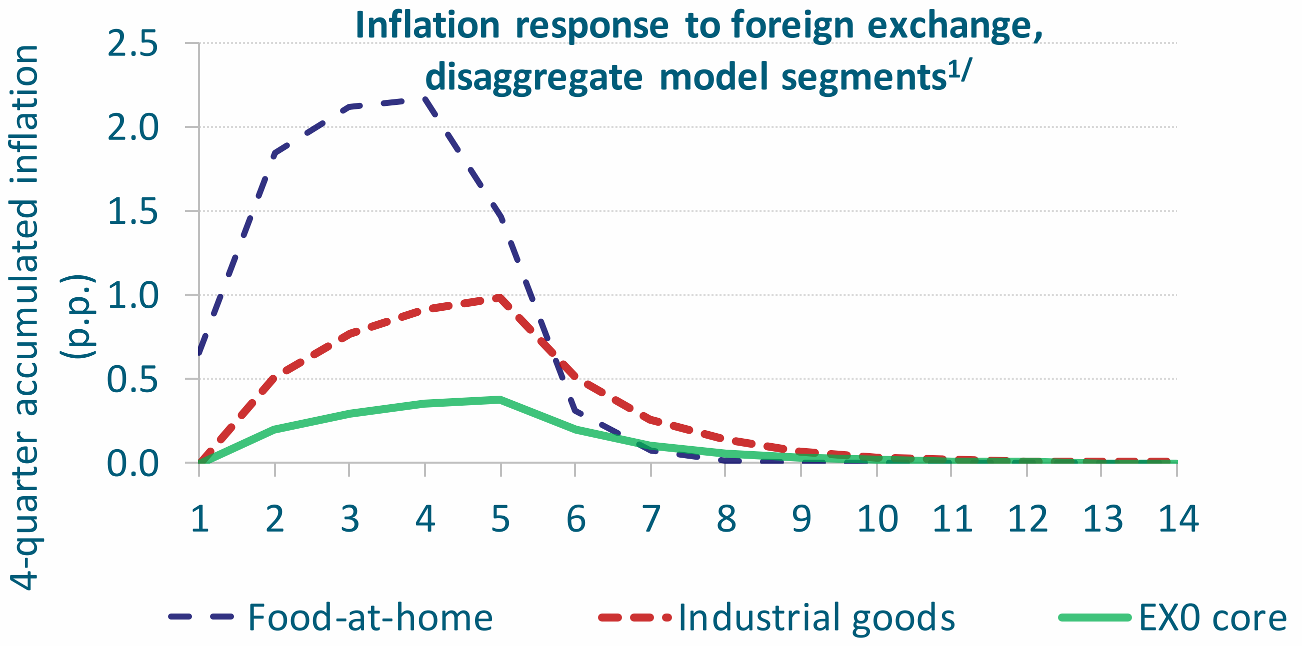




Source: BCB and Cetip

Box - Small-scale Model of Disaggregated Prices – 2018

- Disaggregated model: non-earmarked price inflation is modelled with disaggregation by sectors: services, industrial goods, and food-at-home. Remaining parts of the model: similar to the aggregated model;
- allows more directly mapping shocks from each sector and the pass-through of exchange rate variations in each sector;
- stronger exchange-rate pass-through occurs at food-at-home;
- EX0 core inflation (services and industrial goods) has the weakest exchange rate pass-through.

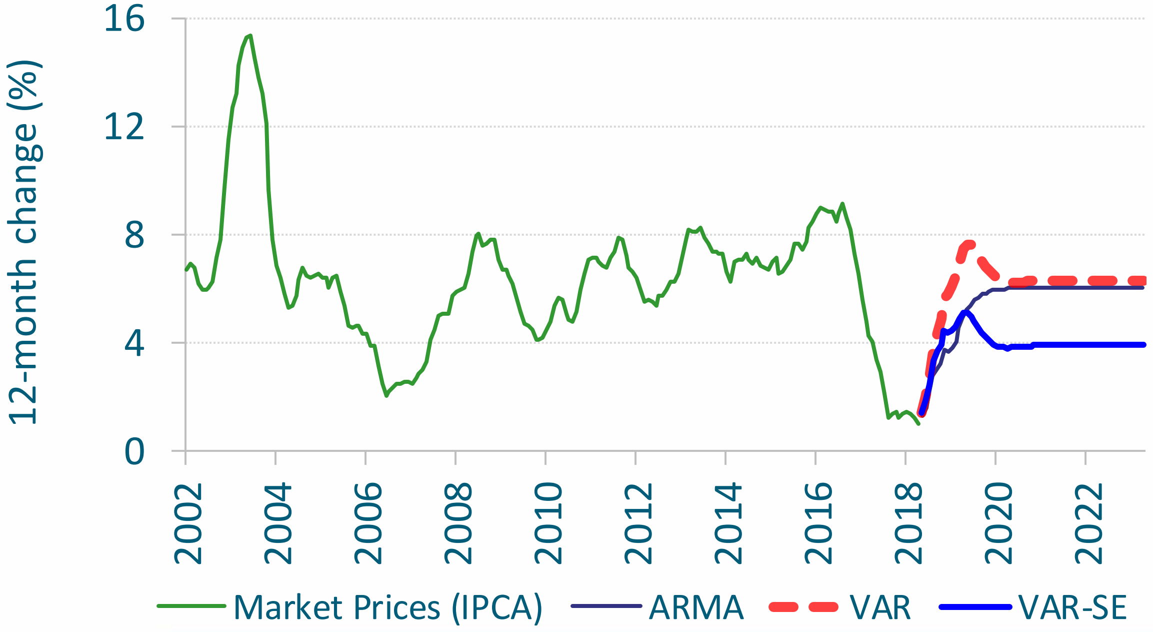


1/ Depreciation of 10% exchange rate in *t*=1

Box – Vector Autoregression Model with Long-term Anchoring

- In the standard VAR model the long-term projection converge to the unconditional mean of its variables;
- new VAR-SE model (shifting endpoint) allows anchoring the long-term projection in the Focus survey projections;
- Thus, projections incorporate important recent changes in the Brazilian economy, such as the anchoring of expectations and the setting of targets for inflation ahead at lower values than those in force in recent years;
- VAR-SE model predictive ability is superior in some horizons compared to ARMA and VAR models.

Market Prices (IPCA) and projections



Source: BCB

Mean Square Error (MSE)[1/]

Projection horizon (months)	Models ARMA		VAR		VAR-SE	n.obs.
1	0.064	**	0.056	*	0.051	59
	(0.026)		[0.086]			
3	0.104	**	0.087		0.071	57
	(0,010)		[0.397]			
6	0.134		0.121		0.104	54
	(0.295)		[0.955]			
12	0.138		0.141		0.115	48
	(0.547)		[0.728]			
24	0.146		0.149		0.117	36
	(0.288)		[0,380]			
36	0.156	***	0.162	***	0.110	24
	(0,000)		[0.001]			

1/ The mse values are multiplied by 10,000. The p-value of the test of Diebold and Mariano (1995) is presented in parentheses and of the test of Clark and West (2007) in brackets. ***, ** and * indicate, respectively, rejection of the null hypothesis of equality of the projections of the model considered in relation to the VAR-SE at 1%, 5% and 10% of significance.

III. Conditional Projections

Revisions and Short-Term Projections

IPCA – Inflationary Surprise

% change

	2018					
	Mar	Apr	May	in the quarter	In the year	12-month up to May
Copom`s scenario[1/]	0.20	0.33	0.26	0.79	1.41	2.94
IPCA realized	0.09	0.22	0.40	0.71	1.33	2.86
Surprise (p.p)	-0.11	-0.11	0.14	-0.08	-0.08	-0.08

1/ Scenario at March 2018 Inflation Report cutoff date

IPCA – Short-term Projections

% change

	2018				
	Jun	Jul	Aug	In the quarter	12-month up to Aug
Copom`s scenario[1/]	1.06	0.27	0.20	1.54	4.23

1/ Scenario at cutoff date

Sources: IBGE and BCB

Conditional Inflation Projections

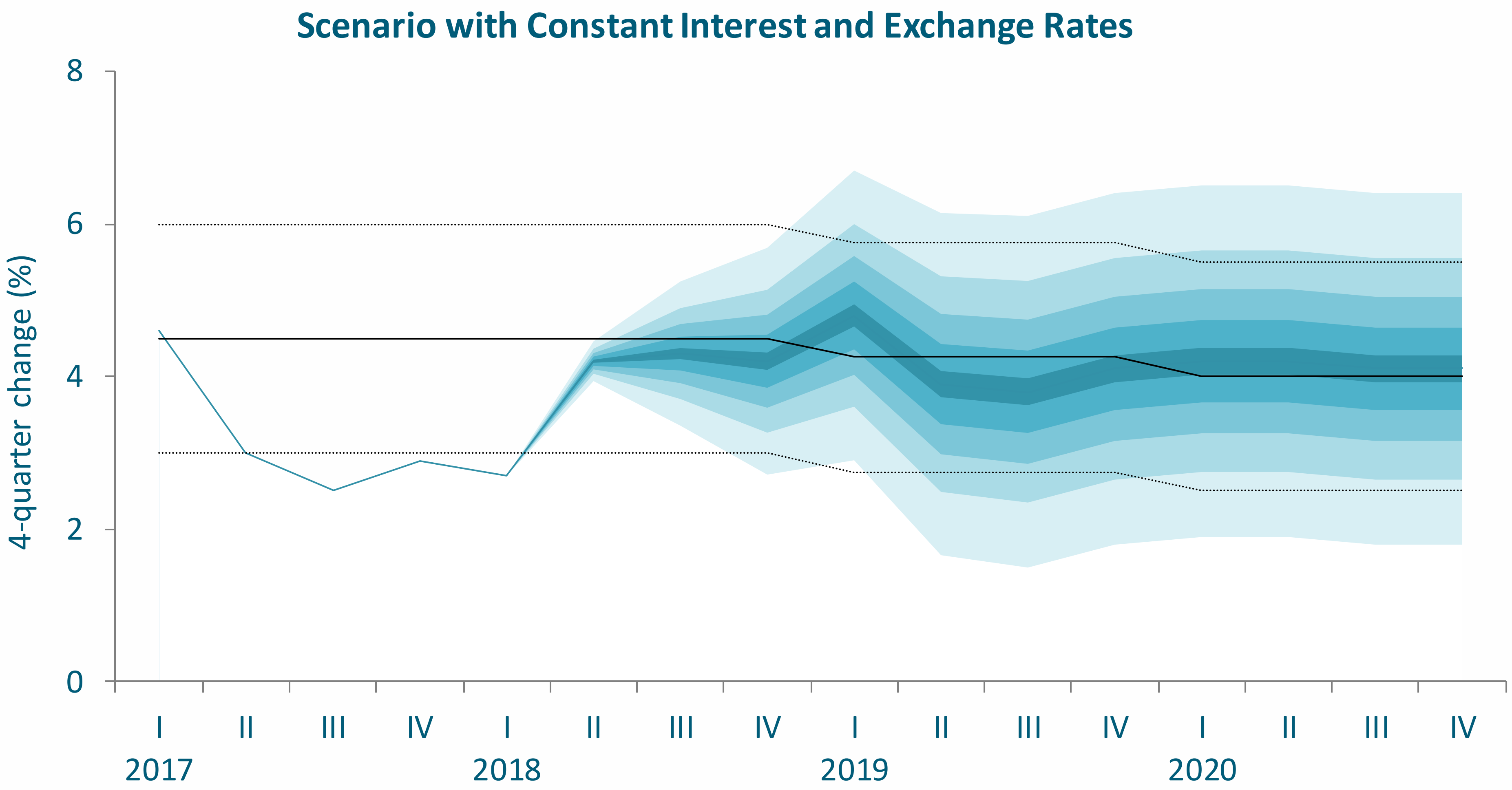
Scenario with constant interest and exchange rates

Period	March 2018 Inflation Report	June 2018 Inflation Report
2018 II	3.3	4.2
2018 III	3.4	4.3
2018 IV	3.6	4.2
2019 I	4.1	4.8
2019 II	4.1	3.9
2019 III	4.1	3.8
2019 IV	4.0	4.1
2020 I	4.1	4.2
2020 II	4.1	4.2
2020 III	4.1	4.1
2020 IV	4.1	4.1

Note: Year-on-year IPCA inflation (%).

Sources: IBGE and BCB

Condicional Inflation Projections



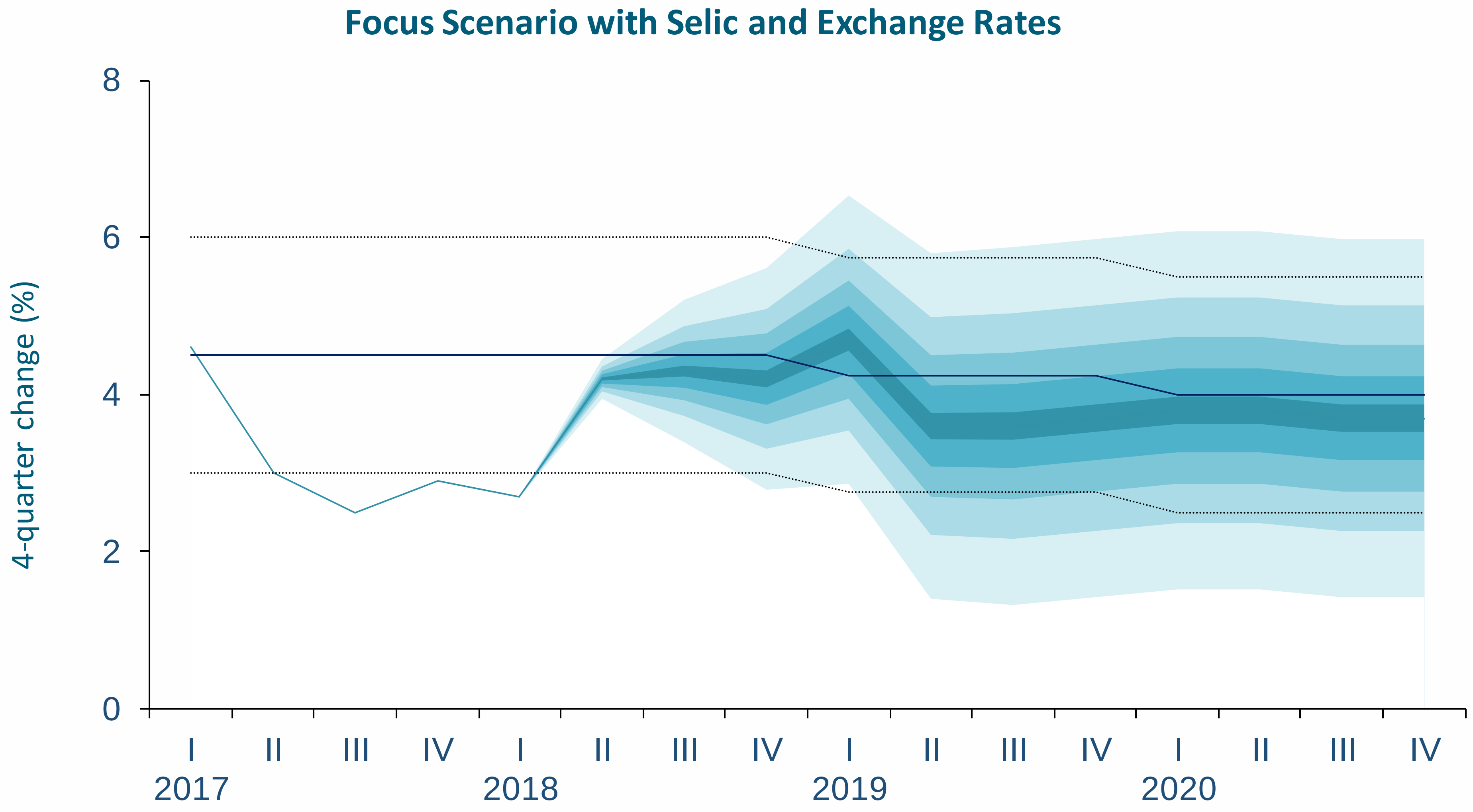
Conditional Inflation Projections

Scenario with Interest and Exchange Rates from Focus Survey

Period		March 2018 IR	June 2018 IR
2018	II	3.3	4.2
2018	III	3.5	4.3
2018	IV	3.8	4.2
2019	I	4.3	4.7
2019	II	4.3	3.6
2019	III	4.3	3.6
2019	IV	4.1	3.7
2020	I	4.2	3.8
2020	II	4.1	3.8
2020	III	4.0	3.7
2020	IV	4.0	3.7

Note: Year-on-year IPCA inflation (%).

Conditional Inflation Projections



Conditional Inflation Projections

Reported Scenarios

Period		Constant Interest and FX Rates	Focus Interest and FX Rates	Focus Interest Rate and Constant FX Rate	Constant Interest Rate and Focus FX Rate
2018	II	4.2	4.2	4.2	4.2
2018	III	4.3	4.3	4.3	4.3
2018	IV	4.2	4.2	4.2	4.2
2019	I	4.8	4.7	4.8	4.7
2019	II	3.9	3.6	3.8	3.7
2019	III	3.8	3.6	3.8	3.6
2019	IV	4.1	3.7	3.9	3.8
2020	I	4.2	3.8	4.0	4.0
2020	II	4.2	3.8	3.9	4.1
2020	III	4.1	3.7	3.8	4.0
2020	IV	4.1	3.7	3.7	4.1

Note: Year-on-year IPCA inflation (%).

Conduct of Monetary Policy – 1

- At its June meeting (215th Meeting), the Copom unanimously decided to maintain the Selic rate at 6.50% per year;
- The Committee judges that this decision reflects its baseline scenario for prospective inflation and the associated balance of risks and is consistent with convergence of inflation to target over the relevant horizon for the conduct of monetary policy, which includes 2018 and, mainly, 2019.

Conduct of Monetary Policy – 2

- On the occasion, the Committee communicated that its baseline scenario encompasses risks factors in both directions:
  - On the one hand, (i) the possible propagation, through inertial mechanisms, of low inflation levels in the past may lead to a lower-than-expected prospective inflation trajectory;
  - On the other hand, (ii) frustration of expectations regarding the continuation of reforms and necessary adjustments in the Brazilian economy may affect risk premia and increase the path for inflation over the relevant horizon for the conduct of monetary policy. This risk intensifies in the case of (iii) further changes in the global outlook for emerging economies. The latter risk has intensified since the May Copom meeting (214th Meeting), whereas the risk that inflation would remain significantly below target over the relevant horizon has diminished.

Conduct of Monetary Policy – 3

- In its balance of risks, the Copom has always had to balance the risk of inflation falling below the target with the commitment to keep inflation down in a long-lasting way. The risk of inflation falling below the target decreased in this balance.

- The Committee emphasizes that the evolution of reforms and necessary adjustments in the Brazilian economy is essential to maintain low inflation in the medium and long run, for the reduction of its structural interest rate, and for sustainable recovery of the economy.

Conduct of Monetary Policy – 4

- The Copom judges that it should base its decisions on the evolution of inflation projections and expectations, of the balance of risks, and of economic activity. Shocks that produce relative price changes should only lead to a monetary policy response to their possible second-round effects (i.e., to the propagation to prices in the economy that are not directly affected by the shock). It is through such second-round effects that these shocks may affect inflation projections and expectations, and change the balance of risks. These effects may be mitigated by the level of economic slack and by inflation expectations anchored around the targets. Therefore, there is no mechanical relationship between recent shocks and the conduct of monetary policy.
- In their deliberations, Committee members emphasized that this prescription requires an environment with anchored expectations.

Conduct of Monetary Policy – 5

- The effects of the halt in the transportation sector over the scenario were assessed by the Committee. It was agreed that the baseline scenario encompasses significant temporary effects of this shock on inflation and economic activity and that the assessment of incoming data will be contaminated by these effects.
- The Copom members discussed possible enduring effects of the shocks faced by the Brazilian economy. All members agreed that in the short term it will be more difficult to evaluate if the economic developments are in line with its baseline scenario for the medium and long terms. This context reinforces the importance of monitoring over time the evolution of the baseline scenario and its risks, and of evaluating the duration of the effects of shocks on inflation (i.e., its second-round effects) in order to ensure that the achievement of low inflation persists, even in the face of adverse shocks.

Conduct of Monetary Policy – 6

- Based on their assessments, the Copom members agreed to maintain the Selic rate at 6.50% p.a. As for the next meetings, considering the high level of uncertainty of the current scenario, the Committee deems it appropriate to refrain from signaling the next steps in the conduct of the monetary policy.

- In the Copom's assessment, the evolution of the baseline scenario and of the balance of risks prescribes keeping the Selic rate at its current level. The Copom emphasizes that the next steps in the conduct of monetary policy will continue to depend on the evolution of economic activity, the balance of risks, and on inflation projections and expectations

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