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Brazil — Short-term Hurdles and Longer-term Challenges

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I. Introduction

For Brazil, 2015 will be a bad year. Will it be a wasted year as well? The answer goes beyond the short-run macro adjustment, although that in itself is a major challenge. After the vortex of the Lula administrations (2003-2010), the mismanagement of Dilma's first administration (2011-2014), and the troubled consequences of her reelection victory—questioned in popular protests and seen in the abysmal drop of her approval ratings— there are at least three other dimensions to consider. Although monetary policy is of course part of the short-run adjustment it deserves special attention because, as we will show, there have been changes in the central bank's reaction function that cast doubt on its credibility and capacity. There is the related issue of the trajectory of the public debt. Is the likely fiscal effort sufficient to bring it back to a sustainable path? Does the combination of monetary and fiscal policies raise again questions about fiscal dominance? Finally, there is the most difficult question: what are the longer-run prospects? We tackle these in turn.

Linking the short- and long-run prospects in ways that have to do with Brazil's purported development strategy are the recent succession of scandals, most notably at Petrobras, the neuralgic center of the government's investment program. Its collapse is a threat to overall investment which in 2014 dropped 4.3% yoy and will drop further in 2015, possibly by as much as 7-8% yoy. The Petrobras scandal, however, is a manifestation of deeper problems of political governance. As many have commented, Brazil lives with an unwieldy and dysfunctional political organization. The country faces the

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challenge of taming populism in a mass democracy that has vestiges of the last military regime (1964-1984) and, more clearly, the 1988 Constitution produced in its aftermath. The resulting institutional framework is incompatible with the government's capacity to fund itself. The government taxes close to 40% of GDP; spends directly 46% of GDP and indirectly, an additional 10-12% of GDP, mainly through directed credits. Yet, to keep its model of political clientilism operational, the government cannot cut back. On the contrary, to be successful it always needs to spend more.

Its institutions are also incompatible with the demands of "the new middle class," which justifiably wants to hold on to its recent gains but likely will be the first to lose them as other, more entrenched political players, the myriad of corporate "representations," including worker and employers unions, the civil service bureaucracy, existing beneficiaries of the social security legislation, and the like, are better able to protect their share of the shrinking pie.

Brazil's prosperity from 2004 to 2010 was a mirage. It was the product of a large transfer of external resources through favorable terms-of-trade linked to China's takeoff into rapid growth—"the commodity cycle"—and, in 2009, after the "Lehman Moment" at the onset of the Global Financial Crisis (GFC), of China's unprecedented fiscal and credit stimulus. Especially after the GFC, growth was propelled by corporate external borrowing to take advantage of low interest rates in the G3. Throughout this period, and especially after 2008, Brazil's economy was increasingly guided by state interventions and public spending. The public debt increased from 56% of GDP in August 2008 to 66% in December 2014 and corporate external debt increased even faster during the period, by $105.8bn.[2] And yet, in Dilma's first term, GDP growth averaged 2.2%pa and, even worse, productivity in industry averaged a paltry 1.9%pa.[3] Figure 1 shows another measure of productivity, for the whole economy and based on output per employed person, not hours worked. Up to the GFC growth in productivity was reasonable if

[2] BIS data on cross border claims of Brazil on ultimate risk basis, Mar/2013 vs. Dec/2008.
[3] Ratio of the index of real output (base 2012=100) to the index of total hours paid (based 2001=100) from IBGE's monthly industrial survey (SIDRA, Tables 3653 and 1628).

not remarkable, close to 2%pa. It decelerated post the recovery from the crisis and, at last count, measures barely 1%pa. The model of state-led growth was spent.

This note discusses these themes without an attempt to be comprehensive or even systematic but rather in the hope that by bringing together the set of issues it will highlight the challenges, and possible pitfalls, including to the current and surprising turn to "policy responsibility" by the administration.

II. The short-run macro adjustment

What will 2015 look like? Most likely GDP will contract close to 2% yoy, inflation will shoot up to 9-10% yoy, the external current account balance will remain heavily in deficit to the tune of $70-75bn (close to 4% of GDP), the fiscal accounts will show a deficit of 5-6% of GDP (in part because the government interest bill will exceed 7% of GDP) and the public debt will increase to about 62% GDP. In short, it will be a disaster. Will 2016 be better? Yes, but likely not by much; most probably growth will be null to marginally positive, inflation will approach but continue to exceed the midpoint of the target (4.5%) and the public debt will continue to grow on the back of another deficit of 4-5% GDP. The reality is that the adjustment will take time. What was built in terms of misguided tax-concessions, reckless and useless expansion of social services, irresponsible price controls on electricity suppliers, political manipulation of regulatory agencies, and other policies, all of it will have to be dismantled, will take time. The inflation targeting regime survived the many reinventions of policy but its basic objective, to target the inflation target, must be set right again—and this too will demand a change not only in the "dosage" of policy but in the way to do policy, as discussed below.

This is a homemade crisis. Its seeds were planted in Lula's second term when, after the Mensalão scandal in 2005, he re-aligned his government with the union leadership and the pro-statist factions within the PT; after Finance Minister Palocci resigned and was substituted by Guido Mantega.

The structure of heavy-handed interventionism took off in 2009-10, in theory as an "anti-cyclical" response to the global crisis but in practice, as part of the political campaign to elect Dilma. As seen in Figure 3, in the post-2003 period, under the successive PT administrations, of the 3.9%pa average growth rate in total final demand, 3pp is due to the growth in consumption and only 0.9pp in investment. The crisis of 2009 was brief with a sudden recovery already Q4/2009 and with total growth of final demand exceeding 8% yoy in Q3/2010, just in time for the Presidential elections.

Interventionism hardened in Dilma's first administration and took particular shape with the introduction of the "New Economic Matrix" toward the end of 2011. The "matrix" contemplated a closing down of the economy to foreign competition through the enactment of "national content" rules, the systematic deployment of public banks for policy objectives, subsidies to targeted industries and selection of "national champions" at the firm level to receive special dispensations and tailor-made fiscal aid, and a megalomaniacal public investment program to be implemented by state enterprises and financed the private sector was set in place without an overall economic logic or rationale and, in many cases, without a clear social purpose and lacking any measure of benefits and costs.

The administration gave up on fiscal discipline and on the inflation target. The fiscal deterioration was widespread, including a loosening and/or outright breach of the regulations under the Fiscal Responsibility Law with a return to imprudent borrowing by subnational governments and falsification of the fiscal accounts. While in the first Lula administration the primary surplus was kept at 3.6% of GDP, sufficient to produce a decline trend in Debt/GDP despite the sustained expansion in spending, by 2014 the surplus had turned to a deficit of 0.6% of GDP as reported, and in fact closer to 1.4% of GDP if the figures are corrected for under or miss-reporting (see Figure 2).

The outcome was uncertainty, loss of confidence, a precipitous drop in investment and a loss of savings without gains in productivity. Except for a rapid growth in subsidized public investment programs (the legacy of which will show in future quasi-fiscal costs) the investment program never took off. The commodity boom was wasted on consumption, not investment. A number of innovations early on in Lula's first administration helped produce a credit boom in the years leading to the GFC, and credit growth reinforced the expansion in consumption.[4] As shown in Figure 4, even with the GFC, towards the end of 2009 credit was expanding at rates exceeding 25%pa. When the boom was gone, consumption continued, financed by borrowing abroad. And the influx of capital together with the gains in the terms-of-trade in the immediate aftermath of the GFC triggered a significant appreciation of the real effective exchange. As shown in Figure 5, by 2011-2012, the exchange rate was considerably overvalued. The REER had moved to 57% above its pre-crisis long-run average; because of the significant gains in real wages, the wage-to-exchange ratio was 105% above its pre-crisis long-run average. Furthermore, a policy of foreign exchange intervention by the central bank extended the trend appreciation. The policy, which began in 2013 and summed to $120 billion at its peak, the largest program of currency intervention in emerging markets at the time and to this date, provided currency hedges to the private sector by assuming the risk of devaluation; thus, it helped contain inflationary pressures—the true objective of the policy.[5] The loss of competitiveness, especially in manufacturing, was severe.[6]

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[4] These included the regulation in 2003 of wage and pension protected credit (Crédito Consignado); in 2004 a new law of collateral (Lei de Alienação Fiduciária) and in 2005 a new bankruptcy law (Lei de Falências).

[5] The policy was especially effective because it did not cause a loss of reserves with the attendant negative expectations on the currency markets. Rather, the central bank used the derivatives market to swap a futures contract on the exchange rate against an equivalent interest-rate contract. These FX forwards, or swaps as they are called in Brazil, are different from commonly traded currency forwards because they are not settled in US dollars but in reais. When the central bank sells such a forward, it is offering pay the difference between the exchange rate set at the start of the contract and the actual rate at the end, plus a dollar-linked rate of interest. In return, the central bank receives the cumulative overnight interbank rate for the period of the contract, in reais. As long as the exchange rate contract devalued less than the rise in interest rates, tied to the central bank's own Selic rate, the central bank had a profit. Conversely, when the currency devalued rapidly, as it did late in 2014 and early 2015, the central bank absorbed large losses, settled in reais without an impact in reserves but leading to significant quasi-fiscal costs—as we will discuss. See, Garcia, M. and T. Volpon, "DNDFs: A more efficient way to intervene in FX markets?" Rio de Janeiro: PUC, Texto para Discussão No. 621, May 2014 (http://www.econ.puc-rio.br/pdf/td621.pdf)

[6] Manufacturing was badly hit because, given foreign competition, it could not pass on the increases in labor costs which were coming from the expansion of employment in services with a limited increase in labor supply, exacerbated by the impact of minimum wage policy and real appreciation of the exchange rate. In contrast, in

In contrast to what happened in the United States, where consumer imports forced producers out of business, in Brazil the producers themselves organized to retain market share by importing intermediate and finished goods, not risking new ventures at home but maintaining distribution chains and oligopolistic footholds over protected markets. In part because of this, the upsurge in consumption came with a sharp increase in the imports bill which, lately with the downturn in commodity prices, led to a near closing of the trade surplus, hence, as shown in Figure 6, an upsurge in the current account deficit. Moreover, since 2013 FDI inflows are considerably smaller than the deficit.[7] For Brazil, considering the size and volatility of dividend and profits remittances, and their strong positive correlation with movements in the exchange rate, it is debatable whether FDI is indeed a more secure, "permanent" form of external financing. Nevertheless, the fact that presently the deficit far exceeds FDI is an additional source of volatility to the external accounts and by implication to the overall macro picture.

Consumption, government spending and increases in private external borrowing sustained employment. Amazingly, even as the pace of growth decelerated in 2013-2014, unemployment kept falling. In part this was because the services economy was more resilient and it now employs nearly two-thirds of the labor force. As the middle class expanded the pattern of consumption tilted towards services, reinforcing its disproportionate growth. However, in a larger part, the drop in unemployment resulted from a shift in the demographic structure of the labor market (see Figure 7). Comparable data from the PNAD surveys are available for only a short period of time; nevertheless, they show a clear

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services, wage increases were passed on to prices, which helps explain the sustained higher inflation in services and in non-tradables generally (see Figure 8). Profitably in manufacturing decreased which, expectedly, led to a deceleration of investment, hence productivity. In the end, as Affonso Pastore argued, manufacturing faced a combination of increased import penetration, higher wages, lower productivity and stagnant output. See, "Por que a produção industrial não cresce desdse 2010" Rio de Janeiro: IEDE/Casa das Garças, Jun. 2012 (http://iepecdg.com.br/uploads/seminario/indústria.pastore.pptx).

[7] We exclude from the total measure of FDI flows derived from reinvested earnings and from inter-company loans. In April, 2015 the central bank changed its methodology for calculating the balance of payments, adapting it to the latest IMF standards. The main change was in the estimate of FDI: Prior to the change, capital inflows from Brazilian companies borrowing abroad and remitting the funds home where not classified as FDI. Now they are.

decline in the participation rate, notably since 2012. Probable causes are an aging labor force with dwindling new entrants, and an earlier than expected exhaustion of the dividends from the demographic bonus, a time bomb for the already unbalanced social security system and possibly caused by the expansion of government transfers.[8] Nevertheless, in the short-run, the drop in participation sustained the fall in unemployment even when employment growth decelerated—and this, together with large adjustments in the minimum wage, kept real wages and incomes expanding at least until mid-2014, as seen in Figure 5. The outlook now and for the next couple of years is for a reversal in these trends: the return of workers to the labor force, rising unemployment and falling real incomes.

In short, the accumulating imbalances got worse and came to a head in 2014. The fiscal deficit increased to 6.7% of GDP, with the emergence of a primary deficit for the first time since 1997.[9] The current account deficit ballooned to 7.1% of GDP, with financing concentrated on short-run portfolio flows. Inflation shot up to 6.4% despite price controls that, among other things, destroyed Petrobras' profitability and led to the crisis in the electricity sector.

What to do? After some hesitation, the reelected Dilma opted for the inevitable, an orthodox fiscal consolidation. The hallmark of this unexpected and politically bewildering U-turn was the appointment of Joaquim Levy as Finance Minister. Levy came with irreproachable credentials: a PhD from Chicago, early work at the IMF and increasingly visible and successful performances in the civil service as the Chief Economist at the Ministry of Planning and Budget, Secretary of the Treasury, and Secretary of Finance of the State of Rio de Janeiro— each stint under a different administration from a different political party, from Cardoso to Lula, from the PSDB to the PT.

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[8] The hypothesis is that greater accessibility to retirement pensions through social security and transfers through the Bolsa Família program encouraged earlier retirement. On the other hand, the expansion in opportunities for tertiary education could have led to a reduction in the rate of new entrants. Features of the unemployment insurance program could also have led to higher turnover with greater movements in-and-out of the labor force. These negative cyclical effects would be additional to the structural weakening of the gains from the demographic bonus. Credit Suisse, "Prevemos taxa de desemprego na PME de 6,2% em 2015 e 6,6% em 2016." *Macro Brasil*, May 5, 2015. See also footnote 18.

[9] Explain "creative accounting" and fiscal numbers.

However, producing the target of 1.2% of GDP in the primary (non-interest) surplus for 2015, a 2pp turnaround from the primary deficit in 2014, will demand much more than the political system will tolerate. Because the recession will push down real revenue—as it already has, the Government will deliver less and the task for 2016 will be even larger. Most likely, the primary surplus this year will be 0.4-0.6% GDP—and GDP will plummet.

In the new GDP methodology growth was slightly positive in 2014. Even so, there were negative growth rates in the last three quarters of the year, which technically, is a recession. The outlook is for at least another three quarters in recession. If there is a turnaround it will come only in Q4/2015, with a slow recovery in 2016. In this scenario, the adjustment cannot be restricted to eliminating tax concessions and increasing taxes. It must include cuts in expenditure beyond what would be needed to counteract additional spending on the automatic stabilizers (increased outlays for unemployment insurance, expenditure on the safety net and social security). For this, Congressional support will be critical, and it has not been forthcoming.

Minister Levy's six months in office have been impressive. He has shown rare skill in crossing the landmines created by the unusual political landscape: A debilitated President distant and seeking distance from her party; a resurgent yet always unruly Congress reluctantly yielding the limelight to the Heads of the Lower and Upper Houses; the three poles intermediated by the unlikely Vice-President who shares the party affiliation of the Heads of Congress (PMDB) but not their sympathies; the three men engulfed by the reigning political scandal, seeking the demise of the PT, and the leadership of the now dominant political center, the PMDB. In the midst of opposition from the PT and silence from the President, Levy pushes through the fiscal adjustment. His proposals have been diluted, but on his credentials and promises rest the hesitancy of the downgrade from the rating agencies. He will not deliver the full fiscal adjustment but, perhaps more importantly, he may deliver the turnaround in economic policy making. This together with Petrobras' capacity to limp along and seek support from the

Chinese (who else?) upturned foreign confidence, enough to draw-in portfolio flows and keep the balance of payments funded.

Favorably, Levy buys time for Brazil; the crisis is avoided on a vote of confidence. The question remains, however, will the political will endure through at least 2016 to deliver the requisite adjustment, not only the promise? So far, the economy is in free fall with accelerating inflation. Some adjustments are in place and they may, likely will, prevent a crisis. They may not be enough however to restore confidence; and restoring confidence is one of the few paths for ending the recession. To begin with, if part of the problem is economic, the obstacles are mainly political.

At present, Congress holds more power than it has at any point in the 30 years since the return of democratic rule. Moreover, beyond today's political urgencies are unresolved issues of political representation. How can the system and its governance change to make them compatible with a well-functioning private economy that supports, and is regulated by, the public sector but is not subjugated to it. Key political institutions are outdated. Consider the structure of labor laws imported from Fascist Italy in the 1930s and enacted into law in 1943. At the time, these laws served the role of regimenting/coopting a nascent urban industrial working class, a minority group gaining limited political access in an oligarchic society dominated by rural elites. What the state then granted in the form of support was a pittance. The size and influence of the targeted population was small, if not miniscule. Fast-forward 70 years and the kinds of rights and benefits of that minority make little sense in a predominantly urban, educated labor market of nearly 40 million workers. Nevertheless, the law has not changed. The separate, duplicate, legal systems for labor and civil laws prevail. What is worse, the political system has been incapable of organizing a constructive debate on how to change the situation. The few changes that were accomplished (for example, limiting some of the excesses of the social security legislation) were the product of crises and disruptions. The Constitution of 1988, while advancing greatly in matters related to democratic representation, failed to discipline the role of the government. On the contrary, it created new constitutional rights that, while desirable as objectives, show little regard as to how they might be obtained, therefore creating a situation rife for political rent-seeking, clientilism and populism.

In this context, the hope to restart as in the Lula takeover in 2003 is doomed to failure. Another consumer-led recovery is impossible, given the trends in unemployment and real incomes and the contraction in consumer credit. Net exports, which drove the recovery in 2004-2005, will also disappoint, both because of the commodities cycle and the continued dependence on imports at any level of output. The solution would be for a reversal of the retreat in investments. Much of that would depend on the heralded new infrastructure plans of the government which, with political uncertainty and risk-aversion by investors (especially after recent scandals and the anti-creditors response of the Courts, so far, in protecting owners against bondholders of defaulted paper issued by the now bankrupt construction companies), is more wishful thinking than reality. In section 4 we turn to the longer-run challenges: Our sense is that Brazil is confronting a long period of low growth, a return to its normal path after the mirage of what Edmar Bacha aptly called the "external bonanza" of the period 2005-2011.[10]

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[10] Bacha, E.: "Bonança Externa e Desindustrialização: Análise do Período 2005-2011" Rio de Janeiro: IEDE/Casa das Garças, Jun. 2012 (http://iepecdg.com.br/uploads/seminario/120629BONANÇA%20EXTERNA%20E%20DESINDUSTRIALIZAÇÃO.pptx). In a fascinating presentation, Ricardo Paes de Barros (Seminário sobre "Desafios ao Crescimento Inclusivo Brasileiro", IEDE/Casa das Garças, May 2015 (http://iepecdg.com.br/uploads/seminario/Casa%20das%20Garças.pptx)) asks the question of how could Brazil with a low growth rate in average productivity in the period 2001-2011 (about 1.1%pa in his estimate) have had such a high growth rate of per capita income and especially of consumption? His focus is on the large differentials between the consumption deflator in the national accounts and the overall GDP deflator. Because the consumption deflator was disproportionally lower, real consumption grew faster than output even after controlling for the change in the share of consumption in GDP (i.e. a shift in the functional distribution of income towards labor). Looking at the PNAD data which shows growth in income commensurate with the growth in consumption in the National Accounts, he finds that real consumption grew faster than real income and especially labor productivity, again because the consumption deflator was significantly smaller than IPCA inflation, the deflator used to obtain real incomes in the PNAD. So far, he has not explained why. However, it stands to reason that a large part of the gap is due to the external transfer of income, via the gains in terms-of-trade and external borrowing.

However, before turning to the longer-run, there is another aspect of the short-run path that merits closer scrutiny: inflation. As noted, our forecast is that inflation will top 9% by yearend 2015 exceeded by far not only the midpoint but also the ceiling of the corridor of the inflation target (IT). This is not an isolated event. The central bank has failed to deliver on the midpoint of the target since 2009. As shown in Figure 8, looked from the prism of market, non-tradable prices—the most central objective of monetary policy for these are the prices more susceptible to the changes in the interest rate—the central bank failed miserably: inflation in these prices was near or above 8% for most of the period 2009-2014. Nevertheless, this was a period of hyperactive policy (Figure 9). In the 77 months between January 2009 and May 2015, the central bank changed its policy rate 36 times, on average about every 2-3 months! Such activism was not driven by the pursuit of the target alone. As we discuss below, at moments it was driven by other policy concerns and not only the usual inflation/output tradeoff. We document below its failed attempt in late 2012 and early 2013 to autonomously drive the policy rate lower on the mistaken belief that it could thereby change the admittedly abnormal but nevertheless historically entrenched regime of high real interest rates in Brazil.

The outcome of this and other experiments was a loss of credibly that now compromises its rediscovered aspiration to pursue again the midpoint of the target, part of the return to orthodoxy in macroeconomic policy.

III. Inflation and the inflation targeting regime

Brazil adopted an IT framework in June 1999 after abandoning a fixed exchange rate policy in the midst of a currency crisis. It was the third leg of the tripod for macroeconomic stability, together with the floating of the exchange rate in January 1999 and Congressional approval of the Fiscal Responsibility Law, eventually in its final form, in May 2000. While the results of the tripod soon proved to be a success and its achievements heralded as a new page in Brazilian macroeconomic management political support was divided and remains so, particularly about the IT regime. The most systematic opposition came from the PT; hence the emblematic symbolism of Lula's decision (already in late 2002 before taking office in January 2003) to embrace IT and the tripod. Lula confirmed this by his steadfast support for his choice of central bank Governor, Henrique Meirelles, during the next 8 years.

In little time, the Meirelles central bank acquired the mantle of "the" IT central bank—a true exponent of the newfound orthodoxy. This is somewhat surprising not only because it stood within the PT administration (that continued its rhetoric of opposition to IT) but also because Meirelles himself was new to IT and to central banking as a whole.

A closer look, however, shows that Lula's first economic team headed by Minister Antonio Palocci backed and defended the tripod. They were well prepared to it by the outgoing team with generous personal contributions from Pedro Malan and Armínio Fraga, the former Minister of Finance and Governor of the Central Bank, respectively. As a result, there was a great deal of continuity in senior policy positions both at the Ministry of Finance and the Central Bank. Moreover, Meirelles himself was a staunch believer in the IT regime having come to the Lula administration as an outsider with an acclaimed trajectory in the banking industry at home and abroad. And Lula himself came to understand only too well that keeping inflation at the target was a key component of his "pact" with the electorate; he learned to respect and trust Meirelles' judgments.

Critically, Ilan Goldfajn, who had personally helped implement the IT regime, and the rest of Armínio Fraga's Board of Directors continued on in the first two and defining COPOM meetings of the Meirelles administration when the central bank increased the policy rate 150bp in succession, bringing the Selic to its historical high of 26.5%. At the time, and despite clear signs of continuing economic slowdown, the minutes of the meeting—the most important signpost to the market—could not have been clearer[11]

> *"... há riscos de a inflação manter-se em patamares elevados, na medida em que a inflação corrente mostra sinais de resistência. Devido aos mecanismos inerciais de formação de preços na economia brasileira, a inflação mais alta de 2002 tem se refletido em inflação ainda elevada neste início de ano... O Copom entende que neste momento, quando a inércia existente na economia transfere o efeito do choque do ano passado para a inflação deste ano, a política monetária deve ser firme, de forma a eliminar o risco de mudança de patamar inflacionário. Desta forma, o Copom avalia ser apropriado um reforço adicional na política monetária."*

In due course, the credibility of the IT regime strengthened as it brought down inflation below 4% by end-2006 (the target was 4.5%) before the commodity shock of 2008 increased it back again to near 6% at that year's end—even as the COPOM embarked in another 500bp tightening cycle that would stop only after the Lehman moment and clear signs of the onset of the GFC.

The 2009 crisis-induced drop in inflation was, however, misdiagnosed and it marks a turning point for the IT regime.[12] The drop in domestic demand albeit large was transitory. Activity rebounded already in Q2 2009; by Q4 2009 final demand was expanding at close to an annualized rate of 8%. The rate cuts in June, July and August 2009 where ill-judged; inflation rekindled in 2010 as did the economy

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[11] Minutes of the 81st Meeting of the COPOM – February 18 and 19, 2003 (http://www.bcb.gov.br/?COPOM81).

[12] For statistical evidence of the turning point, see, inter-alia, Alecci, A. "Structural Brakes in Brazil's Monetary Policy Reaction Function," New York: Tandem Global Partners, November 2011 (unpublished). Nomura: "Brazil: What Would a Hawkish Board Do?" *Strategy Insights*, March 20, 2015. Goldman Sachs: "Brazil: Skewed Preferences over Inflation Deviations from Target." *Latin America Economics Analyst*, October 17, 2014. Pastore, A. "Mudanças na Reação do Banco Central," in *Inflação e crises – O papel da moeda*. Rio de Janeiro: Elsevier Editora, 2015, pp. 258-264. Pastore finds a break in 2007/Q1, however he notes that the methodology he used "did not determine a precise point for the break." Footnote 18, p.258.

both propelled by Chinese policies that prompted a burst in commodity demand and prices. Belatedly, the COPOM started a new hiking cycle in April 2010 and followed it through, hesitantly, through July 2011 when inflation was above 7% significantly above the top of the IT interval (6.5%).

What happens next is the exercise of the "new economic matrix." Starting in Q3 2011, obsessed by the sharp deceleration in domestic demand and concerned by developments abroad (the European crisis and global slowdown) the Dilma administration went full-force with the program of fiscal- and quasi-fiscal-led growth through the public banks. As discussed earlier, it increased protectionism and adopted sector and even product-specific interventions through price controls and tax concessions. Meanwhile, the central bank espoused "macroprudential policy" as an additional tool for monetary control, and attempted to implement an enduring policy dream.

There is this puzzle about Brazilian interest rates. Why are they so high? Is it something structural, linked to the institutions and makeup of Brazilian capital markets, or is it mainly a leftover from a previous era of high inflation, fiscal financing of budget deficits, low growth, low credibility and high volatility?[13] A key finding of the 1980s literature on stopping high inflation using heterodox "shock" approaches was that, in a regime of persistent monetary financing of budget deficits, a given amount of seigniorage revenue can be collected at either high or low rates of inflation. The dual equilibria imply that the economy may be stuck at a high inflation equilibrium when, with the same relative budget deficit, it could be at a lower inflation rate. As Michael Bruno noted in his seminal paper on this topic, "Which is the relevant equilibrium depends on how economic agents form expectations and adjust

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[13] See for example: A. Segura-Ubiergo: "The Puzzle of Brazil's High Interest Rates." IMF Working Paper Wp/12/62, Feb. 2012; Goldfajn, I., and A. Bicalho, “A Longa Travessia para a Normalidade: Os Juros Reais no Brasil,” in Novos Dilemas da Política Econômica - Ensaios em Homenagem a Dionisio Dias Carneiro, edited by E. L. Bacha e M. B. de Bolle. Rio de Janeiro: Grupo Editorial Nacional, 2011; E. Bacha: " Além da Tríade: Há Como Reduzir os Juros?" Casa das Garças, Rio de Janeiro, Oct. 2010; Arida, P., E. Bacha, and A. Resende, “Credit, Interest, and Jurisdictional Uncertainty: Conjectures on the Case of Brazil,” and Carlo A. Favero and Francesco Giavazzi "Why are Brazil’s Interest Rates so High?" both in Giavazzi, F., I. Goldfajn, and S. Herrera: *Inflation Targeting, Debt, and the Brazilian Experience, 1999 to 2003*. Cambridge, MA: MIT Press, 2005; Miranda, P. and M. Kfoury: "A Taxa de Juros de Equilíbrio: uma Abordagem Múltipla," Banco Central do Brasil, Trabalhos para Discussão, Brasília nº 66, February 2003; and the literature cited therein.

prices and other nominal magnitudes (wages, money and/or exchange rates) while learning about the system."[14] The idea being that, post-adjustment, and given the fiscal consolidation that reduces the need for monetary financing, it may happen that the economy remains stuck in a "bad" equilibrium with high inflation instead of moving to the desired low inflation equilibrium. The path leading to this suboptimal outcome is institutionally dependent. However, once at the "bad" equilibrium, even after institutions change so that the attainment of the better equilibrium is now possible, the economy may remain "stuck" at the old one—it does not travel endogenously to the better outcome. And, mutatis-mutandis, the same argument could be made about the post-adjustment neutral real rate (the policy rate that keeps inflation at the target when the output gap is closed and inflation expectations are at the target).[15]

Starting in its meeting of August 2010, the COPOM added the following paragraph to its minutes:[16]

> *Como consequência da estabilização e da correção de desequilíbrios, as quais determinaram mudanças estruturais importantes, o processo de amadurecimento do regime de metas se encontra em estágio avançado, e isso se reflete favoravelmente na dinâmica da taxa de juros neutra e na potência da política monetária. Evidências a esse respeito são oferecidas, entre outros, pelo cumprimento das metas para a inflação nos últimos seis anos, ao mesmo tempo em que as taxas reais de juros recuaram. Progressos na estrutura dos mercados financeiros, redução do prêmio de risco cambial e do inflacionário, entre outros, parecem ter determinado redução significativa da taxa neutra. Também contribuiu para isso a geração de superávits primários consistentes com a manutenção de tendência decrescente para a relação entre dívida pública e PIB. Em outra perspectiva, alguns desses desenvolvimentos, combinados a outros, como o alargamento de prazo dos contratos, também sugerem que o poder da política monetária no Brasil vem aumentando ao longo dos últimos anos. Apesar de reconhecer que um elevado grau de incerteza envolve o dimensionamento de variáveis não observáveis, o Copom considera que as estimativas mais pessimistas sobre o nível atual da taxa de juro real neutra tendem, com probabilidade significativa, a não encontrar amparo nos fundamentos. O Comitê também pondera que há*

[14] Michael Bruno, "Econometrics and the design of economic reform." *Econometrica*, Vol. 57, No. 2 (March 1989), p. 5.

[15] See, for example, M. Garcia, "Brazil in the 21st Century: How to Escape the High Interest Trap?" Rio de Janeiro: PUC, Texto para Discussão No. 466, Jan. 2004. Garcia motivates his model on the external constraint where foreign loans have to be fully collateralized with international liquidity. In one regime, the amount of internationally accepted collateral is limited.

[16] Minutes of the 153rd Meeting of the COPOM, Par. 19.

evidências de que a tração da política monetária aumentou no passado recente e, comparativamente ao que se observava há alguns anos, atualmente pressões inflacionárias são contidas com mais eficiência por meio de ações de política monetária.

It seems that in mid-2011 it decided to act on those ideas. In the period from August 2011 to October 2012, the Committee reduced the policy rate continuously from 12.50% to 7.25% bringing it to the lowest level ever in IT period (see Figure 9). Inflation decelerated in the second half of 2011 and into the first quarter of 2012 but not to significantly below 5%; it reaccelerated starting in July 2012. Nevertheless the COPOM continued to cut the policy rate and would revert only in April 2013 when inflation was back up again to the ceiling of the target (6.50%). In March 2013, the real policy rate was 0.6% (1.7% deflated by 12mo-ahead inflation expectations) clearly below any reasonable estimate of the real neutral rate notwithstanding any possible progress in the implementation of the IT regime. The reality is that the conditions were never there for the central bank to attempt the experiment of "bumping the rate to the good equilibrium" whatever the merits of the dual equilibria hypothesis would be. Admittedly, there is ample evidence that the structural underpinnings for a more effective implementation of monetary policy improved in the period. To begin with, the share of credit in the economy increased from about 33% of GDP in 2007 to 53% in 2014, with growth in household credit somewhat faster, and this undoubtedly helped the transmission mechanism. Moreover, there were important demographic shifts in the labor market that caused a significant drop in the NAIRU,[17] likely in the neutral rate.[18] The point is, however, that these isolated changes were not enough; the dual

[17] S. Alves and A. Correa estimate that circa 1999-2000 the NAIRU was around 11-12% falling to 6.3% by 2012. Alves, S. and A. Correa: "Um Conto de Três Hiatos: Desemprego, Utilização da Capacidade Instalada da Indústria e Produto," Banco Central do Brasil, Trabalhos para Discussão Brasília n° 339 dezembro 2013.

[18] A recent estimate suggests that the real neutral rate was running at about 2.5-3% by mid-2013, down from close to 10% in early 2005. About 200bp of the decline was due to the drop in global rates; another 100bp due to the drop in sovereign risk. Financial deepening (the increase in the ratio of credit-to-GDP) and lower public debt were the main other explanatory variables. In contrast to the claims of the COPOM above, inflation performance was not a major contribution, at least since 2007 (p.17). Perrelli, R. and S. Roache: "Time-Varying Neutral Interest Rate—the Case of Brazil," IMF Working Paper Wp/14/84, May 2014. Goldfajn, I. and A Bicalho, *op. cit*., find that the long run neutral rate at end 2009 was closer to 7% (p. 16, Figure 3). Perrelli and Roache claim that, in contrast to the robust results in A. Orphanides and J. Williams' seminal paper "Robust Monetary Policy with Imperfect

equilibria hypothesis may have been wrong to start with as an explanation for why the Brazilian economy operates with unusually high real rates. The actions by the central bank were part wishful thinking, part political expediency in following through with the precepts of the "New Economic Matrix" that were, meanwhile, leading to outright fiscal imprudence coupled with extensive price controls and, in general, the breakdown of macroeconomic stability.

The shift in the central bank's reaction function can be traced empirically. We estimate two forms using structural (or identified) Bayesian VAR specifications. The first, canonical form considers only the three interdependent variables: inflation and output gaps and the policy rate (Selic): $X_t = [y_t, \pi_t, r_t]$.[19] The second form adds a numbers of controls, or exogenous variables: a measure of the global trade cycle; a measure of the cycle in commodity prices; the US Fed rate. All data were taken from the Bloomberg data base, and detailed descriptions are given in the data appendix. The data are monthly and consider two subsamples 2003/01-2008/12 and 2009/06-2014/07.[20] The estimation output is shown in the data appendix.

Of interest is the estimated response of the Selic (i.e. monetary policy) to shocks to either inflation or output. In the first subsample the inflation gap is defined conventionally as the difference between inflation expectations 12mo-ahead and the inflation target set for that date. In the second

Knowledge," *Journal of Monetary Economics*, Vol. 54, 2007, 1406-1435) "the costs of incorrectly estimating the neutral rate are likely to be low" (p. 28). What happened to inflation and the macroeconomy in Brazil as a result of the COPOM's mistakes in 2011-12 would seem to prove them wrong.

[19] This VAR system may be formally derived as in Clarida, R., J. Galí and M. Gertler: "The Science of Monetary Policy: A New Keynesian Perspective," *The Journal of Economic Literature*, Vol. XXVII, 1999, 1661-1707. The first equation (y_t) is the IS curve, the second equation (π_t) a Calvo-type Phillips curve, the last equation (r_t) characterizing the behavior of the monetary authorities. For the derivation see, for example, Ciccarelli, M. and A. Rebucci: "Bayesian VARs: A Survey of the Recent Literature with an Application to the European Monetary System." IMF Working Paper Wp/02/102, May 2003, Section VI.

[20] All estimated VARs satisfy the stability condition (i.e., no roots of the characteristic polynomial lie outside the unit circle) and all include 3 lags which is the lag order selected by both the Schwarz and Hannan-Quinn information criteria. Residual tests for residual heteroskedasticity (White's test with no cross terms), non-normality (Cholesky ortogonalization) and residual serial correlation reject the null hypotheses at probability levels of 5% or less.

subsample it is defined as the difference between current inflation (the year-on-year change in the full IPCA index) and the ceiling of the inflation target (set at 6.5% for the entire period). The reason for this is the clear disregard the COPOM had during this period for attaining the midpoint of the target. Though not formally, in practice and through its commentary it became clear that the objective of the Committee was to keep inflation below the target ceiling, and the estimated results using this definition are not only more logical but also more robust.

Figures 10a and 10b show the results for the canonical model: The impulse response functions of Selic to a one standard deviation inflation gap and output gap innovations from the estimated VAR model.[21] The contrast between the subsamples is evident and the differences are statistically significant. In the first subsample, a shock to inflation prompts a quicker and larger response in the Selic which, as we know from the historical evidence, prompted a fast return to the inflation target. In the second subsample, the response is muted accumulating in the first 10 months 15% of the corresponding effect in the first subsample. As in other estimates,[22] the peak of the response is within 9-10 months, but the shock produces long tails with the Selic normalizing fully only after about two years.

Figure 10b shows the results to shocks to the output gap. In this case, the responses of the Selic are fairly similar in both subsamples—in the first subsample the initial response is smaller but past the first 6 months it builds up to a larger effect. Considering the accumulated response after 10 months, the results between the two subsamples are virtually the same.

The data sums up quite well the intuitive interpretation: First into the GFC and then into the period of the "New Economic Matrix" the COPOM was less concerned with bringing inflation into the center of the target responding more feebly to inflation shocks; meanwhile, it responded as fast and as

[21] The estimated reaction functions for the COPOM produce the expected "price puzzle" common to the literature employing structural VARs to estimate monetary policy reaction functions. We discuss this finding in the Appendix.
[22] References.

decisively as before to shocks to output, which in this case were mainly negative. The COPOM was more concerned with sustaining output than with making sure that inflation returned quickly and convincingly to the midpoint of the target. By doing this, systematically, it eroded the credibility of IT regime contributing to the onset of a period of macroeconomic instability.[23]

This conclusion stands when we consider the effects of external variables. Figures 11a and 11b show the results for the model estimated with three additional exogenous variables: measures of the cycle in global trade and commodity prices, and the Fed funds rate. The variables have a significant and quantitatively relevant impact on the VAR estimates. They also have, as expected, a stronger impact on the economy and policy in the second subsample, after the beginning of the GFC. In this second set, the response of the Selic to an inflation shock in the first subsample is just as fast as under the canonical specification but stops somewhat shorter, peaking after 6 months. After 10 months, the accumulated response is close to 10% less than that estimated with the canonical specification.

The biggest difference, however, is in the second subsample. With the added external variables, the response of Selic to a shock of inflation is 3.4 times larger than in the estimate of the canonical model. Now the accumulated response after 10 months is 55% of the equivalent specification for first sample. The large swings in the external trade and commodity cycles in the period 2009-2014, as well as the Fed at ZIRP, help explain the period specific covariation between the Selic, inflation and output. Controlling for this effect, monetary policy in the period 2009-2014 is found to be more responsive to inflation shocks. Nevertheless, the gap with respect to the first subsample is still significant: a tardier and less decisive response that compromised the credibility of the IT regime.

[23] As argued in a recent paper, Brazil has a weaker track record on anchoring expectations than Chile and Mexico, and the credibility of the BCB and fiscal authorities was further dented over recent years. Pooter, M., P. Robitaille, I. Walker and M. Zdinak: "Are long-term inflation expectations well anchored in Brazil, Chile and Mexico?" Washington DC, US Federal Reserve Board, March 2014. (http://www.federalreserve.gov/newsevents/conferences/DePooterRobitailleWalkerZdinak.pdf)

IV. Fiscal dominance, once gain

With the abrupt return to orthodoxy in Dilma's second term, the Copom reversed course. Minister Levy's determination to end the various subsidies and tax concessions that were helping repress inflation led to a spike in inflation of administered prices to rates of 13-14% yoy in Q2/15; this in addition the sudden depreciation in exchange rate provoked by the shock to confidence at end 2014 and early 2015, with a quick passthrough to prices. Inflation could unhinge and get out of control. There was in effect no alternative: In its latest hiking cycle the Copom delivered already 225bp and there is possibly another 75bp to go, bringing the Selic rate back up to 14%pa.

Not that this will be enough to reach inflation at the midpoint of the target as the Copom insists it will deliver by end-2016. For that, even with the recession, it would have to do more. For inflation is now highly inertial with the diffusion index of items in the IPCA with monthly price changes at near record highs of 68-70%. What is required, rather than a shock to interest rates, is a policy that pre-commits credibly to holding the rate at an appropriately contractionary level until inflation drops to the midpoint of the target; i.e., in exceptional circumstances, a backward-looking but strong central bank. This is hard for the present Copom to do. With little credibility, the market expects it to cave in when activity bottoms and political pressure rises; to reverse course, again, even if inflation remains high. The end result may be the worst of both things: high and volatile interest rates and persistent high inflation.

Moreover, the orthodox experiment, if it fails, will leave a problematic legacy. In March 2015, the implicit cost of the public debt reached a record of 24.3%pa, with the total 12-month accumulated interest bill surpassing 7% of GDP.[24] This staggering total is, in part, the burden of the debt indexed or price according to the Selic—a product of the central bank's decisions. It includes the cost of interest rate subsidies granted by the Treasury, mainly but not exclusively to the National Development Bank-

[24] As reported in "Selic dificulta queda do custo da dívida," *Valor Econômico*, May 11, 2015.

BNDES.[25] And it is due also to the losses incurred by the central bank from its interventions in the foreign exchange market, as discussed above.

All of which means that, with low growth, a small fiscal effort and a hefty real interest rate, the trajectory of the public debt-to-GDP ratio is not sustainable, in the sense that it will not converge to a stable or declining ratio. And this, in turn, raises the specter of fiscal dominance over monetary policy. It is an old debate with echoes of the crisis in 2002 and at the start of the first Lula administration in 2003.[26] Presently, however, the combination of variables is more worrisome: without an external "manna from heaven" growth is likely to disappoint, and the political will to produce again primary surplus in the range of 3-4% of GDP is simply not there. On the other hand, monetary policy should do what it has to do, responsibly. As Ilan Goldfajn argued back then, it is not that the size or composition of the debt stock is irremediably set or that there is no fiscal space to do the requisite fiscal adjustment. Far from it, the political challenge is to cut redundant and wasteful current expenditure possibly even with a reduction in taxation. The difficulty is envisaging the political framework that will produce this in anticipation rather than in response to events.

In Figure 12 we show our estimate of the trajectory of debt-to-GDP ratio under current plausible if not optimistic assumptions. In our base case, we assume real growth 0f 0.5% in 2016 and 2% thereafter; a primary surplus of the consolidated public sector of 1.2% of GDP in 2016 increasing to 2% thereafter including small surpluses in states and municipalities and in the SOEs accounts; a stable ratio of base money to GDP, a stable ratio of Treasury debt with the central bank, and a modest decline in reserve requirements as a share of base money; a gradual increase in the administered long-term rate

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[25] The mechanics are well explained in Almeida, M. "Faz sentido um novo empréstimo para o BNDES?" *Blog do Mansueto Almeida*, Feb. 16, 2011, https://mansueto.wordpress.com/2011/02/16/faz-sentido-um-novo-emprestimo-para-o-bndes/.

[26] The first salvo was Olivier Blanchard's paper "Fiscal Dominance and Inflation Targeting: Lessons from Brazil," eventually published in Giavazzi, F., I. Goldfajn, and S. Herrera: *Inflation Targeting, Debt, and the Brazilian Experience, 1999 to 2003*. Cambridge, MA: MIT Press, 2005. An answer arguing why fiscal dominance was then not applicable came in, Goldfajn, I.: "Are there reasons to doubt fiscal sustainability in Brazil?" in *Fiscal issues and central banking in emerging economies*. BIS, October 2013. (http://www.bis.org/publ/bppdf/bispap20.pdf)

(TJLP) that is critical for the size of interest rate subsidies in the budget, hence for the implicit cost of the debt;[27] a path of the Selic that increases to 14% in 2015 but drops to 8.5% by 2020 with an average spread of 150-200bp for the average duration of new domestic debt placed by the Treasury; finally, we assume that the Brazil 5yrs CDS spread will decline gradually from 250bp to 230bp by 2020, no change in the share of new external debt, and a gradual path of increase in the US 10yr Treasury rate to 3.75%. In an alternative, more positive scenario, we bump growth up to 1.5% in 2016 and 3% thereafter; the primary surplus to 2% of GDP in 2016 and 3% thereafter.

What the simulations show is what the market already fears, despite reassurances from the ratings agencies. The road to 2018, the next election year, is a difficult one. In the base case scenario the ratio of debt-to-GDP increases in 2015 and 2016 (as it would do in almost any scenario) and then stabilizes, falling very gradually thereafter. In the alternative scenario, relief comes already in 2017; not surprisingly, faster real growth and a greater fiscal effort do the trick. The bottom line is that any fiscal slippage could trigger market volatility. This could mean a negative feedback loop on capital flows, the exchange rate and inflation with, ultimately, negative impact on GDP growth hence the debt trajectory. On the other hand, arguments of fiscal dominance may be again alarmist. There seems to be a relatively fast response of debt sustainability to reasonable fiscal effort.

The point, however, is to re-emphasize the precariousness of the short-run. To repeat, while there may be comfort in looking back to the quick adjustment of the economy to the last crisis in 2002-03 it would be a mistake to believe in a repeat under current conditions. Even if the composition of the debt is more favorable today, with longer maturities and, of import, and in stark contrast to 2002, a net external creditor position of the consolidated public sector, a more adverse global outlook and deeper

[27] We assume a terminal rate of 7.5% by 2018. Full convergence between the TJLP and the Selic while desirable would be impractical under current conditions. Because the administration imposed maximum rates of return in awarding concessions for public services and government-funded infrastructure projects, a disproportionate increase in the TJLP (some would say above 7%) would either require a full re-contracting or cause providers to abandon the projects.

domestic imbalances mitigate against a quick adjustment. The political overlay is also more problematic. Instead of a fresh administration invigorated by widespread goodwill to the task of redressing social wrongs, we face a deeply divided and segment polity looking inwards to its survival, without a coherent vision for the longer-run.

This said, as we turn to look into this longer-run, we may conclude that it will be easier to get out of the current recession and macroeconomic instabilities than to achieve rapid and sustained growth afterwards.

IV. The longer-run

After an initial burst of significant microeconomic reforms during Lula's first term in government, the last two PT administrations, misdiagnosing the external commodity boom for a new source of home- grown growth, attempted to create a peculiar and distorted "virtuous circle": a high-wage and high- employment economy with little competition from abroad (or even domestically), focused on the production of so-called "wage goods" and correlated domestic-made capital goods, mainly in the energy subsector. The goal was to create a form of state capitalism operating through the private sector and with a bias towards "the new middle class."

What was created in reality was an economy with an ever-expanding state engaged in multiple transfer programs. An economy with pervasive state interference in investment decisions and in price-setting mechanisms, without actively redistributing income except through the minimum wage, other labor-related legislation, and an expansion of safety net (the Bolsa Família program), latterly mainly for political expediency.[28] There were no structural changes in taxation and in the pension system, the two most damaging and inequality-producing platforms of public policy. There was no rationalization of the structure of incentives and protection; on the contrary, subsidies and support programs were enlarged and made even more pernicious. The functioning of regulatory agencies was debased and manipulated with for political aims, and public interference with property rights increased.

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[28] C. Zucco: "When Pay Outs Pay Off: Conditional Cash-Transfers and Voting Behavior in Brazil 2002-2010" *American Journal of Political Science* Vol. 47 No. 3, 2013, 810-822. (http://www.fgv.br/professor/cesar.zucco/files/PaperAJPS2013.pdf) L. Chitolina, M. Foguel and N. Menezes in "The Impact of the Expansion of the Bolsa Família Program on the Time Allocation of Youths and Their Parents" Insper Working Paper WPE: 326/2013, August 2013, find however that 2007 expansion of the program "had a positive and significant impact on school attendance, helping bridge 25% of the gap in school attendance between rich and poor households, and on the decision of young people to study and work at the same time." (http://www.insper.edu.br/working-papers/working-papers-2013/the-impact-of-the-expansion-of-the-bolsa-familia-program-on-the-time-allocation-of-youths-and-their-parents/)

The model ultimately failed. It could not be sustained without the massive international transfer of resources associated with the commodity boom. Instead of creating a "new platform with local content industries," it induced a boom of imported consumer goods complemented by inefficient producers of capital goods. Luckily, the backbone of efficient and competitive agribusiness exporters survived and prospered.

Policies to induce higher wages without corresponding gains in productivity, and to subsidize lending for capital investment through the state banks, led to capital deepening in the more competitive sectors (mainly, agribusiness) and to shrinking profit margins—hence, investment—elsewhere.[29] Potential GDP decreased, to the point that it is now below 2%pa or less.

Low potential GDP, coupled with below-potential outcomes, are huge hurdles for the just-launched program of macroeconomic (mainly fiscal) adjustment.[30] Without growth, job losses during the adjustment are larger. Indeed, everything is more difficult. Presently, to get growth back, macro adjustment is not enough—though it is, as always, indispensable. The year 2015 is not 2003. Then, absent the external constraints and mistrust of the new administration, ample excess capacity, a return of confidence and a buildup in latent domestic demand sufficed to trigger a robust supply response, soon turned exuberant thanks to the added external impulse. Of essence today is confidence with a

[29] From 2002 to 2012 unit labor costs (ULC) in Brazilian industry increased on average 9%pa whereas in the same period they dropped 1.4%pa in Germany and 5.2%pa in the US. In the period, real wages grew 1.8%pa; labor productivity, 0.6%pa; and the USD exchange rate appreciated 7.2%pa. CNI: *Informativo CNI*, Vol. 1 No. 1, January 2015. (http://www.fiemt.com.br/arquivos/1785_notaeconomica01-competitividade.pdf) The National Confederation of Industry (CNI) periodically prepares a ranking of the competitiveness of Brazilian industry measured against 14 countries (Argentina, Australia, Canada, Chile, China, Colombia, India, Mexico, Poland, Russia, Turkey, South Korea, South Africa and Spain). Among them, Brazil ranks next to last beating Argentina. CNI: *Competitividade Brasil – 2014*. Brasília, 2015.

[30] In a recent note, Pastore, A., C. Pinotti and M. Gazzano observe:

> *"Using our estimate of gross fixed capital formation in the fourth quarter last year, we arrived at an estimate of potential GDP growth slightly below 1%, and by all evidence this rate will tend to fall more in the coming quarters. Brazil is losing its capacity to grow, not only because of the shrinking investment rate, but also due to the fall in productivity, and contraction of aggregate demand must also be added to this picture."*

In, "How Severe Will the Recession Be?" February 9, 2015.

correlate reduction in political and economic. The surest way to it is through the agenda of structural change. Because Brazil is not a leader in technology, it is unrealistic to think that an endogenous burst in innovation will open the road to new investments as occurred with the IT revolution in the United States in the mid-1990s. In Brazil, the private sector alone cannot do it. There is a critical role for public policy that galvanizes public-private leaderships and draws in new more productive private investment. This call, however, is not for yet another turn in the failed policies of "national developmentalism" that marked Brazilian policy-making during the military regime (1964-1985) and, strangely enough, through the New Economic Matrix, the Dilma-I administration.

For while the doctrine of "national developmentalism" was discredited it never vanished and soon enough a "new developmentalism" surfaced in the policy discourse with the same premise that the economy of Brazil is fundamentally different from other economies, not only in its institutions, incentive frameworks and productive structure, but in its social genesis, its historical path of insertion in the global economy, and vocation.[31] These elements combine to undermine or invalidate the precepts of "normal economics"—particularly macroeconomics—and call for a new form of state activism.

While avoiding the excesses of the old "dirigisme" the state must nevertheless develop and implement a national development strategy; it should provide stimulus for the creation of large, globally competitive national conglomerates including special lines of support for the internationalization of Brazilian firms; it should target growth of selected industrial sectors.[32] Moreover, "although the

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[31] See, Bielschowsky, R. "Pensamento econômico brasileiro: o ciclo ideológico do desenvolvimentismo." Rio de Janeiro : Ipea/Inpes. Série PNPE, nº19, 1988 for the genesis of "National Developmentalism". Although there is no single line of thought guiding the new developmentalism, many of the ideas are found in the papers of Luis Carlos Bresser-Pereira. For a review see his, "O novo desenvolvimentismo e a ortodoxia convencional." *São Paulo em Perspectiva*, Fundação SEADE, Vol. 20, No. 3, p. 5-24, Jul./Sep. 2006. See also, J. Sicsú, L. Paula and R.Michel, "Por que novo-desenvolvimentismo." *Revista de Economia Política*, Vo. 27, No. 4, Oct./Dec. 2007 and the review article by L Mattei, "Gênese e agenda do novo desenvolvimentismo brasileiro." *Revista de Economia Política*, Vo. 33, No. 1, Jan./Mar. 2013.

[32] G. Arbix and S. Martin: "Beyond Developmentalism and Market Fundamentalism in Brazil: Inclusionary State Activism without Statism." Workshop on States, Development, and Global Governance, Global Legal Studies Center, University of Wisconsin-Madison, March 12-13, 2010

Schumpeterian side of the development process and strategic industrial policy are relevant, the demand side is where the major growth bottlenecks unfold."[33] To that extent, the floating exchange rate should give way to a policy that keeps the exchange rate competitive for the export of manufactures, fiscal policy should always have an expansionist bias, and the goal of price stability "should be the objective of all public agencies."[34]

> *Se a inflação estivesse sendo causada pelo aumento do feijão ou da soja, seria o Ministério da Agricultura que deveria apresentar um diagnóstico do problema e apontar soluções. Se a inflação estivesse sendo causada pelo aumento de margem de lucro de forma excessiva por parte da indústria automobilística, seria o Ministério da Indústria e Comércio que deveria apresentar um diagnóstico do problema e apresentar soluções. O Banco Central deveria ser o controlador de última instância da inflação, e não o primeiro e único órgão do Governo preocupado com um problema que é amplo, complexo e com muitas especificidades. Deixar somente o Banco Central responsável por tratar da estabilidade de preços é o mesmo que solicitar a um médico clínico geral para solucionar ora um problema do coração, ora um problema de pele, ora um problema do estômago. Manter a inflação sob controle é algo tão importante que deveria haver uma câmara formada por diversos organismos do Governo – inclusive o Banco Central – e dirigida pelo Presidente da República para deliberar sobre o assunto.*

The main drawback of these ideas is not their misunderstanding about short-run macroeconomic management, although it is grave. The turnabout of policy early in Dilma's second-term is another example of the prevailing pragmatism; it may take a while but given the weight of the corporate sector and the voice of civil society prudent macro policy has a way of imposing itself over-and-above the ineptitude of policy makers. The question, always, is the social cost of the failures and of the adjustments needed to bring the macro framework into stability.

What is worse about the new developmentalism is the naiveté or purposeful misrepresentation of the view about state-led development. At issue is not the debate of state vs. private sector. Rather, it is the issue of state capabilities and the interaction between state policies and politics. Strangely, for a

[33] Thesis 4 of: "Ten theses on new developmentalism." EESP/FGV - Centro estruturalista de desenvolvimento macroeconômico, May 2010. http://www.tenthesesonnewdevelopmentalism.org/theses_portuguese.asp

[34] J. Sicsú, "A Construção de uma Estratégia de Desenvolvimento," in, J. Sicsú and A. Castelar:"Sociedade e Economia: estratégias de crescimento e desenvolvimento." Brasília : Ipea, 2009, p. 26.

doctrine rooted in political economy, the new developmentalism even more so than the old assumes that, as soon as the new policies are in place, a new state will emerge fully equipped and capable. The references are stale: If Korea did it, why not us? To this extent, the new developmentalism joins a long list of debates and ideas marked not so much by their insights as by their voluntarism: if things are not, they will be; intention and collective action suffices to obtain what is proposed. Even after the long history of mismanagement and the more recent evidence of pervasive corruption and venal appropriation of public agencies, functions and funds for private uses, the new developmentalism refuses to see the many forms of state failures; the wholesale appropriation of public policies for private goals; the evidence of pervasive distortions in relative prices, in the allocation of resources, in the creation and maintenance of state monopolies and private oligopolies.

As Regis Bonelli and Samuel Pessôa argue, the policy of national developmentalism produced distorted and hypertrophic industrialization well into the 1980s, setting Brazil apart from the patterns in other developing economies and ultimately resulting in inefficiency and stagnation. When state-led developmentalism was pushed too far during the Geisel administration (1974-1979) a counterforce of pragmatism emerged from within to attempt to tame it, regrettably for other partisan interests.

> *The emphasis placed by Geisel's administration on SOE investment would produce the first split in the association between technocrats and business elites, who feared for their access to public funds and subsidies. In 1975, the business establishment launched a campaign against the "statization" of the economy. Far from ideological, this movement opposed the insulation of the political leadership from the influence of private firms, who wanted to be heard throughout the whole process of decision on the national economy, helping to establish criteria for the activity of the state and the private sector, orienting the use of the SOEs and controlling their expansion, deciding directions for the investment of their savings etc. That is, a return to old-fashioned pragmatism. Indeed, businessmen were fast in discarding liberal reforms, such as privatization, which would have in principle created greater room for private initiative, for they thought them inconsistent with development.*[35]

[35] Castelar, A., R. Bonelli and B. Schneider, "Pragmatic Policy in Brazil: The Political Economy of Incomplete Market Reform." Texto para Discussão No. 1035, IPEA, August 2004, p.9. (http://www.ipea.gov.br/portal/images/stories/PDFs/TDs/ingles/dp_132.pdf)

It took the policy changes of the 1990s to reverse that course, at least partly: trade opening, privatization, deregulation and the elimination of public monopolies, a clearer separation of public from the private realm, the return of foreign investment and macroeconomic stability. The upshot was rationalization with a gain in productivity, sometimes mislabeled as "de-industrialization."[36]

Fiscal failures more often than not are the root of macroeconomic imbalances. The mechanics of "monetary correction" were introduced in the mid-1960s as a means to fund the public National Housing Bank. Inflation in the late 1970s and until the mid-1980s had a fundamental fiscal source, turned inertial by the indexing of the money base which continued to provide the seigniorage required to fund the fiscal gap. The various heterodox programs of the 1980s and 1990s failed not because they lacked ingenious monetary programs but because the ultimately lacked a fiscal anchor. The floating exchange rate of 1999 was not a choice but an imposition given the incompatibility of the fixed rate with fiscal expansion post the Real Plan.

Armando Castelar notes,[37]

> *Independentemente da visão que se adote, a disfuncionalidade do Estado brasileiro aparece como o principal obstáculo à aceleração do desenvolvimento do Brasil. O Estado brasileiro é disfuncional em várias dimensões. Sua política macroeconômica é ineficiente, pois pisa no acelerador com uma política fiscal expansionista, enquanto usa o freio de mão da política monetária para segurar a demanda do setor privado, provocando uma desnecessária apreciação do câmbio. Ele gasta e tributa muito, uma tributação instável e regressiva, que fomenta a informalidade e o desvio de recursos escassos para a administração e o planejamento tributários. Apesar de gastar muito, investe pouco, comprometendo a qualidade da infra-estrutura, já que também não cria condições regulatórias adequadas para que o setor privado invista um volume suficiente de recursos no setor. É um Estado ineficiente na provisão de serviços públicos, levando o país a conviver com indicadores ruins de saúde, educação e segurança públicas, a despeito do elevado gasto nessas áreas. Finalmente, mas não menos importante, falha em não prover um nível adequado de segurança jurídica, desestimulando o investimento e o crescimento da produtividade.*

[36] R. Bonelli and S. Pessôa, "Desindustrialização no Brasil: Um Resumo da Evidência." Rio de Janeiro: FGV/IBRE, Texto para Discussão No 7, Mar. 2010

[37] A. Castelar, "O Brasil Precisa de uma Estratégia de Desenvolvimento?" in, J. Sicsú and A. Castelar:"Sociedade e Economia: estratégias de crescimento e desenvolvimento." Brasília, Ipea, 2009, p. 15.

Looking forward and eschewing the pitfalls of misplaced developmentalism many things could be done—provided Brazil is capable of building a basic framework of political support for constructive policy action. This is not a given, least of all in the current interregnum of an unpopular lame-duck president barely into the first year of her mandate pursuing an incomplete but just-sufficient fiscal adjustment to avoid the downgrade in country ratings. It is not clear which path she wants to take and even less clear which path the congressional leadership will allow her to take. The fragmentation of political forces is behind this uncertainty. There are 28 political parties in Congress and the largest plurality (the PT) holds only 14% of the chairs in the Lower House. Fragmentation weakens the role of leaderships, be it the president, congressional leaders or even party-specific leaderships; it creates a "presidentialism of coalitions" fueled by costly fiscal cooptation, patronage and at least partly by corruption, with minimal support for policy. Surely, one thing that has been learned from the last three decades of research on institutions, political processes and growth is that few societies have been capable of building sustainable political systems and sets of institutions that are endogenously supportive of growth—Brazil may not be one of the few.[38]

That said if policies are what is needed a powerful agenda has been built up over the last few years centered on the work of Edmar Bacha, Regis Bonelli, Armando Castelar and the group of scholars now working in the Growth & Development Center at FGV.[39] In a seminal paper first circulated in 2010 and including results from a decade of related work, Bacha and Bonelli showed that the growth problem was not only a lack of domestic savings and investment, though this was—and is, to be sure, a problem especially given that after taxing nearly 40% of GDP, and spending nearly half of it, the public sector

[38] Acemoglu, D. and J. Robinson: *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. Crown Publishers, 2012.

[39] The theme, however, is not new. See, for example, A. Castelar, I. Gill, L. Servén and M. Thomas, "Brazilian Economic Growth, 1900-2000: Lessons and Policy Implications." World Bank, Dec. 2001; or the more policy-focused, M. Lisboa (ed.) "Política Econômica e Reformas Estruturais" Brasília: Ministério da Fazenda, Apr. 2003 (http://www.fedepsp.org.br/superior/politica_econ_ref_estrut.pdf); P. Levy and R. Villela (eds.) "Uma Agenda Para o Crescimento e a Redução da Pobreza." Rio de Janeiro, Ipea, Texto para Discussão No 1234, Nov. 2006 (http://www.ipea.gov.br/portal/images/stories/PDFs/TDs/td_1234.pdf)

invests less than 2% of GDP. Contributing to the lackluster post 1970's performance were (a) a perverse trend, against the international norm, of systematic increases in the relative price of capital goods due to protectionism and the cost of import substitution of capital goods; (b) a wasteful pattern for industries operating with large margins of underutilized capacity due mainly to lack of competition; (c) excessive capital deepening, likely due to the subsidies on capital; (d) abysmal productivity with very low growth in TFP.[40] In short, the country invests little and chooses poorly how and where to invest; pays more than it should for the investment and uses it wastefully. The outcome is low productivity and low potential growth diminished by the severity of recent cycles.

The conclusion of a number of recent studies is clear and sobering: The main fault is low productivity and within it low efficiency. Low rates of investment matter but what really damages the outlook for growth is the bad use of the investment, its low rate of return and, in particular, low TFP. A recent decomposition of trends in the period 1980-2009 shows that with the average growth rate of negative0.5%pa, TFP growth was -3.1%pa notwithstanding the fact that human capital accumulation increased at 2.1%pa (and capital per worker, 0.4%pa).[41] This low efficiency is the result mainly of barriers to international trade; bad and excessive regulation; high and distorted taxes and levies; scarce infrastructure of poor quality and maintenance built and operated within a distorted regulatory environment; barriers to technological innovation and diffusion; a very poor environment for doing business including pervasive problems with the enforcement of property rights and access to impartial and timely justice, and last but not least the poor quality of education.[42] Certainly what could be done

[40] R. Bonelli and E. Bacha, "Crescimento brasileiro revisitado." Texto para Discussão nº 22. Rio de Janeiro:IEPE/CdG. Nov. 2011. (http://iepecdg.com.br/uploads/texto/TD%20IBRE%20-%20CRESCIMENTO%20BRASILEIRO%20REVISITADOx.pdf). See also, Edmar Bacha and Regis Bonelli, " Uma interpretação das causas da desaceleração econômica do Brasil," *Revista de Economia Política*, vol. 25, nº 3 (99), pp. 163-189, Sep/2005.
[41] P. Ferreira and F. Veloso, " O Desenvolvimento Econômico Brasileiro no Pós-Guerra," Rio de Janeiro, FGV, 2013, Table 2, p.13. (http://crescimento.fgv.br/sites/crescimento.fgv.br/files/desenvolvimentobrasil.pdf)
[42] P. Cavalcanti: "O Futuro da Economia Brasileira: baixa eficiência e baixo crescimento?" Rio de Janeiro: FGV, Apr. 2015. (http://crescimento.fgv.br/sites/crescimento.fgv.br/files/ferreirafgv_cres_des.pdf)

more immediately are changes in the structure of taxation; in the labor regime and generally, in reducing the so-called "Brazil cost"[43] and in increasing competitiveness.[44] The focus is not industry alone. Brazil today is a services economy and although lately the growth in productivity in services is faster than in industry, it is still too low. And it turns out that here again the main issue is very low levels of schooling and training, penalized further by the punitive business environment.[45]

Yet perhaps, in such a complex polity, the feasible way would be to set the course around a central theme. If there is one such central theme today, it surely would be openness (much as, at the start of Lula's first administration, it was the need to eradicate poverty)—a theme dear to Professor

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[43] Loosely speaking the term refers to the additional cost of doing business in Brazil vis-à-vis a comparable international benchmark accruing from disadvantages in taxation (level, incidence and complexity including costs of compliance), financing (level of interest rate and ease of access to credit), cost and access to energy and basic supplies, infrastructure and logistics, coping with the regulatory bureaucracy, cost and access to non-tradable public services. See, for example, FIESP: "Custo Brasil e taxa de câmbio na competitividade da indústria de transformação brasileira conforme intensidade tecnológica." Departamento de Competitividade e Tecnologia, June, 2013. (http://www.fiesp.com.br/arquivo-download/?id=56679) The study concludes, "O Custo Brasil independe de estratégias das empresas, pois decorre de deficiências em fatores sistêmicos, as quais somente podem ser dirimidas com políticas de Estado.", P.12. Thus it calls for public action on fundamental microeconomic reforms. And the cost disadvantage can be relevant. This study estimates that the added cost can vary from 20.8% to 28.7% depending on the "group of technological intensity." ABIMAQ (Associação Brasileira da Indústria de Máquinas e Equipamentos) estimates that the "Custo Brasil" in 2012 was 37% vis-à-vis Germany and the US. ABIMAQ: "Custo Brasil 2002-2012", Departamento de Competitividade, Economia e Estatítisca, August 2013. (http://www.abimaq.org.br/Arquivos/Html/DEEE/130715%20-%20Custo%20Brasil%20(III).pdf) In a similar vein, it is well-know that Brazil ranks poorly in the World Bank's Cost of Doing Business Index, ranking in the 120th position (of 189) at last count; just below Nicaragua and barely above Cabo Verde. Nevertheless, the argument is also used to reinforce claims for protectionism—and the São Paulo Federation of Industries (FIESP) is notorious for its protectionist tendencies. As Samuel Pessôa argues,

> "*Há diversos analistas que se preocupam coma perda do peso das manufaturas nas exportações brasileiras. Para combater essa tendência e elevar a competitividade da indústria brasileira recorrentemente são sugeridas medidas para elevar a eficiência da economia ou reduzir o Custo Brasil. Infelizmente, em geral essas medidas não concorrem para estimular a indústria. O erro desta analise é achar que o competidor do produtor de manufaturas no Brasil é o produtor de manufaturas do resto do mundo. O competidor do produtor de manufaturas no Brasil é o produtor de bens primários no Brasil. Se o Brasil não produzisse bens primários, o câmbio seria o necessário para haver um superavit externo nas exportações de bens manufaturados*."

"Aspectos teóricos e desempenho recente: conta-corrente do balanço de pagamentos e competitividade" p. 72. In: R. Bonelli (ed.): *A Agenda de Competitividade do Brasil*. Rio de Janeiro: FGV/IBRE 2011.

[44] See Bonelli (op.cit.) for a discussion esp. Part II: "As políticas públicas e a agenda de competitividade" pp.70-266.

[45] F. Veloso: "Desafios para o Crescimento Econômico." Rio de Janeiro: FGV/IBRE, Apr. 2015. (http://crescimento.fgv.br/sites/crescimento.fgv.br/files/veloso_produtividade.pdf)

Albert Fishlow.[46] What is wanted is openness to foreign and domestic competition, a gradual breakdown of the many barriers and associated privileges granted by the state that thousands of groups have cultivated; from oligopolistic producers and distributors hiding behind national content rules and barriers to domestic trade; to students with access to free public universities (regardless of family income) and half-fares in public transit; to retirees with their half-price tickets to movie houses.[47]

The future lies in finding ways to increase efficiency, and the woefully low productivity of labor. Overall investment is low, but its efficiency is even lower, mainly because of the "way things are combined and put together" and "the environment supporting investment and output" are not right. Recent studies have shown that the productivity of a Brazilian worker is 20% that of a US worker; and 50 - 70% of that difference is explained by lower total factor productivity, not the lower level of capital per output.[48] This must and can change but only if the necessary macro adjustment is complemented by deep microeconomic reforms.

[46] Edmar Bacha has argued persuasively for this change. See for example his interview at *O Estado de São Paulo*, March 15, 2014. See also, Edmar Bacha: "Integrar para Crescer: O Brasil na Economia Mundial." Rio de Janeiro: Instituto de Estudos de Política Econômica/Casa das Garças, Dec. 2013.

[47] In a provocative and insightful analysis of the Brazilian experience, Marcos Lisboa and Zeina Latif ("Democracy and Growth in Brazil," Insper Working Paper WPE: 311/2013, April 2013. (http://www.insper.edu.br/working-papers/working-papers-2013/democracy-and-growth-in-brazil/) observe that: "Since [the] colonial period, Brazil has experienced many political cycles. Yet throughout this long period, rent-seeking mechanisms were not only preserved but also enhanced. They were accepted as essential to the country's development project. The purpose of government, many believed, was to provide protection, incentives and benefits to selected sectors in order to Promote growth." Pp. 10-11. They also note that: "Rent-seeking in Brazil manifests itself in several ways... First, there is a very complex system of tax and transfers, characterized by several rules and exemptions that mask the beneficiaries of privileges. Second, there are mandatory tax-transfer mechanisms that do not go through government budgets. Third, several cross-subsidies, via price control and forced allocations of funds, provide specific benefits under hidden mechanisms. Fourth, trade and non-trade barriers limit competition." P. 23.

[48] Pedro C. Ferreira " Por que a produtividade do trabalhador brasileiro é tão baixa?" in Folha de São Paulo, January 25, 2015; for a fuller discussion, "Education Policies and Structural Transformation" with A. Moge-Naranjo and L. Pereira, St. Louis: Federal Reserve Bank of St. Louis, Working Paper 2014-039A. (https://research.stlouisfed.org/wp/2014/2014-039.pdf).

Data Appendix and a comment on the "price puzzle"

Variable definitions:

- The policy variable is the Selic target rate set by the COPOM
- Inflation gap-1st subsample (2003:01-2008:12): the difference between the median of the 12mo forward inflation expectations collected by the central bank survey and the 12mo forward inflation target determined by the National Monetary Council.
- Inflation gap-2nd subsample (2009:06-2014:07): the difference between the current month's IPCA inflation year-on-year and 6.5% (the ceiling of the target corridor during this period).
- Output gap: Produced by applying a Baxter-King frequency filter with 12 lags and a band bounded by P_L = 18.0 and P_U = 96.0 to the 12mo moving average of the quarterly GDP series seasonally adjusted (1995=100) produced by IBGE.
- Commodity price cycle: Produced by applying a Baxter-King frequency filter with 18 lags and a band bounded by PL = 18.0 and PU = 96.0 to the 12mo moving average of the CRB index.
- World trade cycle: Produced by applying a Baxter-King frequency filter with 18 lags and a band bounded by PL = 18.0 and PU = 96.0 to the 12mo moving average of the Netherlands Bureau for Economic Policy Analysis total global trade index.
- Fed funds rate: the US Fed's federal funds target rate

Table 1: Canonical model - Bayesian VAR Estimates (Prior type: Litterman/Minnesota; Initial residual covariance: Univariate AR) – *t-statistics in italics*

	Sample: 2003M01 2008M12 Included observations: 72			Sample: 2009M06 2014M07 Included observations: 62		
	SELIC	IGAP	GDP_BK2	SELIC	IGAP3	GDP_BK2
SELIC(-1)	0.870	0.014	-0.020	0.869	-0.012	-0.003
	37.699	*0.789*	*-28.659*	*27.318*	*-0.563*	*-2.315*
SELIC(-2)	0.008	0.000	-0.001	0.011	-0.001	-0.001
	0.645	*0.049*	*-2.268*	*0.893*	*-0.104*	*-2.161*
SELIC(-3)	0.000	0.000	0.000	0.001	0.000	0.000
	0.029	*-0.009*	*-1.140*	*0.172*	*-0.048*	*-1.278*
IGAP(-1)	0.310	0.766	0.037	0.008	0.763	0.009
	6.099	*20.140*	*24.603*	*0.133*	*18.337*	*3.661*
IGAP(-2)	0.006	0.009	0.001	-0.002	0.003	-0.001
	0.393	*0.733*	*1.562*	*-0.109*	*0.216*	*-1.382*
IGAP(-3)	0.001	0.000	0.000	0.000	0.000	0.000
	0.164	*0.131*	*0.650*	*-0.076*	*-0.099*	*-0.829*
GDP_BK2(-1)	0.508	0.593	1.343	0.790	0.336	1.583
	1.519	*2.379*	*133.964*	*4.363*	*2.853*	*237.281*
GDP_BK2(-2)	-0.297	-0.516	-0.322	-0.583	-0.175	-0.529
	-0.867	*-2.017*	*-31.212*	*-2.673*	*-1.234*	*-65.586*
GDP_BK2(-3)	-0.057	-0.080	-0.052	-0.093	-0.014	-0.094
	-0.488	*-0.921*	*-14.881*	*-1.042*	*-0.234*	*-28.433*
C	1.600	-0.174	0.322	1.159	-0.056	0.059
	5.447	*-0.794*	*36.638*	*3.978*	*-0.298*	*5.535*
R-squared	0.991	0.957	0.996	0.958	0.911	0.998
Adj. R-squared	0.990	0.950	0.995	0.951	0.896	0.998

Table 2: Extended model - Bayesian VAR Estimates (Prior type: Litterman/Minnesota; Initial residual covariance: Univariate AR) – *t-statistics in italics*

	Sample: 2003M01 2008M12 Included observations: 72			Sample: 2009M06 2014M07 Included observations: 62		
	SELIC	IGAP	GDP_BK2	SELIC	IGAP3	GDP_BK2
SELIC(-1)	0.725	0.005	-0.005	0.692	-0.016	0.010
	22.056	*0.211*	*-5.805*	*11.883*	*-0.445*	*4.554*
SELIC(-2)	0.009	-0.002	-0.001	0.140	-0.025	-0.001
	0.764	*-0.180*	*-2.060*	*3.101*	*-0.891*	*-0.802*
SELIC(-3)	0.000	0.000	0.000	0.048	-0.018	-0.002
	0.133	*-0.162*	*-1.185*	*1.520*	*-0.914*	*-1.684*
IGAP(-1)	0.379	0.717	0.038	0.057	0.659	0.026
	6.898	*18.503*	*25.521*	*0.556*	*10.149*	*7.008*
IGAP(-2)	0.010	0.009	0.001	-0.019	0.011	0.003
	0.597	*0.762*	*1.387*	*-0.262*	*0.240*	*1.005*
IGAP(-3)	0.002	0.000	0.000	-0.031	-0.046	-0.001
	0.317	*0.079*	*0.329*	*-0.639*	*-1.480*	*-0.359*
GDP_BK2(-1)	1.832	0.512	1.196	1.562	0.579	1.458
	4.293	*1.704*	*103.488*	*2.539*	*1.480*	*64.563*
GDP_BK2(-2)	-0.706	-0.520	-0.230	-1.004	-0.783	-0.237
	-1.791	*-1.874*	*-21.521*	*-0.946*	*-1.160*	*-6.069*
GDP_BK2(-3)	-0.119	-0.085	-0.039	-0.077	0.370	-0.284
	-0.918	*-0.926*	*-11.169*	*-0.148*	*1.127*	*-14.997*
C	4.558	0.425	-0.061	1.045	0.315	0.062
	7.285	*0.965*	*-3.619*	*2.718*	*1.290*	*4.422*
WTRADE_BK2	-0.336	0.039	-0.074	-0.157	-0.030	-0.001
	-3.068	*0.500*	*-25.087*	*-2.276*	*-0.677*	*-0.203*
FED12	-0.142	-0.135	0.046	0.024	-0.103	-0.319
	-2.248	*-3.029*	*26.879*	*0.033*	*-0.223*	*-12.136*
CRB_BK2	-0.045	0.002	0.016	-0.003	0.013	-0.001
	-2.775	*0.191*	*36.676*	*-0.362*	*2.349*	*-4.016*
R-squared	0.994	0.967	0.998	0.963	0.915	1.000
Adj. R-squared	0.993	0.961	0.997	0.954	0.894	1.000

The "price puzzle": As seen in Appendix Figures A1 and A2 below, the estimated reaction functions for the COPOM produce the expected "price puzzle" common to the literature employing structural VARs to estimate monetary policy reaction functions.

The puzzle arises because, disconcertingly, a shock to the interest rate has the effect of increasing inflation, or in our case of causing the inflation gap to increase. Looking at the first subsample, the inclusion of the external variables reduces, as expected, the extent of the puzzle: The inflation gap turns negative by the 6th month and remains negative or zero from there on. One of the external variables is a measure of commodity prices—and in results for the Fed, "conventional wisdom maintains that commodity prices resolve the price puzzle because they contain information that helps the Fed forecast inflation."[49] The idea being that the puzzle arises because the monetary authority can better anticipate deviations in the inflation gap and act accordingly. It responds systematically to expectations of higher future inflation but, in the case of commodity price shocks, not by enough to actually prevent inflation from rising. The policy response aims to stabilize the propagation of the shock, or its secondary effects, and stops short of reversing its immediate impact on the price level.[50]

More generally, the price puzzle arises because the estimated reaction function is, likely, incomplete or has periods of indeterminacy. Nevertheless, research has shown that periods of indeterminacy do not compromise the usual effect of hikes in rates leading to lower inflation as long as the reaction function shows a strong response of the policy rate to innovations in inflation, as is the case with our estimates.[51]

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[49] M. Hanson, "The 'Price Puzzle' Reconsidered," *Journal of Monetary Economics*, Vol. 51, October 2004, p. 1385.
[50] The standard reference and first note about the price puzzle is C. Sims, "Interpreting the Macroeconomic Time Series Facts: The Effects of Monetary Policy," *European Economic Review*, Vol. 36, June 1992.
[51] "Importantly for the price puzzle, the model estimates imply that in this period of indeterminacy [when there is no way to identify the exact sources of forecast errors], inflation would rise immediately and in a sustained fashion in response to an interest hike. Reassuringly for monetary policymakers, the model estimates for both determinacy periods—before 1972 and after 1981—suggest that increases in the federal funds rate unambiguously help rein in inflation." Belaygorod, A. and M. Dueker, "Timing Transitions Between Determinate and Indeterminate Equilibria in DSGE Models," Working Paper 2006-025, Federal Reserve Bank of St. Louis, October 2006.

Figure A1. Canonical model (Endogenous: Selic, inflation and output gaps): Response of IGAP to Selic

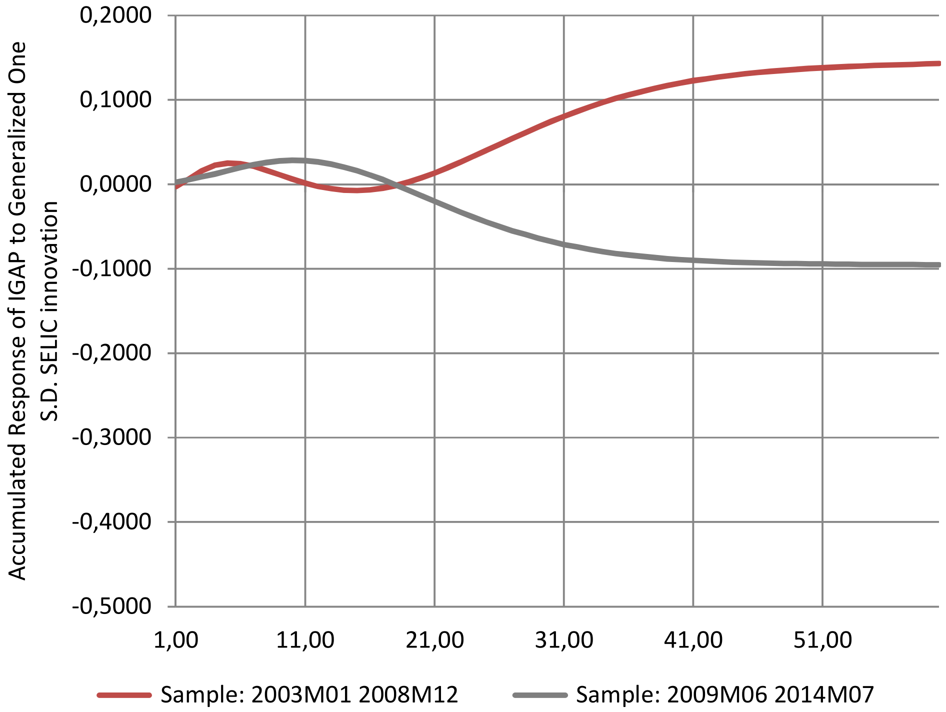

Figure A2. Extended model (Endogenous: Selic, inflation and output gaps; Exogenous: Commodity prices and World trade gaps, Fed funds rate): Response of IGAP to Selic