

Brazil—Economic Activity**Deterioration in the Labor Market:****Rodolfo Margato***

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The Worst Consequence of the Economic Downturn

- **All labor market variables have been deteriorating significantly, in-line with the deepening recession. In our view, the negative performance of these indicators will continue until 1H17, as economic activity should stabilize only at the end of this year.**
- **There are significant methodological differences among the available labor market surveys. We present the main limitations of these data sources and offer some estimates in order to improve the accuracy and completeness of the labor market analysis.**
- **We estimated the historical data series of the main labor market variables published by PNAD, considering the period from January 2002 to February 2012: (i) employed population; (ii) labor force; (iii) unemployment rate; (iv) average real wage; and (v) aggregate real wages. The official statistical (observed data series) results of PNAD are only from March 2012 onward.**
- **Despite the methodological discrepancies, all surveys have been showing a widespread worsening in the domestic employment level, which is not likely to be interrupted this year, in our opinion. In turn, we believe the shrinkage of household income will keep the labor force on an upward path.**
- **We forecast that the national unemployment rate published by PNAD will climb from 9.9% in 2015 to 12.8% in 2016 (end of period, seasonally adjusted), peaking only in mid-1H17 at 13.6%, which would mean the highest level of the historical data series.**
- **One of the most severe consequences of the recessionary outlook has been the increase in employment informality. Due to the poor financial conditions of companies and the uncertain macro environment, we believe the informality will continue to increase over the next two years, at least.**
- **According to our estimates for the aggregate real wages with social benefits (Social Security and Social Protection benefits), which functions as a proxy for the household income, we reiterate our expectation that private consumption will not resume growth in 2016, weighing heavily on GDP dynamics.**



Different Measures for Labor Market Indicators

Labor market indicators have been showing a deep and widespread deterioration. The worst recession in many years has led to a rapid increase in the unemployment rate, a steep decline in real wages, and increase in employment informality, among other dismal effects. Looking ahead, we think the negative path of these indicators will not be reversed until 1H17, as economic activity should stabilize only at the end of this year, in our view. According to our econometric estimates, the main variables of the labor market react with an average lag of about six months with regard to economic activity indicators, notably GDP.

There has been a lot of evidence of the poor performance of the Brazilian labor market. Nevertheless, some methodological differences among the available surveys are noteworthy. Thus, we present in this study the main limitations of these surveys and offer some estimates in order to improve the accuracy and completeness of the labor market analysis.

The Monthly Employment Survey (PME) released by IBGE—Brazilian Institute of Geography and Statistics—had been for a long time the official source of labor market data in Brazil. However, PME’s historical data series, which began in 2002, covers only six metropolitan areas in the country (São Paulo, Rio de Janeiro, Salvador, Belo Horizonte, Recife, Porto Alegre), totaling 44,000 households in 145 municipalities. Because of this limitation, in January 2014 IBGE started publishing the Continuous National Household Sample Survey (Continuous PNAD, or simply PNAD). **PNAD data series cover the entire national territory, around 211,000 households in 3,500 municipalities, and it will provide the official statistics for the Brazilian labor market from April onward**, as PME was discontinued. The last publication of PME was March 22, with data for February. **Due to the sample survey design, PNAD indicators are available on a quarterly moving average basis.**

Note that some factors make PME and PNAD not directly comparable, such as their different concepts of employment/unemployment and questionnaires. For example, (i) PME includes as the working age population individuals aged over 10 years, while PNAD considers only individuals aged over 14 years; and (ii) for the PME sample, an unemployed person is anyone without a job, willing to participate in the labor market, and who had sought employment in the past 30 days, whereas for the PNAD sample a person without an occupation and willing to enter the labor market can already be considered unemployed. Indeed, the creation of PNAD corrected the weakness of PME of considering as inactive the worker who had given up looking for a job, but was still interested in returning to the labor market.

In short, PNAD can be considered more representative of the Brazilian labor market, in our view, especially due to its wider coverage and the use of more modern concepts aligned to international patterns. Nevertheless, **PNAD historical data series begin only in March 2012 (on a quarterly moving average, as mentioned), hindering the development of long-term analysis and forecasts.** Thus, we decided to estimate the data series of some PNAD variables backward through econometric methods.

In this report, we present our own estimates for the main labor market variables published by PNAD, considering the period from January 2002 to February 2012: (i) employed population; (ii) labor force; (iii) unemployment rate; (iv) average real wage; and (v) aggregate real wages. For the development of our methodological framework, we took into account the information contained in other Brazilian labor market surveys with longer historical data series.

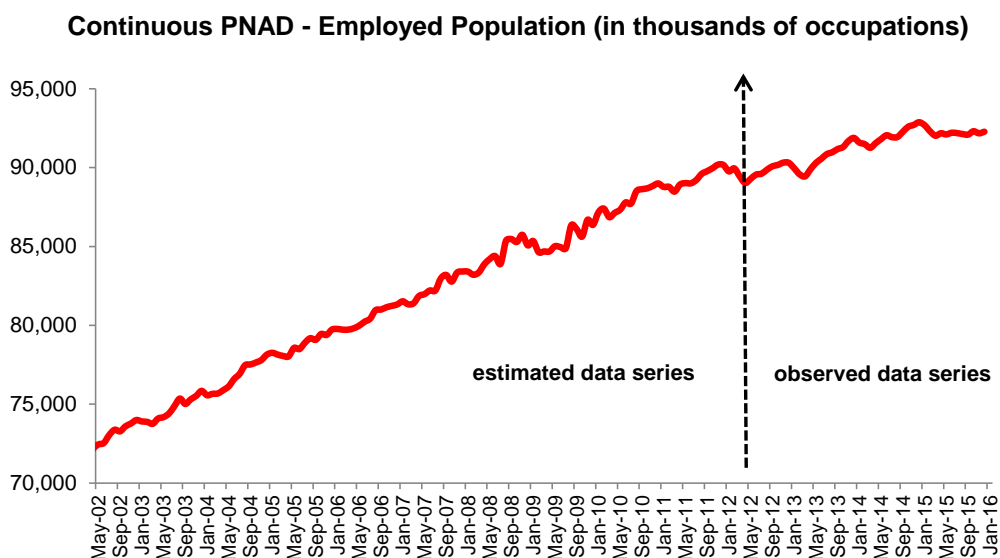
These surveys are: (1) Labor Ministry General Register for Employed and Unemployed (**CAGED**) that publishes monthly data on the net creation of jobs in the formal labor market—entire national territory; (2) SEADE/DIEESE’s Employment and Unemployment Report (**PED**) that releases monthly data for six metropolitan regions in Brazil—São Paulo, Salvador, Recife, Porto Alegre, Fortaleza, Distrito Federal; (3) IBGE’s Monthly Employment Survey (**PME**), as described above; and (4) Annual National Household Sample Survey (**Annual PNAD**) that provides only annual data for the Brazilian labor market, covering around 1,100 municipalities. For the latter, it should be noted that the reference period of data collection is the last week of September, and so its information becomes relevant only to the long-term dynamics of our estimates for PNAD indicators. Annual PNAD data are useful for the comparison with the PNAD estimates’ annual growth rate, whereas the other three data sources bring important contributions to short-term variations.



Continuous PNAD: Expanding the Analysis Period

In order to estimate the historical data series of PNAD's employed population, we regressed its cyclical component¹ against the cyclical component of the PME, CAGED, and PED employed population time series, considering the period ranging from March 2012 to December 2015. After normalizing the coefficient estimates of this multiple regression, we calculated the PNAD employed population for the period from January 2002 to February 2012 (standardized weights of the explanatory variables multiplied by their respective observed time series at such period). Besides this econometric method, we compared the long-term behavior of the estimated series with the annual PNAD data series in order to validate the results. Despite the known methodological differences, the comparison did not disqualify our analysis. The standardized weights (sum equal to 1) and the dynamics of the estimated PNAD employed population are shown in Appendix 1.

Looking at the employed population data series, we highlight the significant increase of the employment level in CAGED data series from 2004 to 2013, which reflects the strong expansion in the formalization of the Brazilian labor market in the period. CAGED report covers only formal jobs, while the other surveys also include the informality. Furthermore, note that the PNAD data series has shown a less pronounced deterioration in the recent period, compared with the other three data sources, possibly due to: (i) the higher resilience in regions that are not in major metropolitan areas and to (ii) the increase of the "self-employed" category (relevant for the comparison with CAGED data). **Despite these differences, we emphasize that all surveys have been showing a widespread worsening in the domestic employment level, which is not likely to be interrupted this year, in our opinion.**

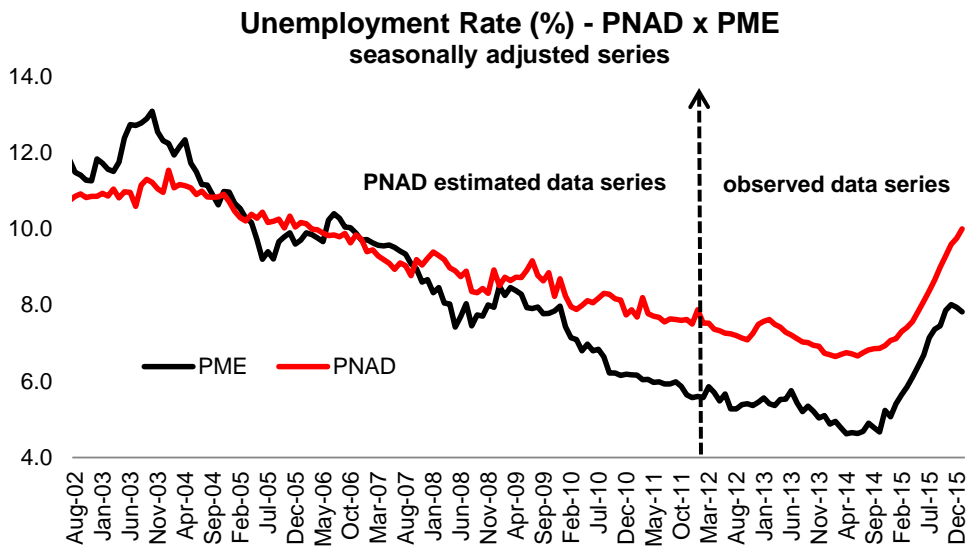


Source: IBGE, SEADE/DIEESE, MTE and Santander estimates

Similarly, we estimated the PNAD labor force with the information contained in PME and PED data series. (See Appendix 1.) In this case, we note the continued increase of the PNAD labor force in recent years, which contrasts significantly with the other labor market surveys. For example, PME data registered a fall of 0.7% in 2014 and an increase of only 0.6% in 2015, while PNAD results posted an expansion of 1.1% and 1.9% in the same periods, respectively. As mentioned, PNAD methodology considers as active the worker who has given up looking for a job, but is still interested in returning to the labor market (unlike the PME methodology), largely explaining these discrepancies. **In our view, the shrinkage of household income will keep the labor force on an upward path in the coming years.**

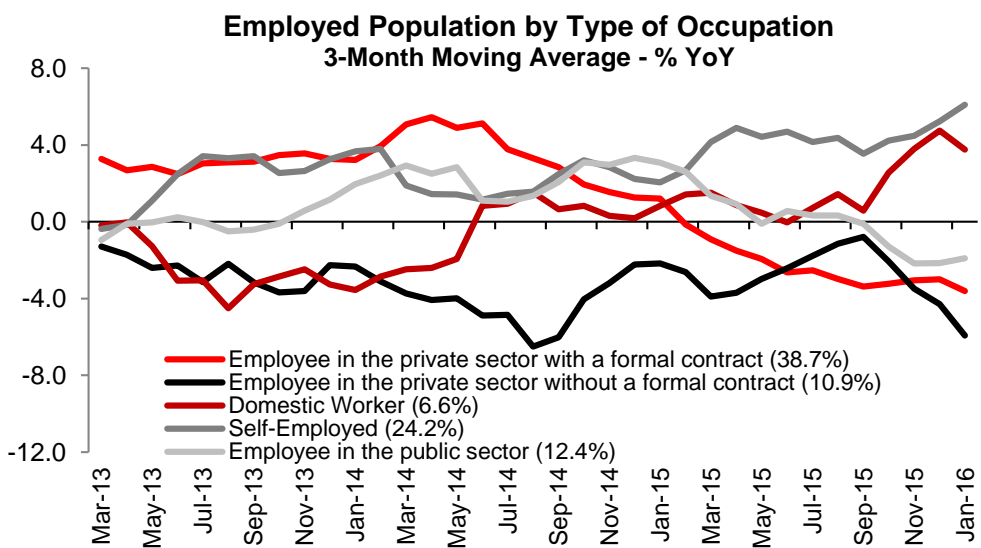
Based on our own estimates for the employed population and labor force, we calculated the PNAD national unemployment rate for the period from March 2002 to February 2012. According to our results, the current level of unemployed people is the highest since late 2006. The following figure shows the significant increase in the unemployment rate since mid-2014, as registered by both PME and PNAD data series. Despite the difference in levels, the dynamics presented by these surveys are quite similar. **Looking ahead, we forecast the national unemployment rate will climb from 9.9% in 2015 to 12.8% in 2016 (end of period, seasonally adjusted), peaking only in mid-1H17 at 13.6%, which would mean the highest level of the PNAD historical data series.**

¹ We adopted the Hodrick-Prescott filter (HP filter) to remove the cyclical component of the labor market time series from raw data.



Source: IBGE and Santander estimates

The deterioration in labor market conditions has been heavily affecting all regions and sectors in the Brazilian economy. With this, one of the most severe consequences of the recessionary outlook has been the increase in employment informality. Indeed, labor informality has grown considerably since last year. Regarding the occupation breakdown, the categories of “self-employed” and “domestic worker,” which account for around 30% of total employed population, had strong growth in 2015, whereas the category of “employee in the private sector with a formal contract,” which accounts for nearly 40% of total occupations, registered a sharp decline in the period. **Due to the poor financial conditions of companies and a macro environment full of uncertainties, we believe informality will continue to increase over the next two years.**



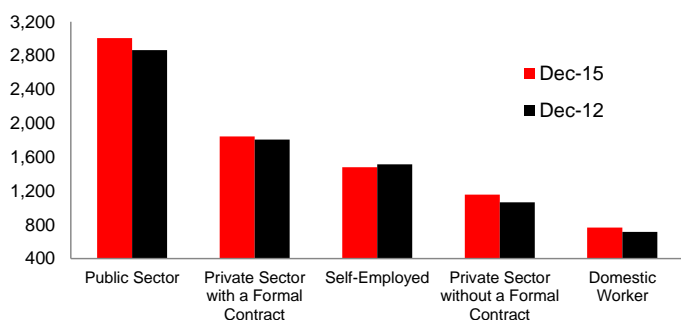
Source: National Household Sample Survey - PNAD / IBGE

Note: Relative weights are given in parenthesis (other smaller categories were not considered)

The rising informality has been contributing to a decline in the average real wage in the Brazilian labor market, as the groups of informal jobs have lower earnings than the groups comprising employees with a formal contract. Moreover, the wages of hired workers in the formal labor market have been falling substantially, while the average wages of dismissed workers continue to grow.

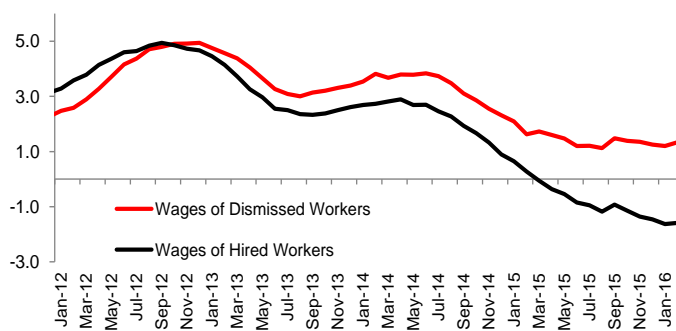


Average Real Earning by Type of Occupation (BRL)



Source: National Household Sample Survey - PNAD / IBGE

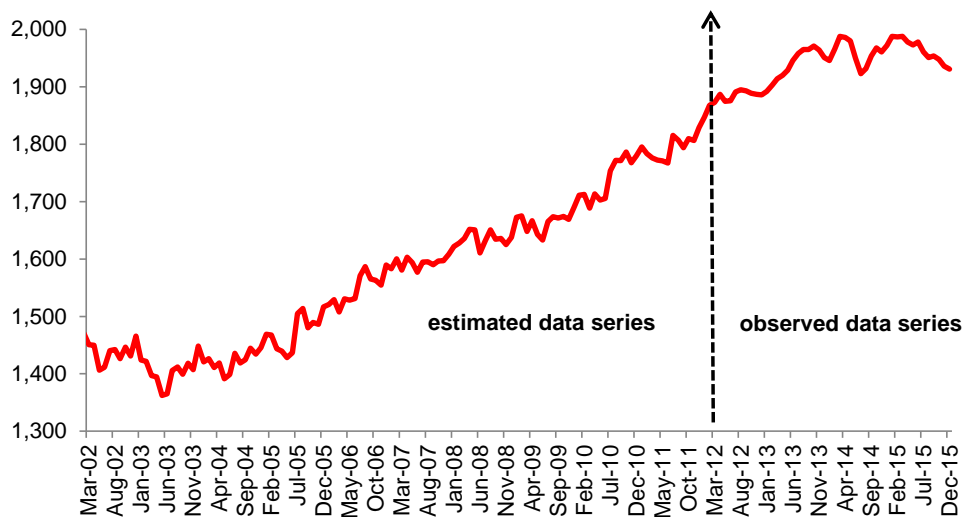
Wages of Hired Workers x Wages of Dismissed Workers % 12-Month Accumulated



Source: CAGED - Ministry of Employment and Labor

We also estimated the historical data series for the PNAD average real wage from 2002 to early 2012. As in the case of the employed population and labor force, we developed a multiple regression with the cyclical components of the available labor market surveys: PME, CAGED, and PED. The first two data sources showed the largest relative contributions to the short-term dynamics, according to our calculations. (See Appendix 1.)

Continuous PNAD - Average Real Wage (BRL)



Source: IBGE, SEADE/DIEESE, MTE and Santander estimates

As published by PNAD, the average real wage grew only 0.2% in 2015, decelerating from 1.1% in 2014 and 3.1% in 2013, and, based on our estimates, the average annual growth from 2004 to 2012 was 3.3%. **In our view, real wages will continue to weaken until mid-2017, given the sharp net destruction of formal jobs and increased informality of employment. We forecast a 2.8% contraction in 2016, marking the first negative result since 2003.**

The dismal performance of the employment and wage indicators, combined with tighter credit conditions, high household debt, and lower levels of consumer confidence led private consumption into the negative territory last year. Focusing on the labor market, note the substantial retreat in aggregate real wages—employed population multiplied by the average real wage—in the recent period. The average growth of this indicator inched down to 0.5% in 2015 from 2.6% in 2014 and from 5.3% for the 2004-2013 period, according to our estimates.

In addition to aggregate real wages, other sources of income have an important role in explaining the dynamics of household consumption—namely, (i) Social Security benefits; (ii) unemployment insurance and salary bonuses; and (iii) Social Protection benefits. **Considering all these items—whose data are released by public institutions, such as the National Treasury—and our own estimates for PNAD indicators, we built a monthly historical time series for aggregate real wages with social benefits, which functions as a proxy for household income.**



$$ARWB = ARW + SSB + UNI + SPB$$

ARWB = aggregate real wages with social benefits

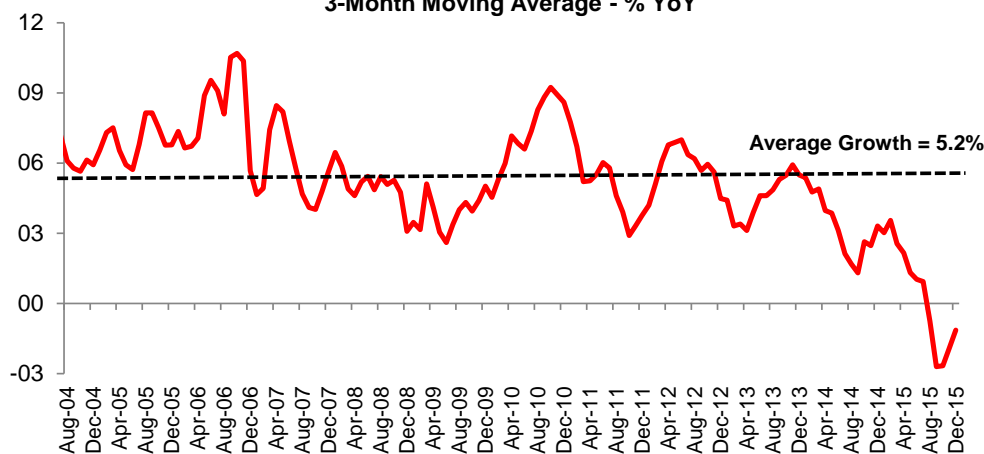
ARW = aggregate real wages (employed population * average real wage)

SSB = Social Security benefits

UNI = unemployment insurance and salary bonuses

SPB = Social Protection benefits

Aggregate Real Wages with Social Benefits
3-Month Moving Average - % YoY

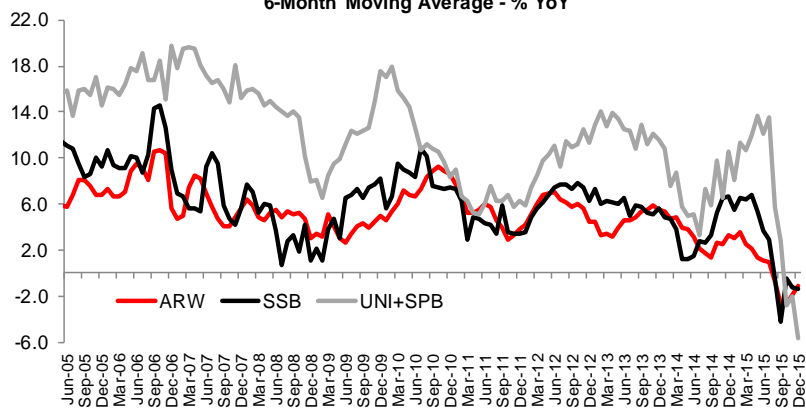


Source: Brazil Central Bank, IBGE, National Treasury, Ministry of Social Development and Santander estimates

According to our calculations, all the ARWB components had continued growth from 2003 to 2014, even during the 2008 global financial crisis. Moreover, we highlight that SSB and UNI+SPB weights have become increasingly larger over that period, especially the latter—the important contribution of the social program called “Bolsa Família”, for example—at the expense of the ARW weight.

Nevertheless, ARWB dynamics worsened significantly last year. Regarding its breakdown, all the components showed a decline in the recent period, in real terms; we used the National Consumer Price Index to deflate the nominal series. **In our view, the deep and prolonged recession combined with the sharp deterioration in public finances will keep real Social Security and Social Protection benefits on a downward trend in upcoming quarters.**

Aggregate Real Wages with Social Benefits by Component
6-Month Moving Average - % YoY



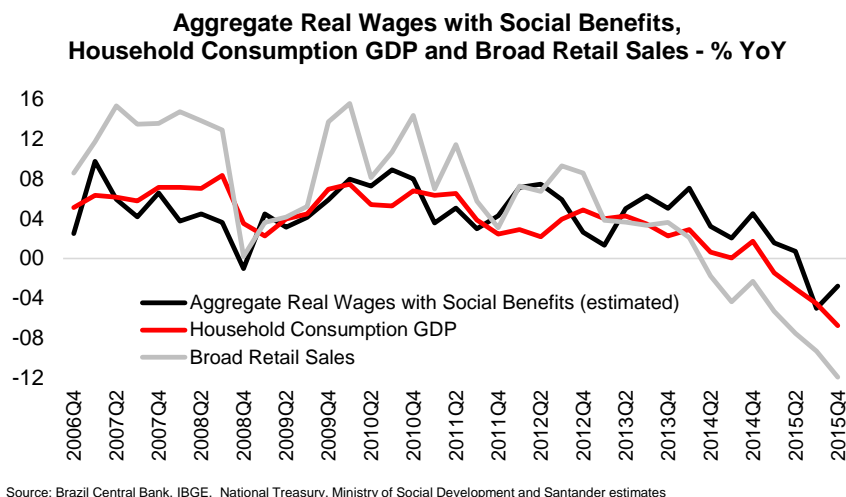
Source: Brazil Central Bank, IBGE, National Treasury, Ministry of Social Development and Santander estimates

Aggregate Real Wages with Social Benefits - Component Weights (%)			
Period	ARW	SSB	UNI+SPB
2003 - 2006	81.9	15.3	2.8
2007 - 2009	80.6	15.7	3.7
2010 - 2013	79.8	15.9	4.3
2014 - 2015	79.1	16.3	4.7

The negative outlook for aggregate real wages with social benefits supports our expectation that retail sales and household consumption will not resume growth in 2016. We see some stabilization of these variables only by the end of the year, mainly due to falling inflation and a slight improvement in consumer confidence. Therefore, we forecast that broad real retail sales will contract around 6% this year (-8.6% in the previous year), whereas we expect Household



Consumption GDP to decline nearly 3.5%, following a contraction of 4.0% in 2015. (Household Consumption GDP accounts for a little over 60% of total GDP.)



Labor Market Prognosis and Conclusions: It May Get Even Worse

As we present in this report, there are different sources of labor market data. In our view, the PNAD methodology brings significant improvement to the analysis of the topic, especially due to the national coverage and the wider definition of unemployment. Nevertheless, its short historical data series hinders the development of long-term analysis and forecasts, so we used econometric methods to estimate the main PNAD indicators for a longer period, ranging from 2002 to early 2012. (The observed results of PNAD are for the period 2012-15.)

We think that all labor market indicators will continue to deteriorate until next year. The widespread contraction of economic activity across sectors should lead to an additional net destruction of formal jobs in the period, in our opinion, with the retail and services sectors showing the most negative contributions. Combined with this, the labor force should remain on an upward trend, in our view, owing to the decline in household income. In other words, the Brazilian labor market scenario may get even worse, with the unemployment rate peaking only in mid-1H17, in our opinion.

Considering more disaggregated data, note that the shares of informal occupations have grown rapidly, as have job losses among heads of household, leading to negative effects on socioeconomic conditions, such as poorer qualification levels, falling productivity, and lower potential growth.

The table below summarizes our forecasts for the main labor market variables:

Forecasts for the Main Labor Market Indicators			
Indicator	2015	2016F	2017F
Net Creation of Formal Jobs - million jobs (CAGED)	-1.63	-1.44	0.23
Employed Population - million people	92.1	90.6	91.1
Employed Population - annual change (%)	0.0	-1.7	0.5
Labor Force - million people	100.7	102.8	104.1
Labor Force - annual change (%)	1.9	2.1	1.3
Unemployment Rate - annual average (%)	8.5	11.9	12.5
Unemployment Rate - end of period (%)*	9.9	12.8	13.3
Average Real Wage - BRL	1,963	1,908	1,889
Average Real Wage - annual change (%)	-0.2	-2.8	-1.0
Aggregate Real Wages - BRL million	175,2	167,3	166,7
Aggregate Real Wages - annual change (%)	0.0	-4.5	-0.5

Source: National Household Sample Survey (PNAD), CAGED and Santander forecasts

* seasonally adjusted series

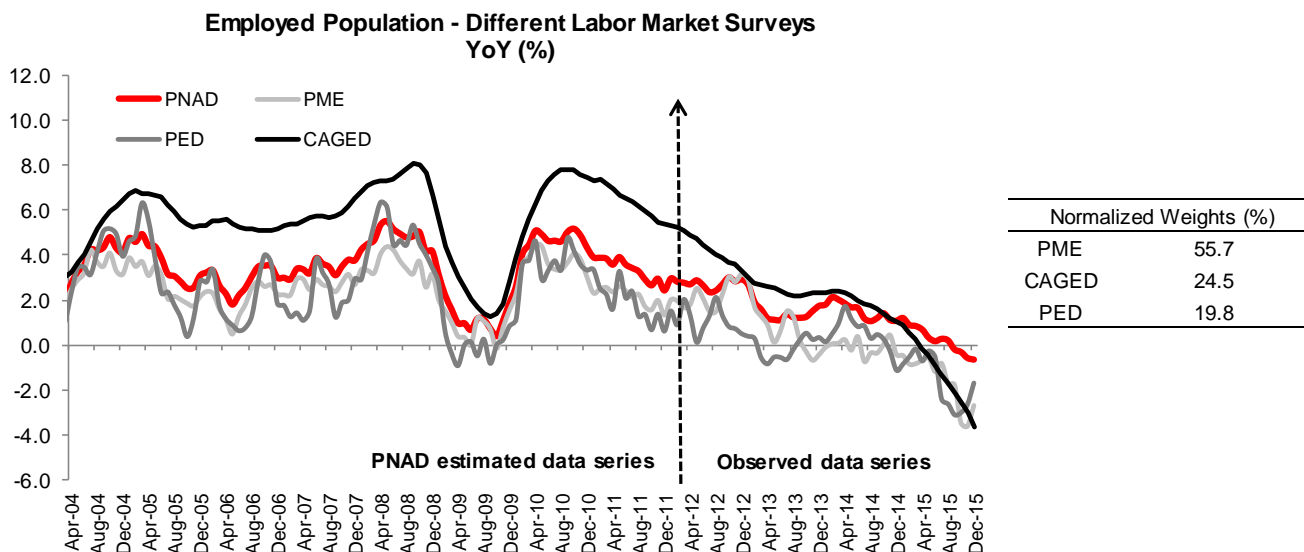


Appendix 1

Notes:

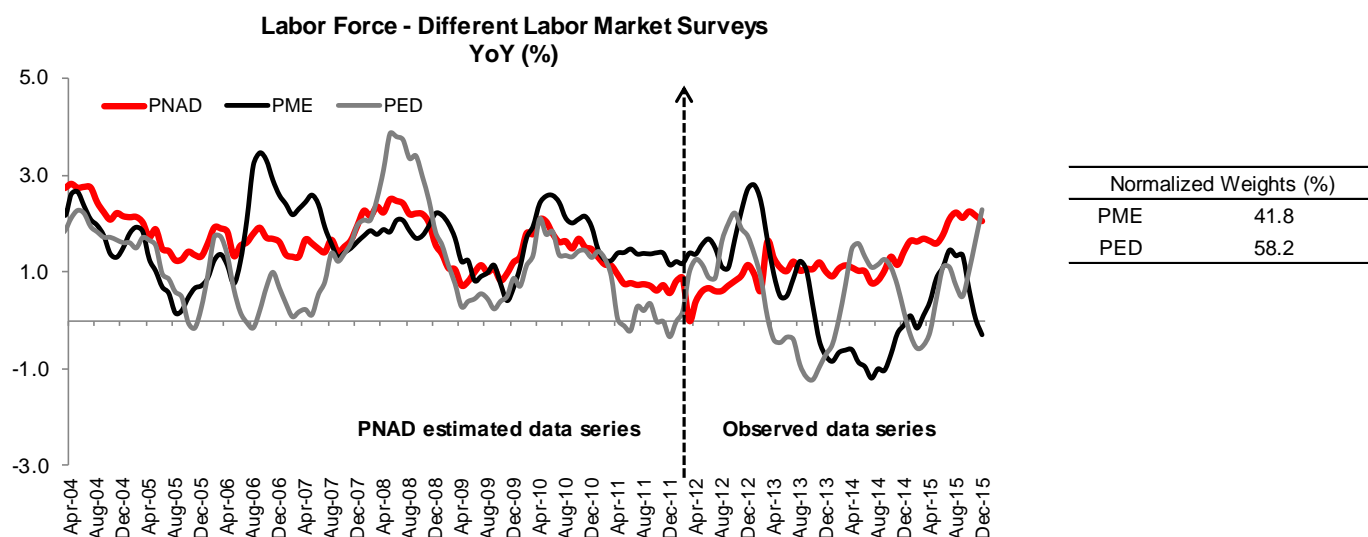
- (a) The normalized weights were calculated from the coefficient estimates of our econometric models.
- (b) From March 2012 backward, the charts present our own estimates for the PNAD data series.
- (c) Annual PNAD data were used to validate the long-term dynamics of the estimated data series.

I. PNAD Employed Population



Source: IBGE, SEADE/DIEESE, MTE and Santander estimates

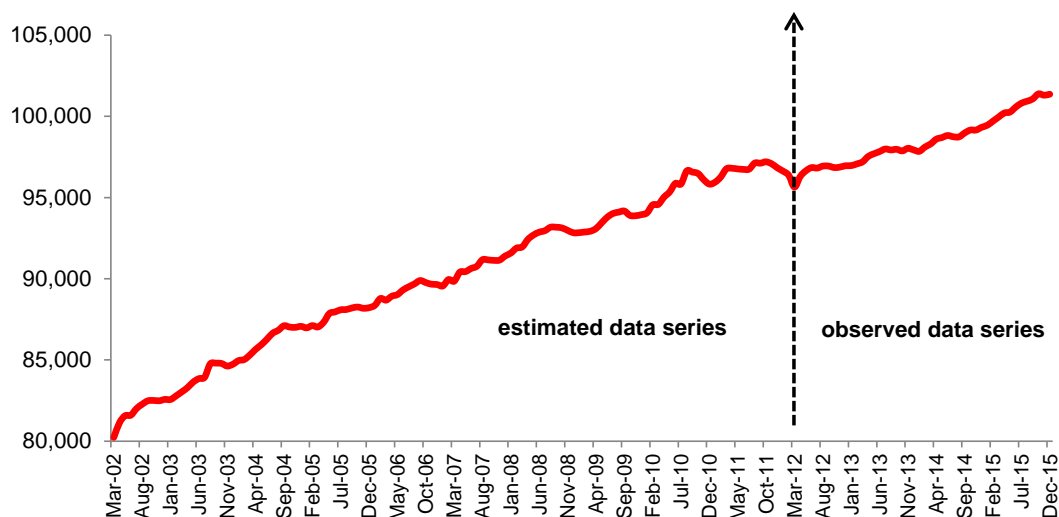
II. PNAD Labor Force



Source: IBGE, SEADE/DIEESE, MTE and Santander estimates



Continuous PNAD - Labor Force (in thousands of people)



Source: IBGE, SEADE/DIEESE and Santander estimates

III. PNAD Unemployment Rate

PNAD Unemployment Rate (%) - Entire National Territory - Estimates and Forecasts

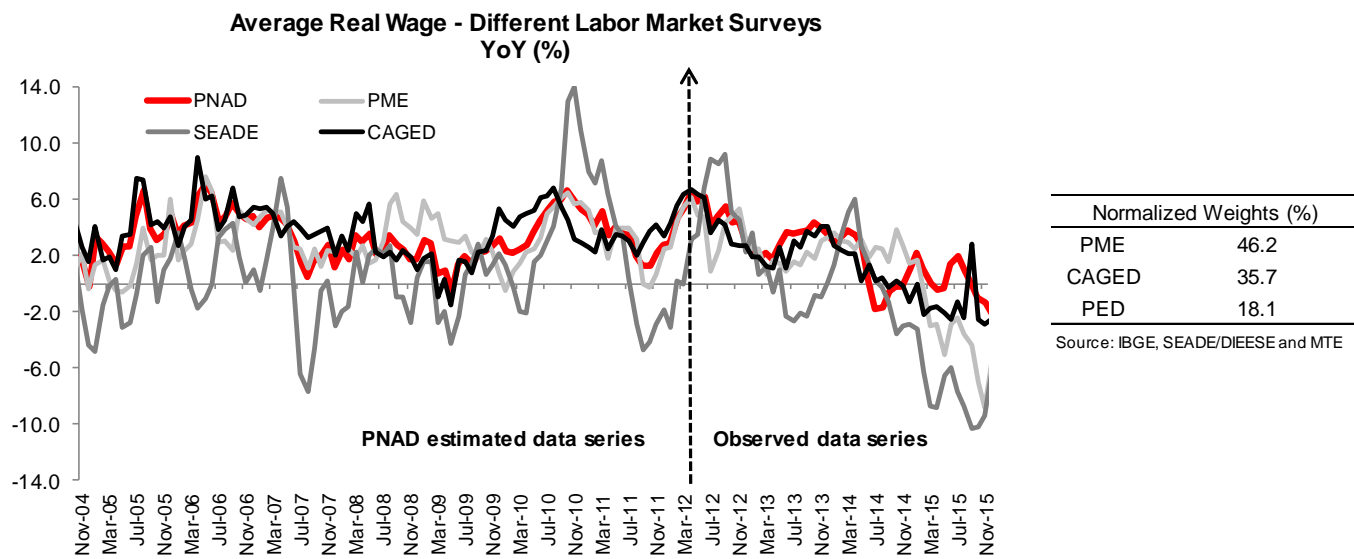
Year	Unemployment Rate (%) - annual average	Unemployment Rate (%) - end of period*
2002	10.8	10.9
2003	11.0	11.3
2004	11.0	10.7
2005	10.3	10.0
2006	9.9	9.7
2007	9.1	9.2
2008	8.9	8.9
2009	8.7	8.6
2010	8.0	7.7
2011	7.7	7.4
2012	7.3	7.1
2013	7.2	6.8
2014	6.8	7.2
2015	8.3	9.9
2016F	11.9	12.8
2017F	12.5	13.3

Source: IBGE and Santander estimates and forecasts

* seasonally adjusted series



IV. PNAD Average Real Wage



Source: IBGE and Santander estimates

PNAD Average Real Wage - Estimates and Forecasts

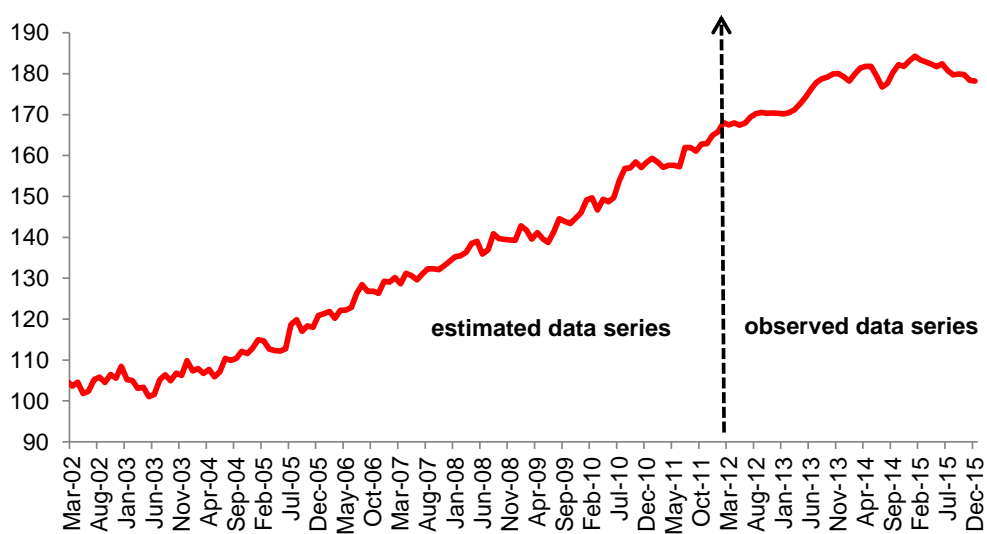
Year	Average Real Wage (BRL)	Average Real Wage - Annual Growth (%)
2002	1,442	-
2003	1,405	-2.6
2004	1,423	1.3
2005	1,473	3.5
2006	1,548	5.1
2007	1,593	2.9
2008	1,635	2.6
2009	1,665	1.9
2010	1,739	4.4
2011	1,794	3.2
2012	1,881	4.8
2013	1,940	3.2
2014	1,961	1.1
2015	1,964	0.2
2016F	1,909	-2.8
2017F	1,890	-1.0

Source: IBGE and Santander estimates and forecasts



V. PNAD Aggregate Real Wages

Continuous PNAD - Aggregate Real Wages (BRL billion)



Source: IBGE, SEADE/DIEESE, MTE and Santander estimates



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