

Income Inequality and Labor Market Dynamics in Brazil*

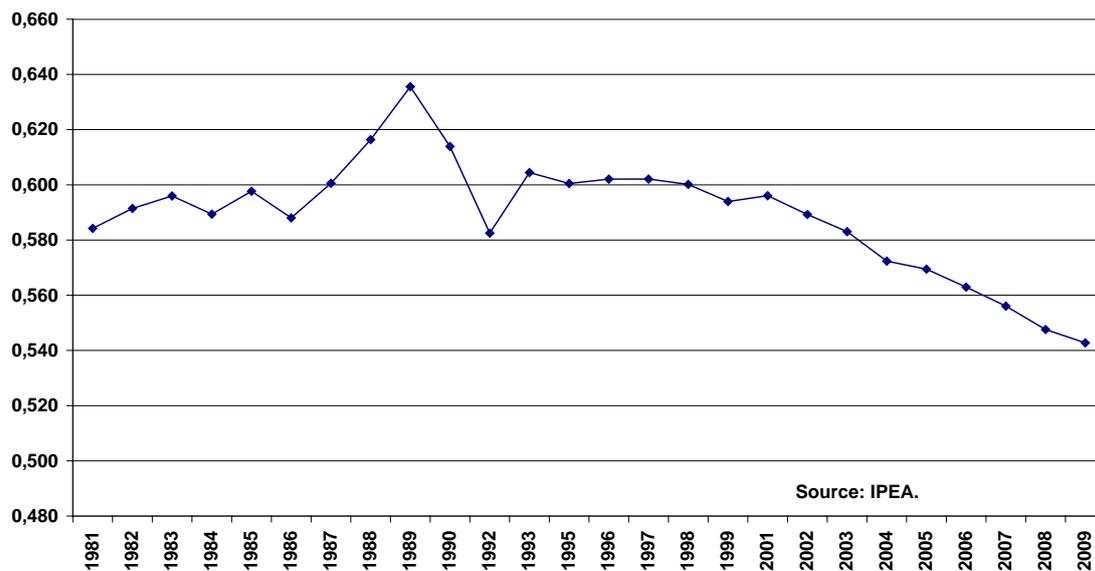
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1 - Introduction

Brazil is a country with one of the world's highest levels of income inequality.. However, income inequality has been reduced in the last 16 years. This decline in income inequality was due to several factors. Since 1996 , the end of hyperinflation has protected poorer people from inflation tax and this has helped reduce inequality but only to a mild extent.

From 1999 to 2002 inequality continues to fall on a consistent but discrete basis. The drop in income inequality accelerated after 2003 when Lula's government took office and deepened the minimum wage real gains policy. It also implemented the "Bolsa Família (BF)" (Family Grant) program. Both these policies led to a significant decline in income inequality in Brazil as can be seen in Figure 1.

Figure 1: Gini Index



Beyond the BF benefits and the increases in the minimum wage policy, the Brazilian labor market has experienced important improvements. Neri (2010) argues that these labor market improvements help to explain the drop in inequality due to an increase in years of schooling (higher education investments).

Unemployment in the metropolitan regions dropped from 13.2% in 2003 to less than 6% in 2012. The informal labor market reduced its size from more than 34.4% in 2004 to around 23% in 2012.

At the same time, labor market mobility increased towards labor formalization in Brazil. During the last years we observe an increase in the number of people that were

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previously working in an informal job, unemployed or out of the labor force that found a formal job.

Therefore, there was a combination of events that helped deepening inequality reduction in the Brazilian economy over the last ten years.

This note is organized in 6 sections including this introduction. The minimum wage policy and its impact on minimum wage and the minimum wage real increase are presented in section 2. Section 3 shows the evolution of Bolsa Família (BF) benefits and its costs. Section 4 summarizes the labor market dynamics of the last 10 years. It includes the decline in unemployment, the decrease of informality and the change in the transition matrix. The groups which have benefited most the decline of unemployment and informality are shown in section 5. Section 6 concludes this note.

2 – Minimum Wage Policy

Over the last 18 years the real minimum wage increased in the Brazilian economy as a result of a policy towards an increase in its purchase power. Between 1995 and 2009 the minimum wage had a 89% real. In 2009 the minimum wage represented 40% of the average wage.

The minimum wage increase was an important instrument for reducing inequality in previous years. Barros et al (2000) show that minimum wage increases cause inequality reduction.

Firpo and Reis (2006) show the minimum wage was very important in reducing inequality in the country, mainly in the high inflation period. Firpo and Reis (2007) corroborate their previous work showing that the minimum wage was more important for inequality reduction in periods of high inflation.

Table 1: Minimum Wage (MW) and Average Wage Evolution

	Nominal MW	Real MW	Real AW	MW/AW
1995	100.00	288.25	1250.36	23.1%
1996	112.00	284.13	1279.23	22.2%
1997	120.00	291.76	1267.65	23.0%
1998	130.00	305.75	1254.42	24.4%
1999	136.00	302.86	1169.35	25.9%
2000	151.00	314.26	0.00	28.1%
2001	180.00	349.14	1154.90	30.2%
2002	200.00	354.71	1128.77	31.4%
2003	240.00	362.19	1044.50	34.7%
2004	260.00	369.13	1035.93	35.6%
2005	300.00	405.64	1082.81	37.5%
2006	350.00	459.46	1158.84	39.6%
2007	380.00	475.09	1194.72	39.8%
2008	415.00	484.90	1210.60	40.1%
2009	465.00	522.43	1242.31	42.1%
2010	510.00	545.70		
2011	545.00	545.00		
2001 - 2009 Variation				
	158.3%	49.6%	7.6%	39.4%

Source: Self made with PNAD data.

Table 1 shows the nominal minimum wage, its real value, the average real wage and the minimum to average wage ratio. As can be seen in Table 1, the minimum wage increase was huge between 1995 and 2011. In the 2001-2009 period, the nominal wage increased by 158%, while the minimum real wage was almost 50%. Between 2002 and 2009, the minimum wage almost doubled its value in comparison with the average wage. In a very unequal country like Brazil, in which the average wage is below the 50th percentile wage, the minimum wage increase had some impact on the income of the poorest.

This sharp minimum wage increase in a short period created a discussion about the results of continuing this policy in terms of inequality results. Neri et al (2006) conclude that we are perhaps close to the maximum minimal wage in terms of inequality reduction. Therefore, minimum wage should not be a growth enhancement policy.

Barros and Carvalho (2005) argue that minimum wage increases are not cost effective in reducing inequality. A 10% minimum wage increase results in R\$3,1 billion additional expenditures but only R\$100 million go to the extremely poor families.

Soares (2006) and Barros (2007) use household data to find that BF is more effective in inequality reduction than minimum wage. Sabóia (2007) recognize the small effect of minimum wages on poverty reduction.

Afonso, Pereda, Giambiagi and Franco (2011) argue that the minimum wage is not anymore a cost effective way to reduce extreme poverty. Social focused policies as the Bolsa Família are more effective. Neri (2010) also indicates that the government should use target social programs, such as BF to reduce inequality even further. These programs are more cost effective.

3 - Bolsa Família Benefit

Bolsa Família Benefit (BF) is a government program that transfers money to the poorest people in the country with little conditions imposed. The main important condition refers to keeping children in school. The average value of each benefit is very low and the program is very focused. It is able to locate and transfer the resources to the poorest people with very low administrative costs.

Table 2 shows the evolution of the number of BF benefits distributed per year along the last 8 years. The government transferred resources for 6.5 million families in 2004 and increased the number of beneficiaries to 13.3 families in 2011.

Despite the low average benefit the program is very successful in reducing poverty because it really “targets” the poor, differently than the minimum wage benefit that benefits only part of the poor population.

	Number of BF Beneficiaries	Average Value of Benefit	BF as % GDP	Minimum Wage
2004	6.571.839	67	0.3%	260
2005	8.700.445	63	0.3%	300
2006	10.965.810	63	0.3%	350
2007	11.043.076	75	0.4%	380
2008	10.557.996	86	0.4%	415
2009	12.370.915	95	0.4%	465
2010	12.778.220	97	0.4%	510
2011	13.352.306	120	0.5%	545

Source: IPEA and Ministério do Desenvolvimento Social e Combate à Fome (MDS)

Table 2 allows a comparison of the minimum wage value with the BF average benefit. The average BF benefit was around 20% of the minimum wage benefit in 2011. The BF benefits are very much cheaper and cost only 0.5% of the GDP. Studies show that the BF is very focused while the minimum wage increase benefit only a small part of the poor . Furthermore, a R\$1 minimum wage increases costs around R\$300 million while the same R\$1 BF increase costs 13.3 million.

BF benefits have a lower cost benefit than minimum wage increases and also are more focused on reducing poverty. Therefore, as Afonso, Pereda, Giambiagi and Franco (2011) argue, government policy to reduce poverty should not focus anymore on minimum wage increases (because now only a small part of the people that receives minimum wage are poor). The government should continue to use social benefits to reduce poverty because it is more cost effective than minimum wages increase.

4 – Labor Market Dynamics

Over the last years the Brazilian labor market has gained some momentum. There is a new dynamics to the labor market with a lower unemployment and informality rate. Both reductions have occurred without any major labor market reforms. Therefore, the improved Brazilian macroeconomic environment was fundamental to this change.

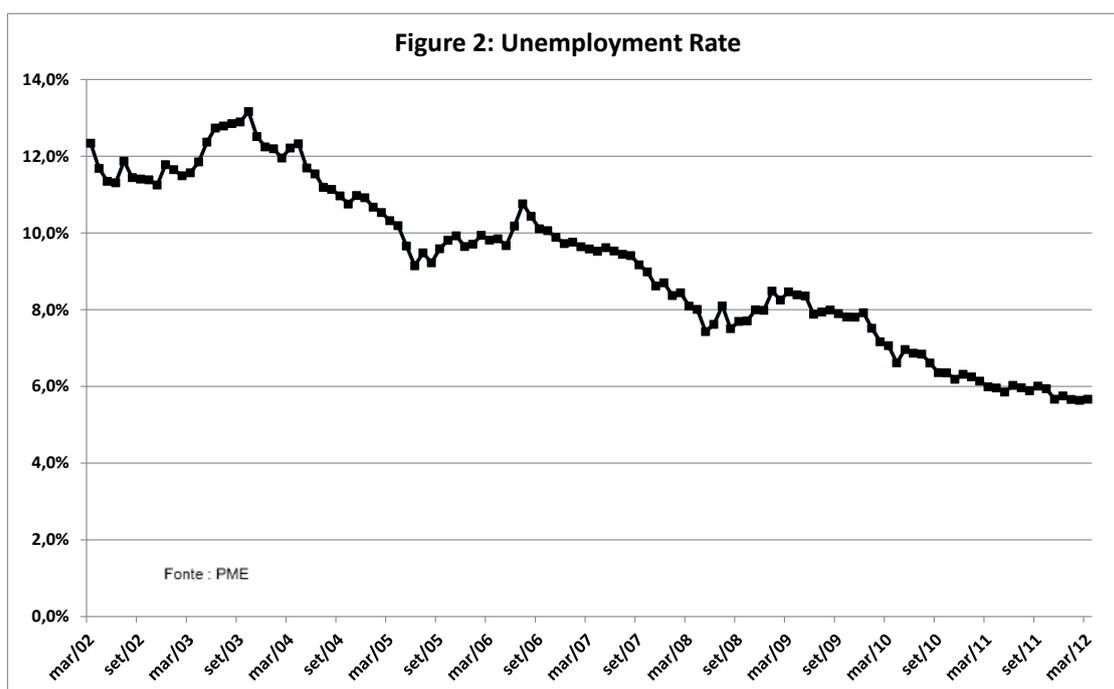
Table 3 shows Brazilian GDP growth over the last 17 years. Table 3 shows that the GDP average growth rate increased from 2.1% in the period 1999-2002 to 4% between 2003 and 2010. This GDP growth rate increase propelled the Brazilian economy and stimulated a new labor market dynamic.

1995	4.4%
1996	2.2%
1997	3.4%
1998	0.0%
1999	0.3%
2000	4.3%
2001	1.3%
2002	2.7%
2003	1.1%
2004	5.7%
2005	3.2%
2006	4.0%
2007	6.1%
2008	5.2%
2009	-0.3%
2010	7.5%
2011	2.7%
1995-1998	2.5%
1999-2002	2.1%
2003-2006	3.4%
2007-2010	4.5%

Source: IBGE.

4.1 – Unemployment Rate

The Brazilian labor market has changed in the last years in many different ways. First of all, the more stable economy boosts employment independent of any change in labor law regulation. The unemployment rate dropped from more than 12% in 2002 to a rate below 6% in 2012. The reduction in uncertainty due to a more stable macroeconomic scenario¹ stimulates investments and hiring by employers. Figure 2 shows that between 2002 and 2003 there was an increase in the unemployment rate which then dropped during the following years to around 6% in 2012. In the 2009 crisis we observed a slight increase in the unemployment rate which was again reduced in the following years.



The unemployed rate around 6% since December 2010 indicates that the Brazilian economy is on (or close to) its natural employment rate.

4.2 – Informal Labor Market

Informality is defined as the ratio between workers without a signed card and the sum of workers with and without a signed card. Brazilian household surveys allow us to identify those workers that have a signed card and those who does not have.

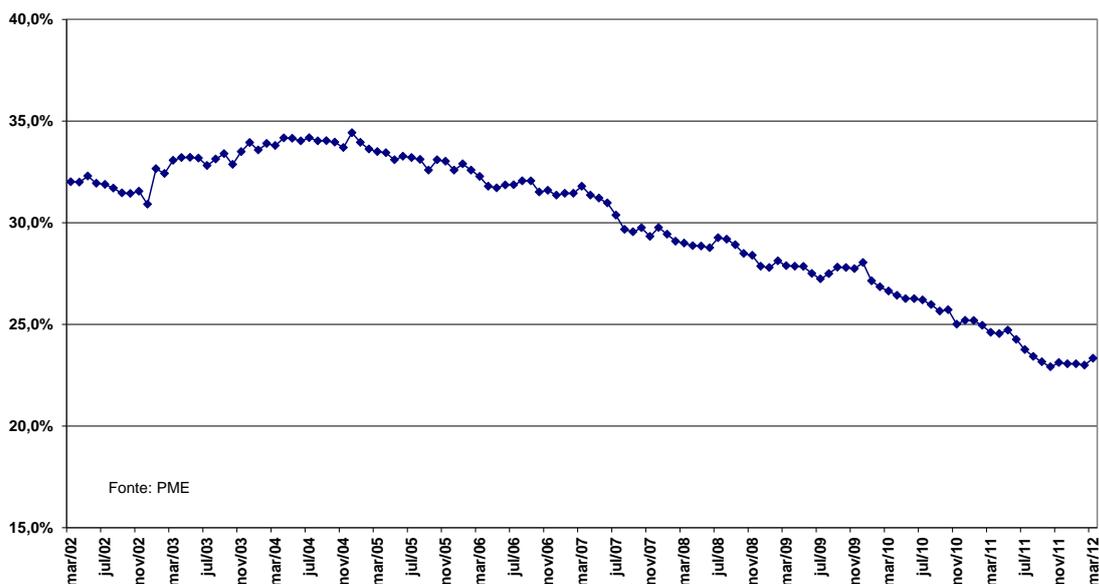
Figure 3 shows that between 2004 and 2012 the informality rate dropped from 34% to a ratio of 23.3% in March 2012.

The informality rate increased in 2003 and 2004, due to the low rate of activity of the Brazilian economy affected by the confidence crisis about Lula's government. After this two year period, when it became clear that Lula's Government would maintain the most important macroeconomic policies², there was an increase in institutional security and economic activity that helped reduce unemployment and informality rates.

¹ Low inflation, contract respect and lower political risks.

² Primary surplus, Inflation Targeting and Flexible Exchange rate.

Figure 3: Informality Rate



The informality rate drop is associated with the more stable macroeconomic environment of higher and stable growth rates, the increase in the Brazilian credit market and the educational policy. The resurgence of a mortgage credit market in Brazil created incentives for workers to demand their formality in the labor market. Housing credit in Brazil depends on formal proof of income. Therefore, there was an employee demand for formalization that did not exist before housing market resurgence.

4.3 – Education Attainment Increase

Over the last two decades the Brazilian economy witnessed a sharp increase in enrollment rates with more than 90% of children in school. This increase in enrollment rates is improving the average education of the labor force. As a result there was an increase in the proportion of more highly educated workers and a reduction in the importance of less education workers.

Table 4 shows the changes participation rate of the labor force per complete schooling cycles from 2002 to 2009. As can be seen, there is a drop in the relative weight of less educated workers in comparison to more highly educated groups.

Schooling Years	2002	2009
0-3	23.3%	16.3%
4-7	29.0%	23.1%
8-10	16.4%	17.0%
11-14	23.5%	33.0%
>15	7.8%	10.6%
Total	86,335,873	101,110,213

Source: Barbosa Filho and Pessôa (2011)

This increase in more highly educated workers is very positive for the labor market structure because the Brazilian economy has a relative scarcity of more highly educated workers. Neri (2010) argues that this labor market improvement helped to explain the drop in inequality due to an increase in years of schooling that leads to income improvements in the lower part of the distribution.

4.4 – Impact of Education on the Average Wage

As pointed out by Neri (2010), the labor market dynamics improved due to the increased importance of educated workers. This movement increased the number of employees that receive higher wages. In order to investigate these effects, in Table 5, we show: educational groups employment weight (Emp (%)), the real wage (RW), the average wage (AW) and the RW as a share of the average wage (AW).

	2002			2009				
	Emp (%)	RW	RW/AW (%)	Emp (%)	RW	RW/AW (%)	2002 Emp(%)	RW/AW (%)
0-3	24	473	45	17	565	47	565	52
4-7	29	698	67	23	935	78	935	86
8-10	16	844	81	16	859	71	859	79
11-14	23	1336	128	33	1235	102	1235	114
>15	8	3489	335	11	3192	264	3192	294
AW		1042			1207		1087	

Source: Author's using PNAD data.

Between 2002 and 2009 there was an increase in real wages for the low educational groups and a real wage decrease for the highly educated groups. The increase in more educated workers of itself improved the average real wage, as can be seen by the drop of average wage when using the 2002 participation by educated group (8th column). In this counterfactual exercise, we used the 2009 real wages with the 2002 educational groups weight. On this basis, the average wage (AW) drops 10% from R\$1207 to R\$1087. Therefore, the 15.8% real average wage increase between 2002 and 2009 can be explained by a 4.3p.p. increase in real wages and 11.5p.p. increase due to compositional changes in the occupied workers.

4.5 – Transition Matrix

This section shows the improvement in the transition between different labor market states: out of labor force, unemployment, formal job and informal job. In the labor market there is a probability of change between the different states over time. This section computes the transition probabilities among states using a monthly survey data base, Pesquisa Mensal de Emprego (PME).

Table 6 shows that between 2002 and 2011 the labor market changed significantly with respect to the informal/formal job. There was an increase in the flows from informal to formal jobs. This increase towards formal jobs was true for all different states: informal, formal, unemployed and out of labor force workers.

Table 6: Labor Market Transition Matrix					
2002					
	Informal	Formal	Unemployed	Out of Labor Force	Total
Informal	68.1	21.1	3.2	7.6	100.0
Formal	5.1	89.3	1.2	4.3	100.0
Unemployed	7.1	8.6	53.7	30.7	100.0
Out of Labor Force	1.9	3.4	4.3	90.4	100.0
Total	10.2	38.4	6.2	45.3	100.0
2011					
	Informal	Formal	Unemployed	Out of Labor Force	Total
Informal	66.6	23.0	2.0	8.4	100.0
Formal	4.2	91.0	0.8	4.0	100.0
Unemployed	7.3	13.2	47.0	32.6	100.0
Out of Labor Force	1.9	3.8	2.7	91.6	100.0
Total	8.9	44.3	3.3	43.5	100.0
Change between 2002 and 2011					
	Informal	Formal	Unemployed	Out of Labor Force	Total
Informal	-1.6	1.9	-1.2	0.8	0.0
Formal	-0.9	1.7	-0.4	-0.4	0.0
Unemployed	0.2	4.6	-6.7	1.9	0.0
Out of Labor Force	0.0	0.4	-1.6	1.2	0.0

Source: Barbosa Filho and Moura (2012).

The first two columns of the last part of Table 6 show an increase in formal job probabilities. At the same time we observe a drop in the unemployment state that is related with the more vigorous economic activity.

There was also an increase of people that were unemployed and left the labor market; at the same time this increased by 4.6% the probability that someone unemployed would get a formal job.

5 – Beneficiaries groups

5.1 – Unemployment Rate

The decline in unemployment in the Brazilian economy was not evenly distributed among all segments of the labor market. Table 7 shows unemployment data for different educational attainment for the years of 2002, 2008 and 2009, the last year available for the PNAD household data.

The unemployment rate in Brazil has an inverse “U” shape relation by educational group. Employees with less than 4 years of schooling face a low unemployment rate that increases for workers with education between 4 and 7 years and reaches the top unemployment rate for individuals with 8 to 10 schooling years. The unemployment rate decreases for individuals with education between 11 and 14 schooling years. College graduates have the lowest unemployment rate.

Table 7: Unemployment by Education Group			
	2002	2008	2009
0-3	5.5%	4.2%	5.0%
4-7	9.6%	6.3%	7.8%
8-10	13.8%	10.7%	12.2%
11-14	10.4%	8.4%	9.7%
>15	4.6%	4.0%	4.1%

Source: Barbosa Filho and Pessôa (2011)

Table 7 shows that individuals with an educational background between 4 to 10 schooling years benefited most from the decline in the unemployment rate in Brazil. The unemployment rate declined 3.3% between 2002 and 2008 for individuals with education between 4 and 7 schooling years. The second group that had a significant drop in unemployment comprised workers between 8 and 10 years of education for whom the unemployment rate dropped by 3.1%.

However, the unemployment rate increase during the 2008/2009 crisis also hit this group harder. The unemployment rate increased 1.5% for workers between 4 and 7 years and 8 to 10 years of education. At the same time, the unemployment rate increased only 0.1% for college workers, 0.8% for 0 to 3 schooling years workers and 1.3% to high school workers.

This shows that the drop in the unemployment rate benefited individuals with a lower to middle education, the “marginal” workers. These marginal workers were the first to lose their job in the 2009 crisis.

This result shows that the education process must continue to advance in Brazil in order to achieve more permanent results in terms of unemployment reduction.

5.2 – Informal Rates

An analysis of the changes in informality between groups with different educational groups is shown on Table 8. It shows that the reduction in informality was more important for highly educated groups. This result goes in the opposite direction to the drop in unemployment that benefited less educated groups.

This signals that less educated workers could not impose a higher drop in informal jobs. For the group with higher unemployment rates (people with 8 to 10 schooling years) the informal rates almost did not fall. This result suggests that the drop in informality was higher for individuals that could demand an increase in their rights, but did not have a global effect benefiting even the marginal workers.

Table 8: Informality by Education Group			
	2002	2008	2009
0-3	62.8%	59.7%	59.1%
4-7	50.4%	47.9%	48.7%
8-10	42.1%	42.1%	41.9%
11-14	28.7%	25.4%	24.7%
>15	26.1%	24.5%	23.4%

Source: Barbosa Filho and Moura (2012)

Barbosa Filho and Moura (2012) show that almost 60% of the drop in informality between 2002 and 2009 is due to compositional stemmed from changes in the educational composition of the labor force.

5.3 – Transition Matrix by Education Group

A different aspect of the labor market is the probability of changing labor market status faced by individuals. The previous sections showed significant structural changes in the Brazilian labor market between 2002 and 2011: a large real minimum wage increase, an increase in importance of more educated workers in the labor force, a drop in informality and an increase in the average wage.

Table 9 shows the change in probability for an individual to move from his labor market state in period t to a formal job in period t+1 between 2002 and 2011 for five different educational groups.

Table 9 shows that in the last years the probability to move from any other state in the economy to the formal job increased for almost every group. The increase was more evident for individuals that were unemployed and got a formal job. For informal workers, there was an increase in this probability for individuals with 11 to 14 years of education and 4 to 7 years of education. Individuals with 8 to 10 years of education that were in the informal market were less likely to find a formal job in 2011 than in 2002.

Previous Period state	2011-2002				
	0-3	4-7	8-10	11-14	>15
Informal	-1.5	1.1	-0.5	1.3	-5.2
Formal	3.2	1.2	0.9	0.4	0.0
Unemployed	28.7	4.1	5.5	6.8	2.0
Out of labor Force	-0.3	0.1	0.6	1.1	0.5

Source: Barbosa Filho and Moura (2012).

The most striking result in Table 9 shows the probability increase for unemployed workers to find a formal job. This increase benefited all workers with a special increase for unemployed workers with almost no education.

6 – Conclusion

This note has examined the reduction in income inequality in Brazil over the last years. This drop was the result of several policies that worked simultaneously. First, there was a minimum wage increase that reduced income inequality by increasing the income of the low percentiles of the Brazilian labor force. A second effect was the impact of social policies, like the Bolsa Família Program, that targeted the poorest and has proved to be a very cost effective program. Finally, there was a structural change in the labor market that increased the relative weight of more educated groups in the economy.

The literature shows that the real increase in the minimum wage was very substantial and an important component of inequality reduction in Brazil. However, there is some evidence that this policy is no longer cost effective. The government should stop using minimum wage increases as a policy to reduce inequality and adopt more cost effective programs as the BF.

The literature also shows the BF program is a very effective program that targets the poor and costs only 0.5% of Brazilian GDP and benefits more than 13.3 million.

The labor market dynamics of the last years shows a drop in the unemployment rate and a reduction in informal jobs. These two movements are associated with the new

economic growth regime of the Brazilian economy that increased its growth rate from an average around 2% between 1995 and 2002 to an average around 4% between 2003 and 2010. This new economic regime associated with an increase in the importance of more highly educated group in the labor market and credit expansion helped explain the unemployment drop and the reduction in informality.

Higher economic growth reduced economic uncertainty. It has stimulated an increase in employment and consequently a decline in unemployment. The reduction in unemployment was stronger among the less educated. However, the 2009 crisis shows that the less educated groups were the ones that observed a larger increase in unemployment rates in the period. This indicates that the unemployment rate decline benefited most the “marginal” workers, the low educated workers.

Credit expansion increased labor demand for a formal job. At the same time, the increase in relative weight of educated groups in the labor market helped reduce informality. The increase in the relative importance of more highly educated workers accounts for 60% of the reduction in informality through the compositional effect. The drop in the level of informality did not benefit “marginal” workers to the same extent as the unemployment reduction. The reduction of informality was not higher for low educated groups.

Finally, this note shows that structural changes combined with a more stable domestic macroeconomic environment increased the probability of finding a formal job irrespective of the educational group and the previous labor market status.

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