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Executive Summary

Agriculture is a key sector of Brazil’s economy and competitive in the global economy. The agricultural sector has contributed to the expansion of the Brazilian economy over the past four decades, as Brazil became the world’s third largest producer of agricultural products behind the EU and the US. Overall, the agribusiness sector accounts for one-fifth of GDP, provides 15 million jobs, and represents about half of Brazil’s exports. The sector is diverse and production and farm characteristics vary substantially across regions. Output is dominated by a small number of very large farms, primarily in the Center-West and South, while the large number of small farms in the Northeast accounts for only a tiny fraction of the output. The agricultural sector is also Brazil’s main source of greenhouse gas emission and deforestation. Climate change is expected to change the dynamic of agriculture in Brazil and further increase the exposure to natural disaster risks.

Government support for the agriculture sector in Brazil has been limited, but focused mainly on rural credit as a policy tool. The overall level of public subsidies granted by Brazil to agriculture is lower than in peer countries. Overall, it is estimated that the fiscal costs of the agriculture support programs stand at 0.35 percent of GDP (R$ 22.7 billion) in 2017. Agricultural subsidies account for slightly more than one-quarter of all subsidies (for benefícios financeiros e creditícios) paid in 2017. The total is roughly equally split between direct and indirect subsidies. Direct agricultural subsidies of R$ 11.1 billion accounted for around 0.9 percent of total fiscal expenditures in 2017. Although modest as an overall agriculture support subsidy, it is a substantial financial sector subsidy. In previous decades, unstable macroeconomic conditions with high inflation and interest rates, led policymakers to pursue directed lending programs to support agriculture. However, market conditions have changed, questioning the efficiency, targeting, and effectiveness of the current programs.

The government programs are funded through a complex system of mandatory lending quotas and direct and indirect public subsidies. Although there is a multitude of programs, the biggest programs are PRONAF and PRONAMP, which aim to support small family farms and medium-sized producers, respectively. Funds are primarily channeled via public banks to earmarked beneficiaries at capped interest rates. The government programs are the main source of rural credit and about half of the farmers that have a loan, have obtained this loan through government programs. However, in recent years the number of farmers obtaining credit through public programs has declined, and market-based instruments, such as agricultural letters of credit, are gaining importance, especially for large farms.

Programs provide only limited funding for low-carbon agriculture, which is key for a structural transformation of agriculture to more sustainable practices. The government supports climate smart agriculture through its ABC program. However, it faces limited demand and volumes appear to be modest relative to the investment required to meet Brazil’s reforestation targets and, more broadly, to shift agricultural production to more sustainable practices. Literature suggests that making access to

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1 Fiscal costs of the programs consist of direct subsidies, via interest equalization, and indirect subsidies, through constitutional funds and BNDES funding. Costs also stem from tax exemptions granted for some rural finance instruments.

2 A separate analytical piece is being conducted on “Decoupling agricultural production and deforestation,” analyzing how credit impacts the rural economy, land use and deforestation.
subsidized credit conditional upon compliance with environmental regulations contributed to reducing deforestation in the Amazon biome. While the relationship between credit and deforestation needs to be investigated further, the enhancement of performance-based incentives (that can be related to credit) can be an effective policy instrument to reduce illegal deforestation. A separate analytical work currently being conducted on the impact of credit on land use and deforestation will shed relevant findings on this area.

Access to credit for the agricultural sector is limited and concentrated. Although the volume of rural credit has increased steadily over the last decades, farmers’ access to credit remains low. Only 15 percent of farms report having access to credit and access varies substantially across regions, with the North and Northeast regions particularly underserved (with 9 – 12 percent of farmers reporting having credit, and with 13 percent of bank lending to these regions). These regions also have the lowest density of branches and service points. Credit is very concentrated in a small number of large farms and products, while the vast majority of small farms receives only a small share of total credit.

The majority of rural credit is for short term working capital financing, with limited longer term investment financing, which is critical to support agriculture expansion, and particularly sustainable agriculture. Long term financing is low, due to several reasons, including inter-alia, the historic macroeconomic volatility, banks’ lack of long-term funding, and farms’ difficulty to comply with environmental regulations. Long-term financing is particularly relevant to support the capital investment needed for the adoption of sustainable agriculture production technologies.

Empirical analysis shows that government-driven lending through public banks (half of rural credit lending volume in the country) is concentrated in a small number of large and more established farms. This policy note analyzes a novel dataset of 7.6 million loans and finds that a large portion of public banks’ lending is directed to a small number of corporate loans, but with large amounts (corporate loans consist of about 5 percent of the number of contracts, but account for 36 percent of total loan volume). In addition, public banks are lending to firms that have a longer credit relationship with the bank (firms that receive earmarked loans from public banks are on average 11 years older than firms receiving earmarked credit from private banks). In addition, most rural credit is being provided to individual farmers with higher incomes. Half of loan contracts were to individuals with monthly income above 10 minimum wages, and this group accounted for 67 percent of the total volume to individuals. Individuals receiving earmarked credit from public banks have higher income than earmarked recipients from private banks.

New evidence suggests that a large portion of public banks’ credit is allocated to firms that may not have constraints in access to finance. The loan level analysis reveals that most firms receiving rural loans from public banks have multiple credit relationships with private banks (79 percent of public bank lending in rural finance is allocated to firms that have outstanding credit with at least one private bank). Most

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3 CPI (2016) The Effect of Rural Credit on Deforestation: evidence from the Brazilian Amazon. By 60 percent relative to the baseline scenario.

4 Data in the sample has loan-level observations from new loans classified as agricultural credit between 2013 to 2018. The information is available in the Credit Registry managed by the Central Bank. Each loan record includes a borrower identifier, the identification of the financial institution, and the loan start date. The sample has a total of 7.6 million loans. We consider banks that belong to a financial conglomerate as a single financial institution and exclude banks with less than 100 loans during the entire period. In turn, we end up with 3 public banks, 32 private commercial banks, and 447 credit cooperatives. These financial institutions extend rural loans to 46,465 different firms and over 1.5 million individuals.

5 There is no counterfactual of what would be the credit allocation if public credit was not available.
individuals on the other hand, only have a credit relation with a single bank. Thus, while firms in the rural sector have multiple sources of financing through several bank relations, individual farmers seem to have more limited alternatives to access commercial credit.

**Importantly, private banks (accounting for 36 percent of rural credit) allocate earmarked loans to farms that are less risky (similarly to public banks), while credit cooperatives tend to serve riskier clients.** Amongst private banks, earmarked loans are smaller than free-market loans, are focused on clients with a longer credit relationship, and finance loans with better credit ratings. Once the empirical analysis adjusts for borrower characteristics and loan conditions, it indicates that private banks charge similar interest rates between free-market and earmarked loans, thus suggesting that they are financing lower risk borrowers - those that would have obtained free-market credit at the same low interest rates as with government programs. Contrary to banks, credit cooperatives charge lower risk-adjusted interest rates in earmarked loans, suggesting that credit cooperatives take on additional risk by extending earmarked credit to farmers that are otherwise riskier. There is no evidence of informational spillover effects from earmarked credit to free-market credit. Rural earmarked lending is highly persistent: farms that receive earmarked loans are more likely to obtain new financing through additional earmarked credit.

**It is time to rethink whether current public programs reach their intended objectives.** Regional distribution trends, limited funding for sustainable agriculture, and the recent decline in loans to small farms raise questions about the optimal design and targeting of government programs. The share of farmers using credit funded by government programs, including PRONAF, is substantially lower in the poor Northeast, which is home to the vast majority of small farms, than in the more developed South. Loans outside government programs are gaining importance, especially for larger farms. Banks are focusing on larger loans and have reduced lending to small farms. Relative to private banks, public banks seem to have a larger focus on smaller loans to individual farmers. However, public banks have recently increased their lending to large firms in the sector, as seen in the systematic decline in small loans during recent years.

**While the fiscal costs appear modest, especially since the rural credit programs are the main source of the government’s support to the agriculture sector, the programs create large distortions for the financial sector and come at costs for all Brazilians.** The public interventions come at costs to financial intermediation and the efficiency of resource allocation. The mandatory lending quotas constrain the volume of funds that banks can lend to non-earmarked segments and there is some evidence that banks compensate the impact of capped earmarked rates on their profitability by charging higher rates on non-earmarked credit. Another flip side of the cheap funding sources of rural credit via mandatory quotas on deposit and savings accounts is that savers often receive limited remuneration and constrained savings options. Earmarked credit also reduces the efficiency of monetary policy transmission. The distortions to the financial sector thus call for revisiting the funding mechanisms and design of agricultural support.

**The increasing importance of the challenges of climate change-related risks in Brazil makes it necessary to foster the supply of well-designed insurance and risk management instruments.** The provision of insurance premium subsidies has promoted the expansion of commercial agricultural insurance, but there are limitations in the predictability of resources, pricing and payout policies, and how the subsidies are distributed. In addition, policies addressing agricultural risks, especially production risk, have significant limitations in their design that originate from outdated market conditions.

**The risk management programs face important challenges that limit the authorities in implementing a comprehensive risk management and cost-effective risk financing approach.** The lack of integration of
all different programs results in duplication of efforts and unnecessary use of resources. The lack of a risk financing strategy, an overall poor coordination and alignment of the programs, deficiencies in pricing and payout policies, as well as lack of integration of existing data on risks and yields, result in an inefficient and unpredictable demand for public resources, while providing a justification for frequent loan rescheduling / loan forgiveness programs.

Against this background, this policy note recommends to limit agriculture credit policies to the segments that most need them, redirect public subsidies to support critical positive externalities, and strengthen risk financing instruments that would make access and terms of agriculture credit more favorable. The agriculture sector policy is vulnerable as it currently depends mostly on its agriculture credit program to develop the agriculture sector. This is limiting in terms of public policy and program tools. Therefore, it is important to reduce the importance of public support to agriculture credit and develop risk management instruments, such as insurance, disaster response, credit guarantee fund, etc. as outlined in this policy note.

**The policy note proposes reforms in four key areas:**

(i) **Reform of lending programs for family farms.** It is essential to significantly streamline the subprograms under PRONAF to reduce complexities; to revise the form in which loans are subsidized to ensure adequate support for small farms; and strengthen effective matching grants programs that address the capacity constraints for small farms.

(ii) **Reform of interest rate controls and subsidies for lending to medium and large farms.** It is recommended to phase out quotas and interest rate caps for medium and large farms (they have more than half of public subsidy resources), and to redirect subsidies/ incentives to lending programs for large farms towards public goods.
   a. Eliminate any interest rate controls and the use of quotas for loans granted to large farms;
   b. Revise the programs for mid-sized farms, following an analysis of market conditions and phase out quotas and interest rate caps gradually;
   c. Streamline programs to medium size farmers to: a) reduce their number, b) harmonize and simplify conditions and procedures, c) enhance their effectiveness;
   d. Redirect subsidies/ incentives to lending programs for large farms by targeting the allocation of subsidies exclusively to the financing of programs that clearly contribute to public goods (e.g. lower carbon agriculture)

(iii) **Reform of financial instruments to manage risks.**
   a. Reform existing programs, including PSR (insurance subsidies), Proagro, and Proagro Mais. Given the underdevelopment of the agriculture insurance, consider shifting some public support from rural credit towards insurance, to expand the reach of agricultural insurance for small and medium farmers. Government actions are necessary to provide certainty and predictability about the availability of resources to subsidize insurance premiums;
   b. Introduce an integrated disaster risk management and agricultural finance risk strategy using a public-private partnership model (PPP);
   c. Strengthen the use of market-based instruments for price support;
   d. Consider the introduction of a partial credit guarantee scheme to serve agriculture.

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6 A detailed analysis of the main shortcomings can be found at Arias et al., 2016
(iv) Reform of coordination and monitoring frameworks, and improve data for agriculture finance. It is recommended to strengthen coordination among the different stakeholders and improve the monitoring of the effects of government interventions. In addition, tools like the agroclimatic zoning should be supported and improved as a basis for helping develop the rural finance market.

The table below summarizes the key recommendations and indicates the responsible authorities as well as the proposed timeframe.

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Responsible Authorities</th>
<th>Time*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reform of lending programs for family farms (¶ 73-77)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Revise the form, in which loans are subsidized to ensure adequate support for smaller loans.*</td>
<td>MAPA/BCB/MoE</td>
<td>NT</td>
</tr>
<tr>
<td>2 Streamline PRONAF subprograms to reduce complexities.*</td>
<td>MAPA</td>
<td>NT</td>
</tr>
<tr>
<td>3 Strengthen matching grant programs that address capacity constraints for the growth of small farms.*</td>
<td>MAPA/MoE</td>
<td>MT</td>
</tr>
<tr>
<td>Reform of interest rate controls and subsidies for lending to medium and large commercial farms (¶ 78-82)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Eliminate any interest rate controls and the use of quotas for loans granted to large farms.*</td>
<td>MAPA/BCB/MoE</td>
<td>NT</td>
</tr>
<tr>
<td>5 Revise the programs for mid-sized farms, following an analysis of market conditions and phase out quotas and interest rate caps gradually.*</td>
<td>MAPA/BCB/MoE</td>
<td>NT</td>
</tr>
<tr>
<td>6 Streamline programs to medium size farmers to: a) reduce their number, b) harmonize and simplify conditions and procedures, c) enhance their effectiveness.*</td>
<td>MAPA</td>
<td>NT</td>
</tr>
<tr>
<td>7 Redirect subsidies/ incentives to lending programs for large farms by targeting the allocation of subsidies exclusively to the financing of programs that clearly contribute to public goods (e.g. lower carbon agriculture). Δ</td>
<td>BCB/MAPA/MoE</td>
<td>NT</td>
</tr>
<tr>
<td>Reform of financial instruments to manage risks (¶ 83-98)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Reform and consolidate existing risk management programs, including PSR (insurance subsidies), Proagro, and Proagro Mais. Δ</td>
<td>MAPA/BCB</td>
<td>NT</td>
</tr>
<tr>
<td>9 Consider merging Bolsa Estiagem and Garantia Safra. Δ</td>
<td>MAPA</td>
<td>NT</td>
</tr>
<tr>
<td>10 Introduce an integrated disaster risk management and agricultural finance risk strategy using a public-private partnership model (PPP).*</td>
<td>MAPA/MoE</td>
<td>NT</td>
</tr>
<tr>
<td>11 Review the role of the Crop Insurance Stabilization Fund (FESR). Δ</td>
<td>MAPA/MoE</td>
<td>NT</td>
</tr>
<tr>
<td>12 Strengthen the use of market-based instruments for price support.*</td>
<td>MAPA</td>
<td>I</td>
</tr>
</tbody>
</table>

* Associated with economic or financial goals.
Δ Associated with rural development goals.
NT Not time-bound.
MT Medium term (1-5 years).
I Immediate action (less than 1 year).
Consider the introduction a partial credit guarantee scheme to serve agriculture. Δ●

<table>
<thead>
<tr>
<th>13</th>
<th>Reform of coordination and monitoring frameworks (¶ 99-105)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Reform of coordination and monitoring frameworks, and improve data for agriculture finance. *</td>
</tr>
<tr>
<td>15</td>
<td>Strengthen coordination among the different stakeholders and improve the monitoring of the impact of government policies *</td>
</tr>
<tr>
<td>16</td>
<td>Support and improve tools like agroclimatic zoning as a basis for helping develop the rural finance market. *</td>
</tr>
</tbody>
</table>

* I (immediate) = within one year; NT (near term) = 1–3 years; MT (medium term) = 3–5 years.
Δ indicates measures that require legislative actions; ● indicates measures that require regulatory actions.
1 Introduction

1. This Policy Note (PN) provides an analysis of the rural finance system in Brazil. The PN aims to inform policy-making on agriculture finance policies at a relevant time for the reform agenda. Its main objective is to provide recommendations on potential reform areas for agriculture finance, in order to: a) enhance the targeting of public resources; b) reduce the distortions caused by agricultural finance policies to the financial sector; and c) crowd-in private sector financing for agriculture. The PN does not aim to analyze how to support agriculture policy more generally, its impact on the environment, or on the real economy. A separate analytical piece is being conducted on “Decoupling agricultural production and deforestation,” analyzing how credit impacts the rural economy, land use and deforestation, complementing the current scope of this PN.

2. The following is the outline of the PN:

- Section 2 starts with a description of the structure of agriculture sector in Brazil highlighting the geographic and farm-size heterogeneities, as well as the challenges stemming from climate change.
- Section 3 discusses the sector’s access to finance and focuses on how regional and farm heterogeneities affect differences in access to credit.
- The main section of the PN, Section 4, focuses on public policies aimed at supporting rural finance. It starts with a detailed description of the structure of the National Rural Credit System, outlining the funding sources and the main rural credit programs. This description sets the stage for an analysis of the reach and targeting of rural credit programs, thorough an empirical analysis of 7.6 million loan-level data from 2013-2018. The section discusses how the resources of rural credit programs are allocated among farms and regions by various financial institutions, and the impact on access to finance. It also outlines the distortions caused by the subsidies in terms of direct and indirect fiscal costs, distortions to financial intermediation and resource allocation, and the impact on savers. Section 4.2 focuses on risk mitigation and insurance programs.
- Finally, Section 5 outlines, based on the previous analyses, policy recommendations for reforming agricultural finance.

2 Agriculture Sector Background

3. The agricultural sector has contributed to the expansion of the Brazilian economy over the past four decades and has consolidated Brazil as an important global player. Agribusiness accounts for one-

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7 This Policy Note was prepared by a team led by Bujana Perolli (TTL, Sr. Financial Sector Specialist), consisting of: Juan Buchenau (Sr. Financial Sector Specialist), Oliver Masetti (Financial Sector Specialist), Pablo Valdivia Zelaya (Sr. Agribusiness Specialist, on risk management instruments), and Alvaro Morales (Research Economist, DEC, with contributions also by Tatiana Didier, for empirical analysis). Agroicone consulting firm provided early data analysis. The PN was coordinated with the Agriculture GP (Barbara Farinelli and Maurizio Guadagni). Valuable comments have been received by Rafael Munoz (Program Leader, EFI), Zafer Mustafaoglu (PM, FCI), Steen Byskov (Sr. Financial Sector Specialist), and Diego Arias Carballo (Lead Economist).

8 Led by the Environment Global Practice.
fifth of GDP, provides 15 million jobs, and represents about half of Brazil’s exports. Brazil is a leading exporter of beef, chicken pork, soybeans, sugarcane, coffee, tropical fruits, frozen concentrated orange juice, corn, cotton, cocoa, tobacco and forest products. Overall, Brazil is the world’s third-largest exporter of agricultural products, behind the EU and the United States (FAO 2014).

4. **Brazil’s five regions are very different in terms of agricultural production characteristics:**

- **The North region** is mostly covered by the Amazonian forest. Fisheries, forestry, and livestock activities are predominant, with an extensive production system on large areas. Deficiencies in land titling in this region constitute important constraints.

- **The Northeastern region** is considered a “traditional” agricultural region in which production is more diversified. This region shows the largest concentration of very small producers who face substantial climatic constraints for agricultural production. They also have more restricted access to services and technical assistance, with the exception of the Cerrado biome, which has better conditions for production and is known as the new agriculture frontier in Brazil. This region concentrates the highest level of poverty and illiteracy, and a lower presence of producer cooperatives.

- **The Center-West region** is more concentrated on commercial agricultural production, mainly in soybean and cattle, which represent about 50 percent of the region’s agricultural production value. This region is characterized by large rural properties and well capitalized producers. It accounts for roughly one-third of total cultivated land.

- **The South and Southeast regions** are Brazil’s other “traditional” production regions, with a high number of small, yet efficient producers engaged mainly in the production of coffee, rice, corn, sugarcane, poultry and swine. These two regions have diversified economies and better infrastructure. They show also a high level of organization through farmers’ cooperatives.

5. **Farm characteristics vary substantially across regions.** While there are more than five million farms in Brazil, the cultivated area is heavily concentrated in a few very large farms. The largest 50,000 farms, although accounting for only 1 percent of Brazil’s five million farms, occupy almost half of the cultivated area. The average size of these farms exceeds 3,200 hectare. Most of them are located in the Center-West. In contrast, there are over 2.5 million very small farms with an average size of only 3 hectare. Almost 60 percent of these small farms are located in the Northeast.

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9 Soybean complex, meat complex, sugar and ethanol complex, forestry products (mainly pulp) and coffee were responsible for 79.5 percent of agribusiness exports in 2017.
6. **Agriculture is Brazil’s main source of greenhouse gas (GHG) emissions, accounting for an estimated 73 percent of total gross emissions in 2016.** Deforestation used to clear land for agriculture and cattle, as well as pastures used for cattle production contribute to high GHG emissions. Brazil’s climate pledge, or National Determined Contribution (NDC), aims at reducing GHG emissions by 37 percent below 2005 levels by 2025, with an “indicative target” of 43 percent by 2030. This makes Brazil the largest developing country to set an economy-wide emissions target in its NDC. The Government’s Agriculture NDC Plans, focus on strengthening the Low-Carbon Agriculture Plan (ABC), as the main strategy for sustainable agriculture development. Brazil has also committed to restoring or reforesting 12 million hectares of land by 2030 (UNFCCC 2015).

7. **Brazil’s agriculture sector is heavily exposed to climate risks.** Brazil loses annually, on average, around 1 percent of its agricultural GDP due to extreme climate events. Severe droughts account for around 50 percent of the most catastrophic events ever recorded in the country. During the last fifteen years, the cumulative economic damage caused by four extreme events (2004, 2012 and 2014) amounted to US$ 8.11 billion. The Northern and Southern regions are the geographic areas most impacted by droughts. The study Brazil 2040 shows that the impacts of climate change may be significant in the Brazilian agricultural sector, affecting not only production volume, but also the production geography with relevant local socioeconomic impacts. The main adaptation measures identified are irrigation, genetic improvement, crop-livestock-forest integration, infrastructure and logistic improvements. These measures will require high investments from producers and access to long term financing for these investments.

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10 2016 Agriculture, Forestry, and Land Use (AFOLU) Emissions according to Greenhouse Gas Emissions and Removals Estimates (SEEG)
3 Overall Access to Credit for the Agricultural Sector

8. The volume of rural credit increased steadily over the last two decades, but farmers’ access to credit remains low. Rural credit increased by an annual average of 19 percent in nominal and 10 percent in real terms between 1996 and 2015. During this period, rural credit grew substantial faster than value added in the agribusiness sector and Brazil’s economy as a whole. Consequently, the ratio of rural credit to GDP increased from less than 1 percent of GDP in 1996 to 2.7 percent of GDP in 2015. However, starting in 2015, real rural credit growth turned negative and the ratio of rural credit to GDP fell by 0.2 percentage points. Despite the strong credit growth over the past decades, only 15 percent of all farmers report having a loan in the 2017 Census.

![Figure 2: Agribusiness Sector and Rural Credit Over Time](image)

Source: Banco Central do Brasil, Cepea

9. Access to financial services varies substantially across regions. The aggregate numbers hide stark regional differences. While 30 percent of farmers in the Southeast have access to credit, less than 12 percent of farmers in the North and Northeast do. The geographic differences in access to credit are mirrored by the distribution of bank branches and access points across the country. The North and Northeast region have by far the lowest density of bank branches. These regional differences are not mitigated through credit cooperatives, as 79 percent of them operate in the South and Southeast. The ratio of total service points per 10,000 adults is still only around half in the Northern regions, compared to the South.

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13 The agribusiness sector expanded by an annual average of 8 percent in nominal terms and 0 percent in real terms from 1996 to 2015.

14 While there are around 1.6 bank branches per 10,000 adults in the Southeast and South, the ratio is less than half in the North and Northeast.
10. **Rural credit is also very concentrated in large farms and a few products.** In 2017, large farms received 44 percent of the rural credit volume, although they only accounted for 6 percent of the number of loans. In contrast, small farms, which account for three-quarters of the number of loans, received only 20 percent of the loan volume. The product financed the most with rural credit is cattle, followed by soybeans, accounting for 20 percent and 19 percent of the total rural credit volume, respectively. Cattle ranching and soybean expansion are also the major drivers of deforestation.

11. **Credit is mostly short-term for working capital financing.** About 58 percent of rural credit extended in 2017 was for working capital (custeio), which has an average maturity of one year, and only 22 percent of the loan volume was for longer-term investment loans. In 2017, half of all loans had a maturity of less than 1 year, and only 20 percent had a maturity of more than five years. Less than 1.5 percent of all loans had a maturity of more than 10 years. Over the past five years, the volume weighted maturity of loans declined from 35.6 months to 28.5 months.

12. **Longer-term investment loans are increasingly needed for sustainable agriculture.** Technologies like, zero tillage crop production, pasture renewal and recovery, integrated production (crops, pasture and forestry) and commercial forest planting will require capital investments and long-term financing.

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15 Farms are defined as small, if the cultivated area is below 800ha and the value below R$ 360,000; medium if the area is between 800ha and 3000ha and the value between R$ 360,000 and R$ 1,760,000. Large farms have an area of more than 3000ha and a value of more than R$ 1,760,000.

16 Combining the largest five products, soybeans, cattle, corn, coffee and sugar, receive 56 percent of the rural credit volume.

17 The un-weighted average maturity declined from 52.8 months in 2013 to 34.9 months in 2017.

18 (i) Zero tillage is a farming system in which the seeds are directly deposited into untilled soil which has retained the previous crop residues as mulch, it is not a simple technology and requires in-depth knowledge and as well as capital; (ii) Pasture renewal and recovery (there are several techniques of pasture recovery and renewal – the rancher has to decide on the production system after recovery or renewal, carry out a thorough diagnostic of the soil, climate and production system and have a good understanding of the production history of the area); (iii) integrated production - the technology consists in the diversification and integration of the various production systems, agriculture, livestock and forestry, within the same area through intercropping, in succession or rotation of so that there are benefits for all activities; (iv) the replacement of pasture or agricultural land by planted forest is a simple technology that requires, at least at the outset, substantial capital and labor for planting. The first harvest is normally after seven years.
FIGURE 4: CREDIT BY INSTRUMENT AND PRODUCT

Source: Banco Central do Brasil
Note: In the right hand panel the largest others products are: coffee, sugar, rice, tractors, wheat, poultry, other machines and cotton.

FIGURE 5: LENDING BY BANK TYPE (2017)

Source: Central Bank of Brazil – Sicor/Agriculture and Livestock Annual Plans

13. **Rural credit is primarily distributed by public banks.** In 2017, nearly 71 percent of all rural credit contracts were financed by public banks, representing 55 percent of the total volume of rural credit. The market share of public banks is particularly large for small and medium-sized farms. Public banks account for more than 60 percent of the total loan volume for small farms and 80 percent for medium sized farms. In 2017, they provided 84 percent of all small loans with a volume of less than R$10,000. Public banks have the largest market share in the North and Northeast, where they account for more than three-quarters of the total lending volumes. In contrast, their market share is less than 50 percent in the Southeast. Among the public banks, *Banco do Brasil* dominates the rural credit market,

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19 Banco do Brasil, Banco do Nordeste, Banco da Amazonas, Caixa Economica Federal, as well as BNDES.
with a market share of 46 percent in 2017\textsuperscript{20}. Loans extended by public banks also have the highest average maturity (45 months).

14. **Public banks also concentrate a significant portion of their lending portfolio into a small number of corporate loans.** For example, while 5.4 percent of public banks credit contracts are corporate loans, these represent close to 36 percent of the total loan volume. In 2017, the average loan from public banks to firms was R$1.5 million, almost four times the average loan from private banks to corporate clients (R$415,000). The concentration of lending in the public sector is striking. In fact, 80% of the total corporate loan volume from public banks in that year can be attributed to 153 firms. Moreover, some credit contracts by public banks are particularly large, comparable in size to bond issuances from non-financial firms in the country.\textsuperscript{21}

![FIGURE 6: AVERAGE LOAN SIZE](image)

**Loans to individuals**

<table>
<thead>
<tr>
<th>Year</th>
<th>Private Banks</th>
<th>Public Banks</th>
<th>Credit Cooperatives</th>
</tr>
</thead>
<tbody>
<tr>
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<td>37</td>
<td>66</td>
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<tr>
<td>2017</td>
<td>164</td>
<td>91</td>
<td>164</td>
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</table>

**Loans to firms**

<table>
<thead>
<tr>
<th>Year</th>
<th>Private Banks</th>
<th>Public Banks</th>
<th>Credit Cooperatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>500</td>
<td>720</td>
<td>500</td>
</tr>
<tr>
<td>2014</td>
<td>1050</td>
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<td>1050</td>
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<tr>
<td>2015</td>
<td>1400</td>
<td>1850</td>
<td>1400</td>
</tr>
<tr>
<td>2016</td>
<td>1550</td>
<td>2070</td>
<td>1550</td>
</tr>
<tr>
<td>2017</td>
<td>2000</td>
<td>2930</td>
<td>2000</td>
</tr>
</tbody>
</table>

Source: Central Bank of Brazil

15. **Most rural lending throughout the period of 2013-2018 focused on farmers with higher income:** 50 percent of loan contracts targeted individuals with a monthly income above 10 minimum wages, and this group accounted for 67 percent of the total loan volume to individuals. Individuals receiving earmarked credit from public banks have higher income than earmarked recipients from private banks.

16. **Most firm clients from public banks also have existing credit relationships with private banks.** For instance, 79 percent of firms receiving loans from a public bank, also have outstanding credit contracts with private financial institutions. Most individual borrowers in the rural sector on the other hand, only have credit relation with a single bank. For example, 91 percent of individual farmers that have an established credit relationship with a public bank do not receive commercial credit from private banks. Similarly, 95 percent of individuals receiving credit from a credit cooperative, have no additional sources of commercial credit. The evidence highlights two contrasting facts about rural

\textsuperscript{20} BdB’s market share is especially high in the South and Southeast, whereas in the North and Northeast regions, Banco da Amazônia and Banco do Nordeste are the main suppliers of credit.

\textsuperscript{21} During 2017, 32 firms receive rural credit from public banks with loan amounts that exceeded the median value of corporate bond issuances that year (i.e., R$120 million per issuance).
lending: while firms in the rural sector have multiple sources of financing through several bank relations, individual farmers seem to have more limited alternatives to access commercial credit.

**FIGURE 7: DISTRIBUTION OF LOANS BY FARM INCOME**

Source: Banco Central do Brasil.

Notes: Loans to family-owned farms.

17. **Private banks account for 8 percent of loan contracts and about 30 percent of total rural credit.** The portfolio of rural loans by private banks is disproportionately allocated to larger and more established clients, not only because of lower administrative costs, but also because these borrowers are perceived as “lower-risk” than small farms. Private banks account for 54 percent of all loans to large farms and only 16 percent of loans to small farmers. The market share of private banks is highest in the Southeast, where they represent 38 percent of total lending in 2017.

18. **Credit cooperatives, which typically serve smaller clients, represent 21 percent of contracts, but account for less than 15 percent of the loan volume.** Credit cooperatives are an important source of credit for small farms. They are predominantly active in the South and Southeast, which are home to 80 percent of all credit cooperatives in Brazil, and together receive 75 percent of credit cooperatives’ lending. In 2017 they provided 22 percent of loan volume to small farms.

4 **Public Policies and Supply of Financial Services**

19. **The overall level of subsidies granted by Brazil to agriculture is lower than in peer countries and focused on rural credit.** Subsidies in Brazil amount to only 3 percent of the total value of agricultural production are thus substantially lower than in most OECD countries and other major agricultural producers (see Figure 8). Brazil’s agricultural policy is based on two policy instruments. The first and most important aims to support the rural credit system for commercial and family farmers; and the second aims to contribute to a better mitigation of risks through insurance programs and price support for some agricultural products. For government programs, farmers are segmented into two

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22 See Annex 1 for more details. In addition, the envisioned demand access to finance survey of a sample of farmers under an agriculture project was not undertaken, so the Note has not been able to illustrate findings on the demand side.
groups: family farms and commercial farms (medium and large sized farms). Depending on the segment, farmers are subject to a differentiated level of support in accessing financing and risk management instruments, based on a yearly allocation of resources, during a process coordinated by the Ministry of Finance, Agriculture, and Central Bank, that outlines amounts, interest rates, financing limits, and all the norms applicable to rural finance.

**FIGURE 8: INTERNATIONAL COMPARISON OF TOTAL PUBLIC SUBSIDIES FOR AGRICULTURE AND LIVESTOCK**

![International comparison of total public subsidies for agriculture and livestock](image)

Source: FAO and OECD

### 4.1.1 Public lending policies and programs

20. **Public policies related to agricultural credit aim mainly to enhance the performance of the agricultural sector and do not include objectives related to the financial sector.** The main objectives of the *National Rural Credit System (SNCR)* relate to improved production, productivity, investment, income enhancement and improving standards of living of the rural population. There are no explicit objectives linking these policies to financial sector objectives of stability and inclusion.

21. **Policies related to agricultural lending involve a complex set of rules and actors.** Such policies regulate: the sources of funding that must be applied to finance agriculture, the financial sector entities that have access to the different programs, the programs themselves, and their beneficiaries.

**Rural credit funding sources**

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23 The subsidies are measured through the ratio of Total Support Equivalent, TSE, divided by the value added of agricultural production.

22. Mandatory lending quotas constitute the largest share of funding for agricultural lending within the SNCR. These quotas include compulsory resources ( recursos obrigatorios) and rural savings ( poupanca rural), and are based on percentage of current account deposits and rural savings accounts that have to be used for rural lending at pre-determined rates. Resources coming from lending quotas accounted for 59 percent of total funding within the SNCR in 2017. Other important public funding sources are resources provided by BNDES/FINAME for special programs, as well as by constitutional funds (Figure 9).

![Figure 9: SNCR: Rural Credit Funding Sources (% of disbursed amounts)](image)

Source: SEAD, MAPA, Agriculture and Livestock Annual Plans

23. Market-based instruments, such as agricultural credit notes (LCAs), have become the main source of market financing for commercial agriculture, mainly due to tax exemptions for individuals. While funding from compulsory resources and BNDES/FINAME has been decreasing steadily since 2013, the use of commercial instruments, such as the Agricultural Credit Lines (Letra de Credito do Agronegocio - LCA24) has gained importance. Individuals are exempt from taxes for the income they make from investments in agricultural financial instruments, which reduces the interest rate of LCAs. While it increases the availability of financing for commercial agriculture, this form of tax exemption also has distortive effects for other instruments.

Rural credit programs25

24. The complexity and fragmentation of policies by funding source and programs creates a highly unclear market in which the conditions of loans can vary significantly for similar farmers, depending on various factors. These factors include, location (which is a determinant for some funding sources such as the constitutional funds), the size of the farm (with diverging criteria for PRONAF, depending on the regional definition of the size of the fiscal modules), income (with diverging criteria of the

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24 LCAs are backed by a variety of instruments such as Banking Credit Notes (CCB) (higher volume), Certificate of Agribusiness Credit Rights (CDCA), Rural Product Note (CPR), Rural Pledging Instrument (CRP), and Agribusiness Credit Receivable Certificates (CRA), by which farmers obtain funding pledging their future crop.

25 A complete list of all programs is available in the Appendix.
maximum allowable income for the different programs), and the type of institution (with public banks and cooperatives being the only entities that have access to subsidized funding). Harmonizing and simplifying these policies could enhance market transparency and competition.

25. **The largest rural credit programs in terms of volume are PRONAF and PRONAMP, both funded primarily by rural savings and compulsory resources (Figure 9).** PRONAF, which currently has 13 sub-programs, targets small producers and family farms. It is the largest rural credit program, accounting for 35 percent of the total volume disbursed, which has been stable over the last five years. The second largest program is PRONAMP, which aims to improve financing primarily for medium-sized farms with an annual income below R$ 1.76 million. Credit under PRONAMP increased by 42 percent between 2013 and 2017, supported by an increase in the eligibility ceiling for working capital loans, which made a larger set of farms eligible for the program.

26. **MODERFROTA is the third largest rural credit program, available for larger producers.** It finances the acquisition of tractors, harvesters, and other agricultural equipment. MODERFROTA is primarily financed by BNDES/FINAME and has been growing rapidly over the last years.

27. **The ABC Program, which is the only public program to finance low-carbon agriculture in Brazil, faces limited demand.** This program is the main credit line to finance the environmental goals and technologies presented in the Brazilian Low Carbon Agricultural Plan (ABC Plan). Most recipients are medium-sized farms. Even though the ABC program has attractive conditions, it represents only a very small fraction of rural credit. The reasons for the low level of disbursement has been linked to, amongst others, difficulties in accessing markets, uninformed producers, deficient technical assistance, and a cumbersome application process, which requires evidence of climate benefits.

28. **Loans linked to a specific program follow that program’s rules concerning borrowers’ eligibility, interest rates, credit limits, destination, and other conditions.** Under most programs, interest rates are capped, with the level of the cap ranging from as low as 0.5 percent per annum under PRONAF to 11.25 percent under FUNCAFE. In addition, maturity terms vary substantially between programs.

29. **A substantial share of rural credit, while funded with mandatory sources (compulsory resources and rural savings), is not linked to a specific program.** The volume of rural credit that is not linked to a specific program increased from R$ 85 billion in 2013 to R$ 98 billion in 2017 (see Figure 10). Loans that are not linked to a specific program follow the conditions of the funding source.

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**FIGURE 10: EVOLUTION OF RURAL CREDIT BY PROGRAM**

4.1.2 Reach and Targeting of Rural Lending Policies

30. **Government programs are the primary source of rural credit, although reaching only a relatively small share of farmers.** According to the 2017 census, government programs reached about 400,000 farmers or 8 percent of all farmers. This means that government programs are the primary source of funding for farmers. Of the 780,000 farmers that had a loan in 2017 – which is only 15.5 percent of all farmers in the 2017 census – about half of farmers had this loan through a government program. The most important program in terms of reach is PRONAF, which reaches 320,000 farmers and thus accounts for three-quarters of the beneficiaries of government programs. While public support is becoming less relevant for commercial farms, the provision of financial services to family farms continues to be fully dependent on public support.

![FIGURE 11: FARMS’ ACCESS TO CREDIT BY PROGRAM](source)

Source: 2017 Census

31. **Access to credit through government programs shows large regional heterogeneities, with farmers’ lowest access to government programs in the North and Northeast.** While access to credit through...
government programs is highest in the South, where roughly 18 percent of farmers have loans through government programs, it is substantially lower in the North and Northeast, where only around 5 percent of farmers have access to loans through government programs. Across Brazil’s 5,563 municipalities, the median share of farmers that had access to a loan through government programs is 6 percent. In two-thirds of municipalities, less than 10 percent of farmers received loans through programs. There are only around 600 municipalities where government loan programs reach more than 20 percent of farmers.

FIGURE 12: PERCENTAGE OF FARMERS WITH LOANS BY REGION AND PROGRAM

Source: 2006 and 2017 Censuses

32. Farms with long-standing bank relations benefit the most from earmarked credit. Recipients of earmarked credit tend to have a longer relationship with the bank extending the credit compared to the recipients of free-credit, i.e. credit not linked to a mandatory funding source. This observation holds true for all types of financial intermediaries, but is particularly significant for public banks and credit cooperatives, where the recipients of earmarked credit have on average 3.5 years and 4.2 year longer relation with the financial institution extending the loan, compared to the recipients of non-earmarked credit. Thus, it appears that government driven lending to rural firms is, to a large extent, allocated to borrowers that have well-established credit relation with the bank.

33. Public programs increase access and reduce costs of loans for family farms. The analysis indicates that the Government’s rural credit policies have helped ease financial constraints for small firms. The provision of earmarked credit, especially through public banks, is associated with a higher probability that family farms obtain a credit. It also reduces the interest rate and extends the maturity of loans obtained for family farms compared to large farms. In contrast, non-earmarked credit family farms face a significantly lower probability than large firms to obtain a loan as well as higher costs and more stringent maturity requirements (see Annex 3).

34. While public programs appear to generate direct benefits to borrowers, there is little evidence that the presence of earmarked lending has improved access to non-earmarked credit in the rural sector. It is possible that the presence of public banks and earmarked lending in rural finance improves the availability of free-market credit to farms via informational spillovers. Such effects might arise because
once a government lending program is available, loan recipients with bankable projects can build up credit history, reducing information asymmetries with lenders. In turn, financial institutions might allocate free-market credit to borrowers that first established a credit relationship via earmarked lending. However, empirical evidence (see Annex 3) does not support this view. Instead, the analysis finds that earmarked lending is highly persistent: farms receiving earmarked loans are more likely to obtain new financing through additional earmarked credit. The evidence suggests that rather than ‘graduating’ from government-driven credit and transitioning into the free-market credit, farmers systematically rely on earmarked loans. While some farms might benefit from positive informational externalities, the lack of depth in the rural credit market implies that most farms are excluded from non-earmarked credit, even after maintaining a successful credit history within earmarked loans. Furthermore, since rural free-market credit is mostly short term, farms looking to finance long-term investments appear to rely on earmarked credit, despite a good credit history.

35. **The number of farmers obtaining credit from public programs is declining.** The number and share of loans through government programs, particularly PRONAF, has fallen substantially since the 2006 Census, reducing significantly the relevance of these programs for the target population. In contrast, the number of loans outside government programs has more than doubled over that period, cushioning the impact of fewer government program loans on the total number of borrowers. Census data show that the share of loans outside government programs is particularly high in municipalities that have a higher share of large firms (more than 100 ha), indicating that government programs are less important for large firms.

**TABLE 1: FARMS’ ACCESS TO CREDIT BY PROGRAM**

<table>
<thead>
<tr>
<th></th>
<th>2006 census</th>
<th>2017 census</th>
<th>Difference 2017 - 2006</th>
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<tr>
<td>Farmers without credit</td>
<td>4,024,743</td>
<td>4,287,050</td>
<td>262,307</td>
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<tr>
<td>Farmers with loans</td>
<td>919,116</td>
<td>784,228</td>
<td>-134,888</td>
</tr>
<tr>
<td><strong>Hereof:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- With loans outside of government programs</td>
<td>140,013</td>
<td>377,812</td>
<td>237,799</td>
</tr>
<tr>
<td>- With loans from PRONAF</td>
<td>615,592</td>
<td>319,818</td>
<td>-295,774</td>
</tr>
<tr>
<td>- With loans from PRONAMP</td>
<td>0</td>
<td>19,730</td>
<td>19,730</td>
</tr>
<tr>
<td>- With loans from other government programs</td>
<td>163,509</td>
<td>66,868</td>
<td>-96,641</td>
</tr>
</tbody>
</table>

Source: 2006 and 2017 Censuses

36. **Rural credit volumes remained stable in nominal terms, but declined in real terms and the number of contracts dropped over the last five years.** While the nominal volume of disbursed amounts has remained relatively stable in recent years with a small tendency to grow, it decreased by roughly 10 percent since 2013 in real terms. Additionally, the number of contracts has decreased by about 1.2 million (equivalent to around 40 percent of contracts). The decrease in the number of loans affected public and private banks to a similarly large extent, with both reducing their number of contracts by roughly 48 percent. In contrast, credit cooperatives increased their loan numbers by 3 percent from 2013 to 2017.

**FIGURE 13: EVOLUTION OF LOAN AMOUNTS AND NUMBER OF CONTRACTS**
37. **This evolution has increased the average amount per loan.** While the average loan size in 2013 was roughly R$ 50,000, it doubled in nominal terms to almost R$ 100,000 in 2017. In real terms, the increase in average loan size over that period was 56 percent. Average loan amounts increased the most for private banks, which more than doubled in nominal terms and increased by 64 percent in real terms. The increases were of similar magnitude for public banks, but smaller for credit cooperatives. The average loan size of credit cooperatives increased by 70 percent in nominal and 30 percent in real terms.

38. **The largest reduction in the number of loans affects loans below R$ 10,000.** The number of these small loans dropped by about 1 million contracts (or by 56 percent) over the last five years. In addition, the number of loans between R$ 10k and R$ 100k decreased. In contrast, the number of very large loans of more than R$ 1 million increased from 11,000 in 2013 to 18,000 in 2017, and also the number of loans between R$ 100k and R$ 1 million increased slightly. Some of the changes can be explained by rising price levels, i.e. in order to obtain the same real value of a loan in 2017 than in 2013, the nominal size of the loan would have to increase by roughly 30 percent. However, even after accounting for this and looking at the real loan values, a large drop in the number of small loans is observable (see Figure 14).

39. **Several reasons may explain the sharp drop in lending to small farmers.** Financial institutions’ lack of profitability in lending to this segment is likely a relevant reason. One of the reasons for the significant decrease in the number of small loans as well as of family farmers is that subsidies are granted as a percentage of the outstanding loan amounts, thus the subsidy amounts paid for smaller loans are also smaller than those paid for larger loans. The total income (margin plus subsidy) in the case of loans below R$10,000 may not cover the minimum administrative costs that must be born to adequately manage these loans and that are independent of loan size. This issue is worth exploring further by assessing the costs and income generated by small PRONAF loans to determine their profitability for different financial entities.

**FIGURE 14: EVOLUTION IN NUMBER AND VOLUME OF CONTRACTS**
Notes: Real loan number deflates the nominal loan volume by the CPI index and the groups the loans in the respective size brackets. Source: Banco Central do Brazil

4.1.3 Distortions of Rural Lending Policies and International Experience

40. The costs of rural lending policies and programs are borne by the fiscal sector, savers, and financial intermediaries. The subsidies, tax exemptions, lending quotas and interest rate caps applied as part of the rural lending policies have direct and indirect fiscal costs, reduce the remuneration for savers, and affect the efficient allocation of capital of the financial sector.

Fiscal costs

41. The fiscal costs from the rural credit market policies can be separated into direct and indirect components. Explicit subsidies (subsídios explícitos) refer to actual disbursements made through equalization of interest and prices, as well as direct expenditures by the government, whose allocation of funds is annually decided by the parliament. This type of subsidy, in general, affects primary expenditure and is subject to the limits of the Constitutional Amendment of the expenditure ceiling. On the other hand, implicit subsidies (subsídios implícitos) are the expenses derived from official credit programs. They are called implicit subsidies as they are not allocated based on the annual budget process and do not appear in the federal budget. Implicit subsidies are resources that the National Treasury (NT) allocates to funds or programs at interest rates below its own cost of funding.²⁷

- **Direct federal subsidies/Interest rate equalization.** The on-budget federal subsidies, referred to as interest rate equalization, are intended to compensate lenders for providing loans below market rates under several government programs. The subsidy compensates lenders for the difference between the cost of funds and the capped on-lending rate in addition to allowable administrative costs. The largest direct subsidy goes to PRONAF. In 2017 the cost of interest rate equalization under PRONAF was R$ 4.1 billion, or roughly one-third of all direct subsidies. These

subsidies exclusively benefit family farms, which are the only eligible borrowers under PRONAF. The National Treasury also budgeted R$ 2 billion for equalization of agricultural extension and R$ 2.1 billion for equalization of rural and agroindustrial investments and R$ 0.1 billion for Fund for the defense of the coffee industry. Direct fiscal costs also include subsidies for rural insurance premiums as well as price support policies (see Section 4.2 for more details), but they account for less than 10 percent of the total direct fiscal costs.

- **Constitutional Funds.** Funding for agriculture is also provided from Constitutional Funds, including the Northeast Fund (FNE), the North Fund (FNO) and Midwest Fund (FCO). In 2017 the costs of the agricultural support provided by the constitutional funds reached R$ 5.95 billion. The agriculture sector is the largest recipient of constitutional funds and received around 45 percent of the total support provided by the three funds. Over the last years the constitutional funds have been the largest single cost category among the agricultural support programs. The constitutional funds present indirect subsidies as they do not appear in the federal budget and are not subject to parliament approval or expenditure limits.

- **Implicit subsidies via BNDES funding.** Implicit fiscal subsidies arise from the fact that in order to finance BNDES programs, the government issues public debt at market rates and lends to BNDES at subsidized rates. In 2017 the total fiscal costs of this amounted to R$ 15.6 billion. As agriculture received 20 percent (R$ 14.3 billion) of total BNDES disbursements in that year the implicit fiscal costs of its support to the sector were around R$ 3.2 billion. The introduction of the TLP as the new interest rates for BNDES in September 2017 is set to reduce the implicit subsidies going forward.

- **Forgone fiscal revenues from tax exemptions.** Another indirect fiscal cost stems from forgone fiscal revenues due to the fact that rural savings deposits (rural poupanças) and agricultural credit letters (LCA) are exempt from the 15 percent tax on interest income. Forgone tax revenues are estimated to be around R$ 3.0 billion (R$ 1.5 billion from the forgone taxes on saving deposit interest rates and R$ 1.5 billion from forgone taxes on LCA returns).\(^28\)

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\(^28\) Following Pazarbasioglu et al. (2017) forgone tax revenues are calculated by multiplying the outstanding amount of rural savings deposits (R$ 160bn) and LCAs (R$ 143bn) times their average returns, 6.2% for rural savings deposits and the CDI rate for LCA, and by the 15% interest income tax.
The total, direct and indirect, fiscal costs of the agricultural support programs reached R$ 22.7 billion or 0.35 percent of GDP in 2017. Agricultural subsidies account for slightly more than one-quarter of all subsidies (for beneficios financeiros e crediticos) paid in 2017. The total is roughly equally split between direct and indirect subsidies. Direct agricultural subsidies of R$ 11.1 billion accounted for around 0.9 percent of total fiscal expenditures in 2017. In nominal terms, the total fiscal costs in 2017 were roughly 25 percent below the costs of the previous year, and also in relation to GDP the fiscal costs of the agricultural support programs have declined over the last years.

The costs of agricultural support programs are very sensitive to market interest rate movements and are procyclical. Regulated rates are more stable than market rates and hence higher market rates widen the gap between the Government’s borrowing costs and the rate on its lending to the financial sector. Pazarbasioglu et al. (2017) estimate that the total cost of earmarked credit grows by almost 1 percent of GDP in response to a 1 percentage point increase in sovereign funding costs. An economic shock that leads to a tightening of monetary policy and higher Government borrowing costs therefore also has an important negative impact on the fiscal sector through the earmarked credit interventions. As a corollary, it leads to procyclicality in the subsidies embedded in the directed lending because the subsidies will grow when monetary policy tightens.
Impact on savers

44. **Under-remuneration of savings and deposits.** Funding from savers via compulsory resources (*recursos obrigatórios*, consisting of 30 percent of deposits in checking accounts) and rural savings (*poupanca rural*) accounted for R$113 billion or almost two-thirds of total rural credit in 2017. The flip side of these cheap sources of funding is that savers often receive limited remuneration and constrained savings options. The interest rate on savings accounts (*poupanca*) is regulated by the Central Bank,\(^{30}\) and has usually followed the inflation rate, thus offering about zero real return. Demand deposits are not remunerated at all. The costs of these regulations born by savers can be gauged by comparing the regulated return on deposits with a counterfactual where savers would obtain the market rate (CDI). In 2015 and 2016 the difference between the average *poupanca* rate and CDI rate stood at 5.1 percentage points, suggesting a large under-remuneration of savings accounts. As market rates came down, the gap declined to an average of 0.8 percentage points in 2017 and as of September 2018, the two rates almost converged. However, under-remuneration of savings is likely to re-emerge again when markets rates rise faster than savings rates.

Implications for financial intermediation

45. **Mandatory lending quotas constrain the volume of funds that banks can lend to non-earmarked segments.** Financial intermediaries also bear costs of the rural credit policies as mandatory lending quotas channel resources to low interest activities and restrict their ability to carry out more profitable activities. In addition to the 60 percent of rural savings deposits and 30 percent of total demand deposits that have to be channeled to rural credit, 2 percent of demand deposits must be directed to microcredit and 65 percent of general savings deposits are directed to real estate financing.\(^{31}\) Furthermore, reserve requirements claim 25 percent of demand deposits (reduced in April 2018) and 20 percent of savings and rural savings deposits. This leaves only 39 percent of demand deposits, 15 percent of savings deposits, and 20 percent of rural savings deposits at banks’ discretion for lending to other sectors. Time deposits are more flexible with 66 percent of resources freely available for any type of loan. Quotas also apply to funding obtained from the issuance of agricultural letters of credit (LCAs), where 35 percent of the total amount collected must be directed to the rural sector. Banks

\(^{31}\)
that do not meet their rural lending quotas requirements have to pay a financial compensation. In 2017/18, twenty financial institutions missed their quotas and had to pay R$ 51.7 million in fines.

46. **Earmarked credit can lead to a misallocation of capital.** Recent studies conducted by the World Bank (Pazarbasioglu et al. 2017; Pedraza et al. 2019) show that the firms benefitting most from earmarked credit in Brazil were larger, older and less risky. They also find that the share of earmarked credit going to large firms has increased since 2010. Firms that received earmarked credits did not invest more, but lowered their financial expenses and reduced their leverage. Earmarked loans may have also been used for financial arbitrage. Caballero et al. (2016) find that, in face of low global interest rates, firms in countries with capital controls were issuing external bonds to finance carry-trade activities. Since firms that borrowed earmarked loans expanded indebtedness without a corresponding increase in investment, it is plausible that this leverage expansion was partly motivated by the existing opportunity of financial arbitrage, since low low-risk investment opportunities were widely available in the financial market at rates higher than those of earmarked loans (Pazarbasioglu et al. 2017). These findings hold true for rural finance, as the loan level analysis shows that both private and public banks tend to allocate earmarked credit to firms that are older, less risky, and have a longer credit relationship (see Annex 3).

47. **Banks seem to compensate the impact of capped earmarked rates on their profitability by charging higher rates on non-earmarked credit.** Although average interest rates on non-earmarked credit have declined substantially over the last two years as the Selic rate went from 14.25 percent in September 2016 to 6.5 percent in September 2018, average lending rates on new credit for non-financial firms remain high at 38 percent. Earmarked credit also strengthens bank-firm relations and increases client retention. Pedraza et al (2019) find that firms receiving earmarked loans are less likely to switch between private banks for non-earmarked credit. In turn, banks charge higher interest rates to these locked-in clients. This is more than five time the level of average earmarked rates for rural credit. International experience also suggests that banks try to circumvent interest rate caps by charging higher non-interest rate fees and engage in cross-selling or bundling of credit and non-credit instruments (Ferrari and Masetti, 2018).

48. **Interest income comes almost entirely from the non-earmarked segment.** Although earmarked loans account for roughly 46 percent of the banking system’s outstanding credit, due to the substantially lower interest rates, they generate only 16 percent of banks’ estimated interest income (see Figure 16). If interest rates were adjusted for inflation, almost the entire real income would be due to non-earmarked credit. The same holds true for earmarked rural credit. It accounts for roughly 8.2 percent of total credit, but due to the low rates, earmarked rural credit accounts only for around 1.6 percent of the estimated interest income.

49. **Within the earmarked sector, banks seem to focus on larger loans and to reduce lending to smallholder farms (loans below 10,000 R$).** In the case of PRONAF (family farms), the government provides subsidies to compensate for: a) the difference between the interest rate charged to the final borrowers and the cost of funds, and b) allowable administrative costs. The subsidy does not cover for risks under the assumption that such costs are covered in the case of the small PRONAF loans by
the Proagro and Proagro Mais programs (as discussed in the section on risk management instruments).

FIGURE 17: IMPACT OF EARMARKED CREDIT

<table>
<thead>
<tr>
<th>Earmarked vs non-earmarked lending rates*</th>
<th>Estimated interest income by segment**</th>
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<tr>
<td>01/2013 05/2013 09/2013 01/2014 05/2014 09/2014 01/2015 05/2015 09/2015 01/2016 05/2016 09/2016 01/2017 05/2017 09/2017 01/2018 05/2018 09/2018</td>
<td>Non-earmarke credit</td>
</tr>
<tr>
<td>Non-earmarke credit</td>
<td>Earmarked rural credit</td>
</tr>
<tr>
<td>0%</td>
<td>10%</td>
</tr>
</tbody>
</table>

* Blue line: Average interest rate of non-earmarked new credit operations - total; orange line: Average interest rate of earmarked new credit operations - Non-financial corporations - Rural credit - Earmarked rates - % p,y
** Interest income is estimated by multiplying the average interest rate for new loans with the outstanding credit volumes as of December 2018.
Source: Banco Central do Brasil

50. Overall, to adjust to the conditions of mandatory programs that often do not cover the full costs of intermediation, financial intermediaries use a variety of strategies to minimize the losses they incur due to such programs. On one side, financial intermediaries attempt to obtain subsidies, if available. On the other, they try to achieve profitability by cross-selling other, more profitable, products to the beneficiaries of public programs. A third strategy looks to minimize losses by serving only low-risk customers and by increasing the average size of loans (e.g. by not granting very small loans). A fourth strategy consists on channeling obligatory resources to other financial entities at a low cost or, lastly, by depositing the funds at the Central Bank.

Other costs

51. The regulated interest rates associated with earmarked lending suppress the effectiveness of monetary policy. Because the supply of earmarked credit and interest rates are regulated, that part of the credit market does not respond as well to monetary policy. Estimates show that if earmarked loans responded to changes in the SELIC policy rate in the same way as non-earmarked loans, an increase of 0.84 percent would have the same effect as the current effect of a 1 percent SELIC increase. As a consequence, changes in the SELIC rate must be larger to achieve monetary policy objectives (Byskov, 2017).

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32 See Pazarbasioglu et al. (2017) and Bonomo et al. (2017).
In addition, agricultural loans have been subject to a variety of loan rescheduling / loan forgiveness measure that have had mixed effects on the market and whose total costs have not been quantified. Since 1995, a total of 16 of such measures have been approved by the Brazilian Congress \(^{33}\) through laws that indicate how the process of renegotiation or debt forgiveness will be carried out depending on the source of financing, the program, the beneficiaries, and how much of a discount or rebate will be granted, among other factors. With the argument that those renegotiations attend special circumstances not covered by risk-management instruments described in the next sub-section, such laws set the framework for borrowers to renegotiate their debts directly with the financial institutions. These measures may respond to political pressure combined with insufficient information about the roots of default. \(^{34}\) In addition, these programs also limit demand for more adequate and sustainable risk management instruments, such as insurance, which become less relevant under the current scenario.

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### BOX 1: LAW 13.340 FROM 2016

This recent law allows for the forgiveness or renegotiation of loans granted before December 2011, covering up to 95 percent of the outstanding loan amount. Rescheduled loans will charge an interest rate between 0.5 percent and 5 percent per annum (depending on the type of borrower) and repayments will begin in 2021 and will be completed by November 2030. The total fiscal cost of this law is expected reach R$ 4 billion.

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\(^{33}\) See Annex 5.

\(^{34}\) E.g. Tavora (2014). Both public and private banks are required by the Reserve Bank of India to offer 40 percent of their loans to ‘priority sectors’, which are small value loans to farmers for agriculture and allied activities, micro and small enterprises \(^{34}\), poor people for housing, students for education, other low income groups and weaker sections. \(^{34}\) Interest rates are freely set, but the dominance of public banks may lead to lower rates as these banks pursue social and economic development objectives. \(^{21}\) Banks that fail to achieve the lending target of at least 40 percent of their adjusted net bank credit to the ‘priority sectors’, are required to lend money to specific government agencies at very low rates of interest. \(^{34}\)
Box 2. International experience with mandatory lending quotas and interest rate caps

International experience suggests that mandatory credit quotas are effective at channeling credit to specific sectors, but may not benefit the poorest segments (e.g. lack of targeting) and may increase the costs of access to credit. Analysis conducted in India has shown that only 14 percent of marginal farmers (with plots smaller than 1ha) were taking institutional credit in 2009 with the remaining largely relying on moneylenders. Indeed, banks are reluctant to lend to farmers who have collateral and have small farms, and therefore focus their lending on more commercial farmers. Similarly, analysis conducted in Bolivia has shown that three years after the approval of the credit quota law, financial institutions had grown larger-size loans instead of SMEs and micro loans in order to meet the allocation target to productive sectors. Indeed, in 2014, aggregated lending portfolio from banks, showed a 180 percent increase in corporate loans compared to a 12 percent decrease in SME loans and a 11 percent increase (compared to a 21 percent increase in 2013).

Beyond the challenge of targeting, mandatory quotas might increase the cost of access to credit both for targeted and non-targeted segments. Mandatory lending can generate costs for financial institutions either directly (requiring to target a segment that is not as profitable as other segments), or indirectly (imposing a penalty on financial institutions that do not comply). Such increased costs may be transferred to customers in the form of higher interest rates or fees.

In addition, despite good policy intentions, international experience indicates that banks have often experienced declining asset quality in priority sectors as they aggressively expanded credit to meet quotas. It is particularly the case when lenders lack the experience and the ability to assess risks in priority sectors. For instance, Indian banks have suffered declining asset quality in agriculture and SME portfolios as they aggressively expanded credit to these sectors to meet the lending quotas over the period 2001-2013. Analysis showed that priority sector loans had higher share of NPLs than other sectors in particular for SMEs (8.9 percent of total credit, but 15.1 percent of NPLs) and agriculture (11.4 percent of total credit but 14.1 percent of NPL). In Brazil, the agriculture sector has not experienced a rise in NPLs, but stakeholders have also reported significant restructuring of agriculture loans that may keep NPLs down. Lending to agriculture under the different programs has resulted in reportedly lower levels of default than lending to other economic sectors, especially in the case of the loan portfolios that are granted to individuals at subsidized rates (which is the larger part of the loan portfolio). While continuous access to loans at subsidized rates may be a factor explaining this situation, it must also be considered, that all loans granted in the context of PRONAF also count on the coverage of the Proagro program that pays off the loans in case of climatic events as well as of some pests and diseases.

While the rationale for interest rate caps is to allow greater access to finance at affordable rates for underserved segments, such caps often reduce the availability of financing for the targeted segments. While interest rate caps may indeed push lenders to become more efficient in some countries where competition among financial institutions is low, and although interest rate caps are still widely used worldwide, several countries (i.e. Zambia) have started to dismantle such systems given their cost for market participants and, also, their negative effects on the supply of lending to small and marginal clients, as the cases of India and Kenya show.
4.2 Risk management instruments

4.2.1 Production risk management instruments: insurance, quasi-insurance and income compensation programs

50. The Brazilian authorities promote the supply and use of agricultural insurance and other risk management products through the subsidizations of insurance premiums; and the financing of quasi-insurance and direct income compensation programs.\textsuperscript{35} The support is provided through six public programs (see Table 2).

51. These risk management programs face important challenges that limit the authorities from implementing a comprehensive risk management and cost-effective risk financing approach. The lack of integration of all different programs results in duplication of efforts and unnecessary use of resources.\textsuperscript{36} In addition, the lack of long-term, high-spatial resolution of information (i.e. production data, soil data, land use maps, etc.) makes it difficult for both public and private institutions to accurately assess agricultural risks. This situation also hinders the ability of stakeholders to adequately foresee\textsuperscript{37} the fiscal cost of each program, thus impacting decision-making for investing.

\begin{table}[h]
\centering
\begin{tabular}{|l|l|}
\hline
\textbf{Program} & \textbf{Description} \\
\hline
PSR (Government Premium Subsidies Program for Agricultural Insurance) & Provides a partial subsidy to the premiums\textsuperscript{38} that medium sized and larger farms pay for commercial insurance for agriculture. It is administered by MAPA. \\
\hline
\textbf{Proagro and Proagro Mais} & These two programs, administered by the Central Bank of Brazil and linked to credit, were designed to cover a share of farmers’ expected revenue and their financial liability, in case their payment capability is drastically reduced due to the occurrence of an extreme event (Proagro for small / medium-sized farms and Proagro Mais for the smaller segment). In both programs, the Government covers the difference between the premiums collected from farmers and the total amounts paid out. The Proagro program also has some overlap with the PSR program in terms of the type of farmers served. \\
\hline
\end{tabular}
\end{table}

\textsuperscript{35} Additionally the Government took important steps to i) the development of a coherent legal framework and institutional framework for agricultural insurance; ii) the design and establishment of agro-meteorological\textsuperscript{35} and agricultural statistics information systems; iii) the financing of scientific research in agriculture through EMBRAPA and other entities;

\textsuperscript{36} A detailed analysis of the main shortcomings can be found at Arias et al., 2016

\textsuperscript{37} With exception of the PSR, the other programs are also not under the supervision of SUSEP.

\textsuperscript{38} The subsidies are capped at R$ 72,000 / farmer for grains and R$ 144,000 / farmer for other crops; the average premium is R$12,000 to R$ 14,000 / farmer.
<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Garantia Safra</strong></td>
<td>This an income compensation program managed by SEAF, that provides an income support of R$ 850 to family farmers who experienced severe crop losses (50 percent or more of the expected yield of eligible crops) due to extreme drought and excess of rainfall events in the Northeast of the country. The Garantia Safra Fund is made up of financial contributions from different stakeholders, including farmers, the municipality, the state and the federal government.</td>
</tr>
<tr>
<td><strong>Bolsa Estiagem</strong></td>
<td>A catastrophic income support program that provides up to R$ 400 (distributed in five instalments) to smallholder farmers in the Northeast of Brazil, who are not covered by Garantia Safra, fully paid for by the national and local governments.</td>
</tr>
<tr>
<td><strong>Crop Insurance Stabilization Fund (FESR)</strong></td>
<td>This a reserve fund which offers stop loss re-insurance to local insurance and reinsurance companies, who must contribute to the fund 30 percent of the annual profits for the major classes it covers, and 50 percent for those involving guarantees from public or private financial institutions.</td>
</tr>
</tbody>
</table>

**PSR**

52. **The provision of insurance premium subsidies has promoted the expansion of the commercial agricultural insurance market in Brazil.** In 2016, MAPA allocated around US$ 107 million to subsidize between 35 percent to 45 percent of the premium, resulting overall in 6.4 million hectares or 10 percent of the total cultivated area being insured. In 2018, the government announced an increase in the amount of its subsidy program to US$ 168 million, a situation that reflects the government’s interest to correct market failures in the local insurance market. Furthermore, there is interest from the government in the use of premium subsidies for setting the foundations for market innovation (e.g.: making use of satellite imagery) and for designing an affordable protection for farmers.

53. **Insurance remains concentrated in a few grains, in the South of Brazil, and the market is dominated by three providers.** Soybean producers present the largest number of beneficiaries as well as premiums, accounting for 43 percent of the total, followed by corn producers in 2018. Combined, all grains account for over three-quarters of total premiums. In terms of regional distribution, premiums are highest in the South and Center-West, while very low in the North and North-East. The Southern state of Rio Grande do Sul alone accounts for almost 20 percent of total premiums in 2018. The top 3 insurance companies have a market share of almost 60 percent. The largest providers of rural insurance are Aliança do Brasil, Essor, and Sancor. These three companies combined accounted for 57 percent of total premiums and 53 percent of beneficiaries in 2018.
Agriculture insurance rates vary according to different factors, including the geographical area of the risk, the crop insured, the crop season, the level of cover selected and the historical performance of the portfolio. In Brazil, the rate of agriculture insurance ranges from 1 percent to 6 percent of the sum insured for main-season crops (i.e. soybean, coffee and sugar cane), and it could be as high as 15 percent for second-crops (corn and wheat). In Colombia, for instance, rates are in a range as wide as 2.5 percent to 12 percent. Perennial crops enjoy the lower end of the range, whereas annual crops (i.e., cereals, tubers) the higher end. In contrast, the rates for the parametric insurance scheme in India range from 1.5 percent to 2 percent of the sum insured. For the case of India, however, it is worth mentioning that the Agriculture Insurance Company (AIC) uses actuarial methods of rate-making whenever possible under the Comprehensive Crop Insurance Scheme.
### TABLE 3: INTERNATIONAL COMPARISON OF AGRICULTURAL INSURANCE PROGRAMS

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>China</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average farm size</strong></td>
<td>6.5 ha</td>
<td>0.6 ha</td>
<td>1.3 ha</td>
</tr>
<tr>
<td><strong>Current scheme</strong></td>
<td>Programa de Subvenção ao Prêmio do Seguro Rural Privado (PSR)</td>
<td>Government Subsidized Agriculture Insurance</td>
<td>– Pradhan Mantri Fasal Bima Yojana: Prime Minister Crop Insurance Scheme (PMFBY); – Revised Weather based Insurance scheme (RWBCIS)</td>
</tr>
<tr>
<td><strong>Launch of programme</strong></td>
<td>2003, operational since 2006</td>
<td>2006</td>
<td>2015/16</td>
</tr>
</tbody>
</table>
| **Main products**      | – Multi-Peri Yield Insurance (MPCI): based on the average yield of the last five years from official statistics or farmers
– Nomination risks
– Crop revenue | Multi-Peri Yield Insurance (MPCI), based on the farm-level yield. | Multi-Peri Yield Insurance (MPCI), based on the area-yield index |
| **Agricultural premiums*** | 2006: US $88.3 million
2016: US $56.3 billion | 2015/16: US $850 million
2016/17: US $3.3 billion |
| **Area insured**       | 2016: ha 6.4 million (approx. 10% of plantable area) | 2016: ha 115 million (75% of cultivated land) | 2016/17: ha 57 million (approx. 30% of gross cropped area (GCA)) |
| **Farmers insured**    | 2016: 40,000 | 2017: 213 million | 2016/17: 57.2 million |
| **Subsidies**          | – 35% – 45% of premiums paid by Federal government. Rest by the farmer, depending on the crop
– Some States offer additional subsidies of up to 50% | Central government subsidises 40% of premiums, provincial government 25%, county 15%, the remaining 20% of insurance premiums are covered by farmers (depending on crop and province) | Farmer pays 2% of premiums for Kharchi crops, 1.5% for Rabi crops and 5% for annual commercial/horticultural crops. Central and State government share the remainder 50:50 |
| **Coverage level**     | Average 65% of yield | Sum insured per farmer at about 75% – 99% of direct production cost or at about 30% – 40% of total product cost | Indemnity level: 70%, 80%, 90% of sum insured |

* In Brazil agricultural premiums (Seguro rural) include life and pledge insurance targeted at farmers. Also in China, agricultural premiums include property products (for buildings, machinery, infrastructure) geared towards the agricultural sector.

**Source:** AXA, Agricultural Insurance Survey 2018.

55. **Agriculture insurance is a highly specialized non-life insurance scheme.** Therefore, it is not by chance that the operation of the PSR program in Brazil is concentrated in a few companies. In an attempt to promote the entry of new insurance companies to the market, the PSR program changed the method by which the subsidies are assigned to the different insurers in such a way that insurance companies bid for the farmers who register with MAPA, who can choose the participating insurance company that best fits their needs. The new form of subsidization has resulted in a trend of decreasing market concentration.

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56. **The provision of premium subsidies is a common agricultural insurance market development strategy applied by many countries** and a pillar of support for producers. A survey addressed to 65 countries found that agricultural insurance premium subsidies cost governments US$ 6.6 billion in 2007. The largest cumulative increases of costs on public budgetary support on that matter were led by China and India since 2005. For instance, the governments of India and China devoted US$ 2.3 billion and US$ 1.5 billion to insure 115 million hectares and 57 million hectares, respectively, in 2016 (see Table 6). In Brazil, the premium volume has also grown significantly since the PSR program became operational in 2006, moving from US$ 90 million to US$ 1.1 billion over a twelve-year period (2006-2017).

57. **Premium subsidies programs are representing a fiscal burden for some governments in the region.** In Mexico, the subsidy to the commercial insurance premiums is the main instrument of support to the agriculture insurance market. Given that levels of government subsidies for commercial farmers have increased significantly, moving from levels of 32 percent in 2001 to over 60 percent in 2011, the government is considering whether it is feasible to reduce subsidies and still improve risk management, or whether it should be considered as an additional measure of income transfer for farmers.

**PROAGRO and PROAGRO Mais**

58. **The general agriculture quasi-insurance multi-peril programs (PROAGRO and PROAGRO Mais), offer eligible farmers an insurance covering working capital loans for crops against a variety of risks.** In addition, the Proagro Mais program, which is mandatory for loans granted to smaller PRONAF farmers, offers also an indemnity for part of a farmer’s own resources invested in the production in the cases of covered loss. Most of the resources allocated by these two programs have been directed to the Southern region and to grains (mainly soybeans). In both programs, financial institutions act as program agents, taking over the underwriting of policies and the processing of claims, which are presented individually by each affected farmer. While this form of processing contributes to agile processes, the processing and verification of individual claims is costly, and the processing of insurance claims by the lender can result in a conflict of interest that needs to be addressed. Currently, only public banks and the cooperatives operate these programs, since they account for most of the financing of loans of up to R$ 300,000 covered by PROAGRO. In recent years, these programs show a decreasing trend in the number of contracts and area covered.

**TABLE 4: PROAGRO - MAIN FIGURES**

<table>
<thead>
<tr>
<th>Crop year</th>
<th>Number of contracts</th>
<th>Value of access (R$ 1,000)</th>
<th>Accessions Average value (R$)</th>
<th>Value of indemnities (R$ 1,000)</th>
<th>Insured area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013-14</td>
<td>472,369</td>
<td>11,110,862</td>
<td>23.52</td>
<td>946,857</td>
<td>6,441,598</td>
</tr>
<tr>
<td>2014-15</td>
<td>445,200</td>
<td>12,406,169</td>
<td>27.87</td>
<td>801,235</td>
<td>7,131,133</td>
</tr>
<tr>
<td>2015-16</td>
<td>391,030</td>
<td>13,281,507</td>
<td>33.97</td>
<td>764,368</td>
<td>6,110,677</td>
</tr>
<tr>
<td>2016-17</td>
<td>372,792</td>
<td>14,768,918</td>
<td>39.62</td>
<td>152,479*</td>
<td>5,674,651</td>
</tr>
</tbody>
</table>

Source: Central Bank of Brazil; (*) in progress.

40 Further details on the costs of public sector agricultural insurance interventions is described at Mahul and Stutley, 2010.
Insurance for catastrophic events

59. **Brazil does not yet count on a risk financing strategy that combines a series of financial instruments and budgeting mechanisms to cover the need of assisting and compensating farmers, particularly family farmers, who are affected by a disaster.** This strategy should provide the most cost-effective arrangement of risk financing instruments based on the probability of occurrence and the severity of hazards (risk layered approach). In Brazil, the main existing initiatives to address catastrophic events include:

- **The two other quasi-insurance programs (Garantía Safra, GS and Bolsa Estiagem, BE) that serve the poorer farmers of the country:** GS and BE are two similar programs that focus on family farmers in Northeast of Brazil. The main feature of these programs is that the government retains 100% of the loss.
- **In addition to this, the 2010 law covering the FESR foresees that this fund will be replaced by a fund for catastrophes.** As the catastrophic fund is not yet operational, the FESR continues to provide participating insurers a stop loss reinsurance protection. This fund was depleted in 2000 following severe losses and is not used by most insurers.

60. **In order to address the issues surrounding the provision of financial coverage of farmers against agricultural risks, the government set up in January 2018 an inter-ministerial working group (Grupo de Trabalho Interministerial).** While this is a positive step, the group concentrated concentrating its efforts on the Proagro, PSR and FESR programs, leaving out other related public efforts (Garantia Safra, and Bolsa Estiagem) to deal with the provision of aid to those farmers who do not have access to commercial insurance products. Furthermore, the working group is not currently addressing programs that manage price risks.

4.2.2 Price risk management instruments

61. **Price support instruments were introduced in Brazil during the 1960s, at a time, when the economy was closed, to ensure the food supply of the Brazilian society by granting farmers minimum prices for their production, especially for staples.** During the 1970s and 1980s, the Guaranteed Minimum Price Policy (PGPM) became the mainstay of agricultural policy.

62. **Currently, there are two types of minimum price support programs:** (1) programs based on federal government purchases with guaranteed prices (instruments under which the product ends up in the government stocks); and (2) programs oriented to support market prices through direct subsidies, also based on guaranteed prices but without direct acquisition by the government.42

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41 The working group involves the Ministries of Agriculture, Finance and Economic Policy as well as the Secretariat for Family Agriculture.

42 Programs include the price compensation paid to the Producer (PEPRO—Prêmio EQUALizador Pago ao Produtor); and the Soybean price compensation (PESoja—Prêmio de Equalização da Soja). Another program, the PGPAF (Programa de Garantia de Preços da Agricultura Familiar) provides a minimum price guarantee to family farms. Access to this program is automatic for producers that take PRONAF loans. When the market price of the financed product is below the costs of production, or the minimum guaranteed price defined in the PGPM, financial institutions must give a discount for working capital and investment financing contracted under PRONAF.
63. Despite efforts to maintain minimum prices, agricultural prices have largely been liberalized, and market price support is provided under the PGPM only to a smaller extent, targeting mainly smallholder farmers in some regions.\(^{43}\) The minimum price programs now amount to a limited system of ad hoc interventions made in response to market “emergencies”. It is contingent on the availability of central funds. In general, payments are confined to domestic staples (rice and beans, maize, wheat and cassava), where the main beneficiaries are semi-commercial farmers with a marketable surplus.

64. In the case of the subsidies to fees of options contracts, the government guarantees a certain reference price for the producer without incurring additional costs if prices drop, thus providing fiscal certainty. Option contracts are auctioned at the start of the crop season and the level of subsidies tend to be lower if the auction is competitive. The mechanism guarantees the holder a future sale at a fixed “execution” price. The holders of the option will exercise the option if market prices are below the execution price. The FEPM, on the other side, allows farmers and agricultural MSME to store their production and to take advantage of seasonal price fluctuations.

65. As the definition of minimum prices for agriculture products above those established by the market has proven to be ineffective in many countries,\(^ {44}\) the Brazilian shift in price support instruments to more market-based instruments is a welcome development that should be refined to facilitate the use of such instruments by small and medium sized farms and their cooperatives.

4.2.3 General risk management instruments

66. In contrast to other countries in Latin America, Brazil does not have a partial credit guarantee (PCG) scheme that could support the granting of loans to the agriculture sector. Brazil has a system of credit guarantee schemes, mainly operated by SEBRAE and BNDES for MSMEs,\(^ {45}\) but which do not cover the agriculture sector. Often, land cannot be used as collateral by financial institutions, as the justice system can rule that land is critical for farmers’ subsistence, and therefore not enforceable upon. PCG schemes have been proven effective instruments in other countries to address borrowers’ problems of lack of collateral or insufficient collateral. While PCGs do normally not help the borrowers in case of default (borrowers remain liable for repaying the guaranteed loans, even in case the guarantee is triggered), such schemes have proven useful in helping financial institutions lend to clients that are perceived to entail higher risks. PCGs are usually cheaper than insurance and they cover the financial institution in the case of default, regardless of the factors that caused the default. BNDES is currently working on the establishment of a credit guarantee fund for the agriculture sector.

\(^{43}\) During and after the agricultural crisis of 2004, the minimum price instruments were complemented by the introduction of market-based mechanisms: the subsidization of private sell option contracts (PROP—Prêmio de Risco para Aquisição de Produto Agrícola oriundo de Contrato Privado de Opção de Venda) and, in 2012, the FEPM (Financiamento para estocagem de produtos agropecuários), a program that provides financing for products storage that are part of the PGMP.

\(^{44}\) In Europe such policies generated excess production that had to be stored and disposed at high costs while increasing the costs that consumers must pay for some goods.

\(^{45}\) The schemes work mostly with public banks.
5 Main conclusions and recommendations

67. Government programs under the SNCR have been the main source of rural credit in Brazil and supported the development of the agriculture sector, but market conditions have changed. In recent years the number of farmers obtaining credit though public programs has declined and market-based instruments, such as agricultural letters of credit, are gaining importance, especially for large farms.

68. Regional distribution trends, limited funding for sustainable agriculture, and the recent decline in loans to small farms raise questions about optimal design of programs and adequate targeting. The share of farmers using credit funded by government programs, including PRONAF, is substantially lower in the poor Northeast, which is home to the vast majority of small farms, than in the more developed South. Programs also provide only limited funding for low carbon agriculture. The government supports climate smart agriculture through its ABC program, but it faces limited demand and volumes appear to be modest relative to the investment required to meet Brazil’s reforestation targets and, more broadly, shift agricultural production to more sustainable practices. The last years also saw a sharp reduction in the number of loans to small farms and a large increase in the average loan size.

69. While the fiscal costs of the programs appear modest, the public interventions come at costs to financial intermediation and the efficiency of resource allocation. The mandatory lending quotas constrain the volume of funds that banks can lend to non-earmarked segments and there is some evidence that banks compensate the impact of capped earmarked rates on their profitability by charging higher rates on non-earmarked credit. Another flip side of the cheap funding sources of rural credit via mandatory quotas on deposit and savings accounts is that savers often receive limited remuneration and constrained savings options. Earmarked credit also reduces the efficiency of monetary policy transmission. The distortions to the financial sector thus call for revisiting the funding mechanisms and design of agricultural support.

70. The increasing importance of climate change-related risks makes it necessary to foster the supply of well-designed insurance and risk management instruments. The provision of insurance premium subsidies has promoted the expansion of commercial agricultural insurance, but there are limitations in the predictability of resources, pricing and payout policies, and how the subsidies are distributed. In addition, policies addressing agricultural risks, especially production risk, have significant limitations in their design that originate from outdated market conditions. These risk management programs face important challenges that limit government authorities from implementing a comprehensive risk management and cost-effective risk financing approach. The lack of integration of all different programs results in duplication of efforts and unnecessary use of resources.\[46\] The lack of a risk financing strategy, an overall poor coordination and alignment of the programs, deficiencies in pricing and payout policies, as well as lack of integration of existing data on risks and yields, result in an inefficient and unpredictable demand for public resources, while providing a justification for frequent loan rescheduling / loan forgiveness programs.

\[46\] A detailed analysis of the main shortcomings can be found at Arias et al., 2016
71. Against this background an action plan around four lines of action is needed:

- Reform of lending programs for family farms;
- Reform of lending programs for mid-size and large farms; and
- Reform of financial instruments to manage risks.
- Reform of coordination and monitoring frameworks, and improvement of data.

72. The complexity of the task of defining and implementing such reforms makes it necessary to strengthen the coordination mechanism and to carefully design the transition from the current system to a new system that is expected to mobilize significant additional funding.

5.1 Reform of lending programs for family farms

73. The lending programs in support of this segment are relatively well established, but the main concern is that they only reach a decreasing minority of family farms, mainly through public and cooperative lenders. The following suggestions aim to address these issues and to improve the effectiveness of subsidies and to foster competition.

➢ Revise the form, in which loans are subsidized to ensure adequate support for smaller loans

74. The supply and use of financial services by the smaller farms of this segment has decreased substantially in recent years, reflecting fiscal constraints as well as, probably, an inadequate design of the subsidization instruments.

75. Identifying the factors behind such decline is key, which may be caused by both supply and demand constraints. Research should look at a) the profitability of the use of such services by family farms of different sizes as b) the profitability of providing such services for lending institutions to the different sub-segments of family farms, considering all cost factors (administrative, risk related, program related, etc.) and income sources (interest and fees, subsidies, etc.). One possible outcome of the analysis could be a reform of the form of subsidization of loans, which could lead to a replacement of subsidized interest rates by a flat “per-loan” subsidy covering (part of) a loan’s administrative costs. A measure of this kind would reduce the subsidization of larger farms, as the amount of the subsidy would not be related to the loan size, while increasing support for lending to smaller farms, which would become more attractive for lenders.

76. The concentration of lending to this segment in the hands of a few public financial institutions and financial cooperatives limits competition and innovation. As one important distorting element leading to this situation is related to the differentiated access to subsidies. Recent legal changes in April 2020 will enable access to subsidies for the private banks as well.

➢ Significantly streamline the subprograms under PRONAF to reduce complexities
➢ **Strengthen matching grant programs that address capacity constraints for the growth of small farms and firms (e.g. vouchers for t/a, other)**

77. **The subsidization of interest rates has important shortcomings, such as:**
a) it only reaches farmers who borrow from participating institutions, 
b) it provides larger subsidies to larger farms; and 
c) it only addresses the cost of borrowing and not other constraints that smallholder farms face to increase their productivity and income. One way to address these issues is to assign part of the resources allocated to subsidize loans to technical assistance and, if feasible, also small grants for investments that catalyze increased income. At the regional level, Brazil has a rich experience in the implementation of matching grant programs that facilitate smallholders' access to technical assistance utilizing market mechanisms, and to small investment grants that could be scaled. As agriculture diversifies and smallholder farmers may be exiting agriculture, such instruments should be geared to both: increasing agricultural productivity and, also, to provide support for the transition to non-agricultural activities.

There has not been an evaluation of the impact of matching grants’ on farmers’ ability to gain access to finance post interventions, which should be considered.

5.2 **Reform interest rate controls and subsidies for lending to medium and large farms**

78. **The current policies in support of lending to medium and large commercial farms distort the markets as they take advantage of lending quotas and as they are subject to interest rate caps.** These distortions seem no longer justified as large farms can increasingly access other financing options (i.e. LCAs). It is thus recommended that public support to this segment is reduced and the free additional resources are assigned to support family farms and the financing of programs that clearly contribute to obtain public goods (e.g. lower carbon agriculture), along the following lines:

➢ **Eliminate quotas and interest rate caps for loans granted to large farms**

79. **Brazil should eliminate any interest rate controls and the use of quotas for loans granted to large farms as part of the SNCR since such farms have access to a wider range of financing options (e.g. LCA and other) both in Brazil and abroad.** By doing so, Brazil would reduce distortions in the financial sector and facilitate the operation of a fully commercial agricultural lending market for this important segment, that later could also serve medium sized farms.

➢ **Revise subsidies/incentives to lending programs for large farms, focusing on targeting the allocation of subsidies/incentives exclusively to the financing of programs that clearly contribute to public goods**

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47 E.g. the use of vouchers so that beneficiaries can select the providers

48 See Annex 8 for more detail and for international experience.
80. **Considering the fiscal constraints and the dynamic development of commercial agriculture, programs that support large farms should be revised, evaluating their impact and contribution to development objectives.** Given the dynamic development of the Brazilian commercial agriculture, Brazil should focus the allocation of publicly subsidized loans exclusively to the financing of programs that clearly contribute to public goods (e.g. lower carbon agriculture), and severely limit the access of these farms to other programs (e.g. those related to mechanization or for special crops, etc.). This revision may result in the liberation of substantial public resources that could be allocated to strengthen the programs in favor of family farms and medium-sized farms, as well as to enhance the support granted for risk management instruments. The process to phase out subsidies should be carried out by gradually limiting the maximum amounts of subsides that can be granted to large loans.

81. **In the case of tax exemptions for agricultural financing instruments (LCAs and other), subsidies should benefit issuers and not investors.** This reallocation would benefit farms and firms serving agriculture and would attract institutional investors to commercial financing. Institutional investors are the main source of commercial financing and currently have a small participation in the financing of commercial agriculture.

- **Revise the programs for mid-sized farms following an analysis of current market conditions, and phase out quotas and interest rate caps gradually**

82. **In the case of lending to mid-sized farms, authorities should revise and streamline the many programs that area available to this segment in order to:** a) reduce the number of programs, b) harmonize and simplify conditions and procedures, c) enhance their effectiveness, d) reduce their fiscal cost; and e) clarify the public objective. In the case of the ABC program administrative procedures should be simplified and the level of subsidy should have the objective of “internalizing” environmental externalities, including but not limited to mitigation externalities.

5.3 **Reform of financial instruments to manage risks**

83. **The increasing importance of climate change-related risks makes it necessary to place a stronger emphasis on measures to mitigate risks,** such as investments in irrigation and drainage, logistic infrastructure, diversification, as well as fostering the supply of well-designed risk transfer instruments (i.e., agricultural insurance products) and other risk financing instruments that can provide access to funds needed to cover the losses triggered by a disaster.

84. **Policies addressing agricultural risks and, especially, the agricultural production risks, have significant limitations in their design that originate from outdated market conditions.** The lack of a risk financing strategy, an overall poor coordination and alignment of the programs, deficiencies in pricing and payout policies, as well as lack of integration of existing data on risks and yields result in an inefficient and unpredictable demand for public resources, while providing a justification for frequent loan rescheduling / loan forgiveness programs. These problems are compounded by the

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49 This section incorporates some suggestions made in the 2016 World Bank report “Policy note for strengthening the agricultural insurance market in Brazil”
relatively unstable allocation of fiscal resources over the years, that makes it difficult for insurers to adequately plan their business activities. The Brazilian government has established an Inter-Ministerial Working Group that is in process of preparing recommendations to strengthen the risk management policies.

85. **The commercial supply of insurance has been growing significantly and new entrants start to compete for this market**, which is expected to grow at a rate ranging from 10 percent and 20 percent annually and to potentially increase premium volume to USD 2 billion in the first half of the coming decade\(^{50}\). However, the challenges faced for the expansion of the different firms in terms of geographical presence and data/knowledge are steep.

- Introduce an integrated disaster risk management and agricultural risk financing strategy using a public-private partnership model (PPP)

86. **A reform of the financial instruments to manage risks should be developed under the umbrella of an integrated disaster risk management strategy and agricultural risk financing strategy.** The above will facilitate the distinction of those risk-reduction and risk-transfer measures that are most appropriate to address the losses given their probabilities of occurrence; thus, assisting government authorities in determining the most appropriate risk management measures within each risk layer. Furthermore, the above enable conditions for a) the coordination of public and private actors as well as b) the implementation of measures to incorporate private insurance and risk hedging companies into this activity (taking advantage of the significant advances that agricultural insurance is experiencing in Brazil and worldwide) and c) the implementation of measures that help to correctly calculate the cost of covering such risks through actuarial methods.

87. **The state of development of private agricultural insurance in Brazil makes is possible to develop a joint PPP strategy that takes a risk-layered approach.** Regarding events with a high probability of occurrence and low impact, risk retention instruments could be implemented among farmers (i.e., savings) and government entities (i.e., emergency funds). In case of events with a moderate probability of occurrence and level of impact, a combination of self-retention and risk transfer instruments could be adopted. The above may include, among other: the use of emergency funds (i.e., Fondo de Ahorro in Panama), credits, catastrophic bonds and parametric insurance (i.e. Catastrophic Insurance Component of CADENA in Mexico). Finally, catastrophic bonds can be adopted for those less frequent events, but that generate a high level of impact. There are several countries in the region that have successfully implemented layered approaches (i.e., Colombia, Perú and México); therefore, Brazil could design and implement its own strategy based on the lessons learned from these countries, particularly from Mexico that has been at the forefront in the implementation of such concept for the agricultural sector.

88. **There are opportunities to accelerate the growth of the agriculture insurance market in Brazil in a more efficient and effective way.** For instance, investments could be made to promote the exchange of information, improve the quality and availability of data/information to improve the performance

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of existing instruments and the design of new tools. In addition, applied research could be re-directed towards a better understanding and assessment of agricultural risks. The abovementioned also refers to the need of carrying out technically sound actuarial assessments of risks incurred by all programs to obtain a clear understanding of their actual costs and to be able to enhance the corresponding budgeting processes.

89. An initial agreement for the establishment of a national PPP scheme should be based on a review of the public-sector programs (building on the work done by the above-mentioned Inter-Ministerial Commission). It should define the objectives, basic principles and strategic pillars of a national policy as a base to (re-)define the roles and responsibilities of the key public and private sector stakeholders. In addition, it should define a suitable coordination mechanism, which could potentially be a sub-committee of the rural finance council proposed in section 5.4.

➢ Reform and consolidate existing risk management programs, including PSR (insurance subsidies), Proagro, and Proagro Mais

90. The steps undertaken so far to foster the private supply of agricultural insurance has contributed to the establishment of a private insurance industry and should be expanded. In addition, recent reforms to enhance the allocation of subsidies are slowly increasing participation of new entrants and should be continued, complemented with measures that increase the transparency in this incipient market.\(^{51}\)

91. The coverage of the PSR program account for about 25 percent of the total premiums for the rural sector in 2017 (US$ 1.1 billion), and the level of support it may have from government authorities can have an impact on agricultural insurance penetration. For instance, the insured area in 2015 declined by 70 percent compared to the previous year because PSR subsidies dropped by 60 percent. Although subsidies recovered over the period 2016-2018, uncertainty about the availability of resources to subsidize insurance premiums remains an issue. In this respect, a longer budgetary planning, the development of public goods (i.e., data infrastructure, crop risk models), and the provision of technical assistance is essential to give certainty to insurance companies and producers. If demand for this type of insurance is strong, ceilings for subsidies per farmer could be reduced to support small and medium-sized farms more strongly.

92. Although the Proagro and Proagro Mais programs provide valuable support to family farms obtaining credit under the PRONAF Program, they generate significant fiscal uncertainty that could be addressed by incorporating private insurers to price and manage risks. While there are several options to incorporate private insurers, the following actions are advisable at this point given the stage of development of the market:

- Assess the viability of transferring the medium sized farms benefitting from the Proagro program to the PSR program by private insurers, ensuring a similar level of subsidization of premiums for the transitioning farmers than the one obtained under the Proagro scheme;

\(^{51}\) E.g. the publication of Commercial Premium Reference Rates.
• Evaluate the options to commercially re-insure the Proagro Mais Program, which could remain under public sector management, to reduce the fiscal exposure to risks.
• Assess the viability of transitioning the Proagro guarantees from a multiperil scheme to one providing coverage using area yield insurance methodology that can build on previous experience in Brazil. Given advances in technology, area yield insurance schemes that combine satellite imagery with crop cutting exercises for homogeneous areas have become more feasible, reducing the administrative costs for insurance and increasing the accuracy in estimating losses, even in the case of mid-size and smaller farms.

➢ Consider merging Bolsa Estiagem and Garantia Safra

93. Garantia Safra and Bolsa Estiagem are two popular income compensation mechanisms for small family farms in Northeast Brazil. Nevertheless, these programs face important challenges that not only threat any attempt for expansion but also their financial sustainability. The semi-arid is market by an erratic rainfall pattern and low rainfall regime (below 800 mm per year); therefore, it is responsible for a high incidence of crop losses. The above situation along with the fact that government authorities bear their financial and operational costs and that there is not any actuarial analysis to assess risks, extraordinary budget allocation are constantly approved to increase programs’ risk financing capacity. Finally, Garantia Safra and Bolsa Estiagem are two programs that focus on the same region and benefit the same target groups; this situation limits opportunities for expansion. Given the need to optimize the use of available resources, Brazil should:

• Merge both programs and unify the rules based on which the income compensation payouts will be distributed to target groups. Regarding the latter aspect, for instance, one of the payout mechanisms approved by Garantia Safra program is based on the water requirement satisfaction index (WRSI), an objective parameter that estimate crop’s yield response to water deficit. Furthermore, Brazil could take advantage of existing agrometeorological information systems (i.e. CONPREES and AGRITEMPO) to improve the assessment of the level of impact that different agroclimatic risks generate on crops, for example by enhancing the existing database used by the Agroclimatic Risk Zoning (ZARC) developed by EMBRAPA.
• Transfer the risk to international markets to stabilize fiscal expenditures. As mentioned, the Northeast of Brazil is drought prone area where farmers constantly experience crop losses; therefore, any insurance instrument implemented there is likely to be expensive for the firsts layer of the risk. However, an option to be studied by the government could be to purchase a facultative Excess of Loss Reinsurance on the retention of the program.

➢ Review the role of the Crop Insurance Stabilization Fund (FESR)

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52 See WB, Arias et al, 2016
53 The Federal Government has approved contingent credits in a regular basis to help the Garantia Safra Fund keep a financial equilibrium and meet its financial obligations. During the period 2006-2013, for instance, contingent credits have exceed by 160% on average the amount budgeted.
94. **FESR was established at a time when the insurance industry in Brazil was nascent and closed to external competition.** Since then, a vibrant insurance and re-insurance industry has emerged and has the capacity to deal with sector risks. Given these developments, the relevance of this re-insurance mechanism should be examined. Brazil should review whether this Fund is necessary, and if not, allocate resources to support the catastrophic layer in a future structured risk financing strategy to benefit the participating insurance companies.

➢ *Strengthen the use of market-based mechanisms for price support*

95. **The reduction in the use of minimum prices and the increased use of incentives to use option on futures contracts as the main instruments to hedge prices risks is a welcome development that provides more certainty to market participants and to the state budget.** Given the progress achieved so far, strengthening the use of market-based mechanisms for price support and using income support programs in case of severe price drops is advisable.

96. **While the subsidization of options on futures contracts does not distort the product markets and provides price certainty to producers, the use of future options comes with a high level of complexity and such contracts require a minimum-size that is in most cases beyond the capacity of even medium sized farms.** To further expand the use of these instruments, it is necessary to support small and medium sized farms through technical assistance and training as to enhance their understanding and capacity to use such instruments. As options contracts require a minimum size that is usually beyond the reach of small or even medium sized farms, it is also necessary to explore how smallholder farms and those cooperatives could be supported to aggregate their production.54

97. **Price hedging instruments may not become available to all farms and severe price drops may create social hardship.** Therefore, providing direct income support to very small and vulnerable farmers is essential and should follow the same channels used for catastrophic insurance, which were described above.

➢ *Consider the introduction of a Partial Credit Guarantee (PCG) scheme for agriculture*

98. **A partial credit guarantee system could significantly contribute to address the problems faced by financial entities serving family farms that cannot pledge their land as collateral, as well as farms in areas with inadequate land titling.** In several countries such schemes have contributed to enhance lending conditions to these segments (see Annex 6 on FOGAPE in Chile). While partial credit guarantee schemes aim to cover lenders against loan losses, they do not provide coverage to the final borrowers in case of events negatively affecting production or agricultural markets. PCGs and insurance are complementary to each other. By acknowledging this complementarity, premiums for PCG services can be reduced if the end-borrowers have insurance coverage against relevant risks affecting their payment capacity. However, international experience shows that the success of PCG schemes depends crucially on the design of the scheme. In particular, attention should be paid on the legal and regulatory framework, corporate governance and risk management, operational framework, as well

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54 The ASERCA program in Mexico has undertaken activities to help
as monitoring and evaluation of PCGs (see Annex 7 on Principles for Public Credit Guarantee Schemes). The current PCG schemes in Brazil have mostly worked with the public banks. Future initiatives for improving the current PCG schemes, and establishing a PCG for the agriculture sector, should aim to also crowd-in the private sector, and incentivize their lending to agriculture.

5.4 Coordination and monitoring

99. The definition and implementation of a path to reform the agricultural finance policies and programs in Brazil requires the existence of a body that has the authority to develop a proposal and then to coordinate and oversee the required actions to implement the approved plan.

100. It is important to strengthen the coordination team including, at least, the Ministry of Finance, the Ministry of Agriculture and the Central Bank. The coordination team should elaborate in consultative manner a proposal to: a) update the objectives of the agricultural finance policies; b) simplify and reform the public financial sector interventions and programs, and c) develop an action plan and communications strategy for the reforms. The coordination body should be established for a several-years period and tasked to prepare the reforms in consultation with relevant public and private entities, including prominently representatives from the farmers associations and from the public and private financial institutions participating in the execution of the different policies. The coordination body should in turn have at least two working groups that look at a) the reform of the lending programs and b) the reform of the risk management programs.

101. In order to update the objectives of the agricultural finance policies, it is important to consider that agricultural finance takes place at the intersection of agricultural policies and financial sector development policies. While agricultural policies mainly aim to increase production and productivity and to enhance the welfare of farmers, financial sector policies aim to ensure the stability and efficiency of the financial sector and, also, its expansion to provide suitable services to the poorer and more marginal segments of the population. As of today, the objectives of the agricultural finance policies in Brazil are mainly aimed to strengthen agricultural production and productivity, to improve the standards of living of family farms and to achieve an array of other objectives (fostering low-carbon agriculture, mechanization, etc.). While these objectives are valid and should continue to guide policies, broadening the scope to also include objectives that aim to foster the competitive and sustainable supply of such financial services is essential. Furthermore, strengthening the private supply of such services is also important, especially considering the current level of development of the Brazilian agricultural finance market, as well as the fiscal limitations of the country.

102. The definition and implementation of reforms should be backed by an assessment of the recent evolution in the demand for public instruments, as well as the effectiveness of current policies and instruments. It would be important to better understand the decrease in the number of users of public programs, especially by small farms, and also to shed light into the discrepancies between the

results of the data provided by the census and the numbers provided by banks and cooperatives about the number of borrowers benefitting from government programs.

103. **Aside of considering the suggestions made above, the reforms to the different programs should prominently include measures to simplify them and to enhance their predictability.** To reduce the complexity of programs, Brazil should analyze options to reduce their number, harmonize relevant parameters (i.e. interest rates, maturities, operational policies and procedures, etc.), enhance transparency and reduce transaction costs.\(^\text{56}\) The predictability of programs could also be improved by introducing multi-year budgets.

104. **As a significant element for the design and implementation of a reform program, Brazil should incorporate a permanent mechanism to monitor the impact of agricultural finance policies, providing specific and quantifiable targets to be achieved by each one of the different instruments\(^\text{57}\).** Such mechanisms, which are oftentimes also part of National Financial Inclusion Strategies, would allow for program revisions that would feed reform implementation and, especially, allow for corrective actions to be taken when programs do not develop favorably.

105. **In addition, data supporting agrifinance policies should be improved.** Tools like the agroclimatic zoning should be supported and improved as a basis for helping develop the rural finance market.

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\(^{56}\) The simplification of programs can take as a reference the suggestions made in the 2018 Policy Brief of CPI on the Fragmented Rules of Brazilian Rural Credit cited above.

\(^{57}\) The PATMIR program that has been implemented in Mexico to expand the reach of financial services in rural areas introduced a systematic approach to monitor the costs and results of the program and could serve as a reference. In addition, there are several examples of programs that monitor the effectiveness of social policies (e.g. Coneval in Mexico).
6 Literature


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Plano Safra da Agricultura Familiar 2017 / 2020 SEAD

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Annex 1: Public Policies and Supply of Financial Services

53. **Brazil’s agricultural policy is based on two policy instruments.** The first and most important aims to support the rural credit system for commercial and family farmers; and the second aims to contribute to a better mitigation of risks through insurance programs and price support for some agricultural products. For government programs, farmers are segmented into two groups: family farms and commercial farms (medium and large sized farms). While the segmentation appears reasonable given the different characteristics and challenges that farms of different size face, the amounts of maximum income for the family farm segment appear to be at the high end, including farms that in other Latin American countries would be considered as medium sized farms. In addition, the criteria for the regional determination of the size of the fiscal modules seems outdated. The criteria for the segmentation are the following:

<table>
<thead>
<tr>
<th>Criterion:</th>
<th>Family farms</th>
<th>Medium sized farms</th>
<th>Commercial farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land size</td>
<td>&lt; 4 modules</td>
<td>4 – 15 modules</td>
<td>&gt; 15 modules</td>
</tr>
<tr>
<td>Gross Annual income</td>
<td>&lt; R$ 415,000</td>
<td>R$ 415,000 – R$ 2,000,000</td>
<td>&gt; R$ 2,000,000</td>
</tr>
</tbody>
</table>

54. **In early 2019, the Government incorporated the “Special Secretariat for Family Agriculture and Agrarian Development” (SEAD) into the Ministry of Agriculture, Livestock and Supply (MAPA), which is now the main entity in charge of setting agricultural policies.** Depending on the segment, farmers are subject to a differentiated level of support in accessing financing and risk management instruments, based on a yearly allocation of resources. In this process, the policies and parameters (amounts, interest rates, financing limits, etc.) related to family farming are established in the Family Agriculture Plan, while those for commercial farming are outlined in the Agricultural and Livestock Plan (PAP). Besides MAPA being responsible for preparing the plans, the Ministry of Finance (MF) and the Central Bank of Brazil are involved in this process, mainly to negotiate the terms of the plans and to ensure public funding. At the end of the process, the Central Bank issues the updated *Rural Credit Manual* consolidating the norms applicable to rural finance.

**RURAL CREDIT**

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58 Medium and large sized farms usually have a more professional management and easier access to know-how, markets and financing. Small farms are usually less integrated into markets and have a stronger tendency to diversify their incomes outside of agriculture, effectively transitioning in many cases away from agriculture as their main income source.

59 The size of the fiscal modules differs depending on the region and the quality of land. In the country’s south, one module is equivalent to 5 hectares, in Mato Grosso, it is equivalent to 110 hectares.

60 The CPI policy note (2017 1) states: “Almost 40 years after the definition of the size of the fiscal module was created for each Brazilian municipality, technologies and infrastructure have improved, increasing the productivity of lands that used to be considered infertile. Even though the fiscal modules did not incorporate important changes in Brazilian agriculture in the last decades, they still determine eligibility for important rural credit resources. Therefore, the gap between this outdated definition of fiscal modules and the policies based on the definition can lead to distortions in credit access.”
Public lending policies and programs

55. **Public policies related to agricultural credit aim mainly to enhance the performance of the agricultural sector and do not include objectives related to the financial sector.** The main objectives of the National Rural Credit System (SNCR) as stated in the *Rural Credit Manual*[^61] are, among others, to: a) support agricultural production, productivity and investment; b) enhance the income of farms and firms; c) improve the standards of living of the rural population; and d) facilitate the acquisition of land by smallholders and squatters. In consistence with the general guidelines, credit policies have a special focus on supporting smallholder “family farms,” for which special preferences are granted. Although these policies require the participation of the financial sector, there are no explicit objectives linking these policies to financial sector objectives of stability and inclusion.

56. **Policies related to agricultural lending involve a complex set of rules and actors.** Such policies regulate: the sources of funding that must be applied to finance agriculture, the financial sector entities that have access to the different programs, the programs themselves, and their beneficiaries.

Rural credit funding sources

57. **Mandatory lending quotas constitute the largest share of funding for agricultural lending within the SNCR.** These quotas include compulsory resources (*resources obrigatórios*) and rural savings (*poupanca rural*), and are based on percentage of current account deposits and rural savings accounts that have to be used for rural lending at pre-determined rates. Resources coming from lending quotas accounted for 59 percent of total funding within the SNCR in 2017. Other important public funding sources are resources provided by BNDES/FINAME for special programs, accounting for 9 percent of total funding, as well as by constitutional funds that aim at the development of the Northeastern, Midwestern, and Northern regions (see Table 2).

58. **Market-based instruments, such as agricultural credit notes (LCAs), are gaining importance.** Figure 5 shows that funding from compulsory resources and BNDES/FINAME has been decreasing steadily. Their share of funding dropped from 41 percent and 11 percent respectively in 2013 to 29 percent and 9 percent in 2017. During the same period, the use of commercial instruments, such as the Agricultural Credit Lines (*Letra de Credito do Agronegocio - LCA*)[^62] has gained importance. LCAs accounted for 13 percent of total funding in 2017.

59. **LCAs have become the main source of market financing for commercial agriculture, mainly due to tax exemptions for individuals.** Individuals are exempt from taxes for the income they make from investments in agricultural financial instruments, which reduces the interest rate of LCAs. The exemption increases substantially the attractiveness of such instruments for individuals, who currently hold the majority of LCAs. While it also increases the availability of financing for commercial agriculture, this form of tax exemption also has an important distortive effect on the market in


[^62]: LCAs are backed by a variety of instruments such as Banking Credit Notes (CCB) (higher volume), Certificate of Agribusiness Credit Rights (CDCA), Rural Product Note (CPR), Rural Pledging Instrument (CRP), and Agribusiness Credit Receivable Certificates (CRA), by which farmers obtain funding pledging their future crop.
detriment of instruments that do not have such tax exemptions. In addition, other segments of investors are under a different tax framework or exempt of tax (pension funds, mutual funds, banks and foreign investors), furthermore limiting the growth and diversification of this market.

### FUNDING SOURCES FOR RURAL CREDIT

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compulsory resources</strong> <em>(Recursos Obrigatorios – MCR 6.2)</em></td>
<td>Compulsory resources consist of 30 percent of deposits in current accounts collected during the period of one year by Brazilian financial institutions.</td>
</tr>
<tr>
<td><strong>Rural savings</strong> <em>(Poupanca Rural – MCR 6.4)</em></td>
<td>60 percent of the deposits of rural savings resources collected by banks, must be used for rural credit operations. This applies to the following three institutions: <em>Banco do Brasil, Banco do Nordeste, Banco da Amazonia</em> and credit cooperatives.</td>
</tr>
<tr>
<td><strong>BNDES/ FINAME</strong></td>
<td>BNDES FINAME’s resources are primarily focused on technological innovation, equipment acquisition, machinery and projects. Most resources are allocated to producers through commercial banks in different credit lines as <em>Programa ABC, Moderagro</em> and <em>Moderfrota</em>. The majority of funds raised by BNDES comes from National Treasury and Fund for Workers' Assistance (<em>Fundo de Amparo ao Trabalhador – FAT)</em>.</td>
</tr>
<tr>
<td><strong>LCA</strong> <em>(Letra de Credito do Agronegocio)</em></td>
<td>Agricultural credit notes are instruments offered by public and private financial institutions for their clients to invest. Of the total collected, 35 percent should be applied to rural credit and, out of these, at least 40 percent must be applied at an effective interest rate of up to 12.75 percent per year (<em>taxa favorecida</em> / controlled rate), and up to 60 percent may be applied at freely agreed rates (<em>taxa livre</em> / free rate). These resources are not linked to any program.</td>
</tr>
<tr>
<td><strong>Constitutional funds</strong> <em>(Fundo Constitucional de Financiamento do Nordeste (FNE); Fundo Constitucional de Financiamento do Centro-Oeste (FCO); Fundo Constitucional de Financiamento do Norde (FNO))</em>*</td>
<td>The constitutional funds for financing are resources aiming at the growth and development of Brazil’s Northeastern, Midwestern, and Northern regions. The constitutional funds consist of 3 percent of the collection of taxes on industrialized products and income tax. A portion of these funds is invested in rural credit operations with subsidized interest rates. The Central Bank (Rural Credit Manual) defines the financing limits and interest rates for investments.</td>
</tr>
</tbody>
</table>

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**SNCR: RURAL CREDIT FUNDING SOURCES**

*(% of disbursed amounts)*
Rural credit programs

Resources raised from the sources mentioned above are channeled to the rural sector via several programs. The largest programs are outlined in the Table below.

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
<th>Funding sources</th>
<th>Interest rate</th>
<th>Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRONAF (national program for family farming)</td>
<td>PRONAF aims to improve financing and increase productivity in family farming activities, and generate income for family farmers and rural settlement beneficiaries</td>
<td>Rural savings, Compulsory resources, BNDES/FINAME, Constitutional funds, Other</td>
<td>0.5% - 5.5%</td>
<td>Family farms</td>
</tr>
<tr>
<td>PRONAMP (national program for medium producers)</td>
<td>PRONAMP promotes the development of medium producers’ activities, increasing income and generating jobs in rural areas.</td>
<td>Rural savings, Compulsory resources, BNDES/FINAME, Other</td>
<td>7.5%</td>
<td>Medium-sized farms</td>
</tr>
<tr>
<td>MODERFROTA</td>
<td>MODERFROTA’s main goal is to finance the acquisition of agricultural equipment.</td>
<td>BNDES/FINAME, Rural savings, Other</td>
<td>7.5%-9%</td>
<td>Rural producers</td>
</tr>
<tr>
<td>FUNCAFE (Fund for the coffee industry)</td>
<td>FUNCAFE provides financial support for activities carried out in coffee plantations, such as harvesting and storage.</td>
<td>Fund for the Defense of the Coffee Industry</td>
<td>8.5%-11.25%</td>
<td>Coffee producers</td>
</tr>
<tr>
<td>ABC (national program for low carbon emissions in agriculture)</td>
<td>ABC aims to support investments that reduce environmental damage caused by agricultural activities.</td>
<td>BNDES/FINAME, Rural savings</td>
<td>7.5% (decreased to 6% in 2018/2019)</td>
<td>Rural producers</td>
</tr>
</tbody>
</table>

A complete list of all programs is available in the Appendix.
61. **The largest rural credit programs in terms of volume are PRONAF and PRONAMP, both funded primarily by rural savings and compulsory resources (Figure 6).** PRONAF, which currently has 13 sub-programs, targets small producers and family farms. In 2017, credit disbursed under PRONAF accounted for roughly R$ 21 billion (see Figure 6). It is thus the largest rural credit program, accounting for 35 percent of the total volume disbursed. The volume disbursed under PRONAF has been fairly stable over the last five years. The second largest program is PRONAMP, which aims to improve financing primarily for medium-sized farms with an annual income below R$ 1.76 million. Credit under PRONAMP increased by 42 percent between 2013 and 2017 to almost R$ 20 billion. The increase in PRONAMP volumes was supported by an increase in the eligibility ceiling for working capital loans from R$ 500,000 in 2012/2013 to R$ 1.5 million in 2017/18, which made a larger set of farms eligible for the program.

62. **MODERFROTA is also available for larger producers.** MODERFROTA, which finances the acquisition of tractors, harvesters, and other agricultural equipment, is the third largest rural credit program. It is also available for medium and large producers, although the interest rate rises for producers with an annual return exceeding R$ 90 million. MODERFROTA is primarily financed by BNDES/FINAME and has been growing rapidly over the last years.

63. **The ABC Program, which is the public program to finance low-carbon agriculture in Brazil, faces limited demand.** This program is the main credit line to finance the environmental goals and technologies presented in the Brazilian Low Carbon Agricultural Plan (ABC Plan). Most recipients are medium-sized farms. Even though the ABC program has attractive conditions in terms of interest rates, grace period and payment terms, it represents only a very small fraction of rural credit. Resources disbursed to the ABC Program were, on average, 59 percent of total budgeted resources in the last eight years. According to Barrios (2017), the low level of disbursements is related to a number of factors, such as: climate risk, infrastructure and logistic problems, difficulties in accessing markets, uninformed producers, deficient rural assistance, and banks not being prepared to deal with producers’ lack of interest. A cumbersome application process, which requires evidence of climate benefits, is also a major bottleneck. For instance, the ABC credit line used to have the same interest rate of PRONAMP, but a more cumbersome application process. Often farmers used different sources of funding for ABC technologies. The ABC interest rate was reduced to 6 percent in 2018/19, and demand increased by 44 percent compared to the previous year.

64. **Loans linked to a specific program follow that program’s rules concerning borrowers’ eligibility, interest rates, credit limits, destination, and other conditions.** Under most programs, interest rates are capped, with the level of the cap ranging from as low as 0.5 percent per annum under PRONAF to 11.25 percent under FUNCAFE. In addition, the payment terms vary substantially between programs. For example, while PRONAF and ABC loans can have maturity of up to 20 years and 15 years respectively, PRONAMP loans offer a maximum of eight years.

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64 BARROS, A. M (2017). Low Carbon Agriculture: evaluation of the strategic use of the priority areas of the ABC Program.
A substantial share of rural credit, while coming from mandatory sources, is not linked to a specific program. The volume of rural credit that is not linked to a specific program increased from R$ 85 billion in 2013 to R$ 98 billion in 2017. This non-linked credit is also predominately funded by mandatory resources (compulsory resources and rural savings). Loans that are not linked to a specific program follow the conditions of the funding source. For example, loans funded with compulsory resources or rural savings have an interest rate cap of 8.5 percent and financing limit of R$ 30 million. In contrast, there are some founding sources that allow interest rates and other conditions to be agreed freely between lender and borrower.

Source: Central Bank of Brazil – SICOR
Detailed Overview of Rural Credit Programs

There are 14 rural credit programs, as described below. In addition, Pronaf, has 13 sub-programs oriented to investments.

<table>
<thead>
<tr>
<th>Programs</th>
<th>Objectives</th>
<th>Beneficiaries</th>
<th>Resource</th>
<th>Interest rate (% per year) 2017/18</th>
<th>Payment term</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRONAF</td>
<td>Generate income for the family farmers and settlers of agrarian reform and increase the productivity of family farming</td>
<td>Farmers and rural producers who are part of family units of rural production and who demonstrate their eligibility by presenting the active “Declaração de Aptidão ao Pronaf” (DAP)</td>
<td>IHCD, FAT (Fund for Workers’ Aid), BNDES / FINAME, Constitutional Funds, Rural Savings, Compulsory Resources, Funcafé, National Treasury, Required Reserves on Cash Deposits, Unrestricted Resources Subsidized</td>
<td>from 0.5% to 5.5% per year, depending on the Project to be financed</td>
<td>up to 20 years</td>
</tr>
<tr>
<td>PRONAMP</td>
<td>Promote the development of medium producers’ activities, increasing income and generating jobs in countryside</td>
<td>Land owners, tenants, lenders or partners who have at least 80% of their annual gross income from agriculture or extractive vegetal activities, limited to gross annual income of up to R$ 1.76 million.</td>
<td>IHCD (Hybrid Instrument of Capital and Debt), BNDES/FINAME, Constitutional Funds, Rural Savings, Compulsory resources, Unrestricted Resources</td>
<td>7.50%</td>
<td>up to 8 years, including grace period of 3 years</td>
</tr>
<tr>
<td>FUNCAFÉ</td>
<td>Finance the costs associated to acquisitions of inputs, labor and machine operations</td>
<td>Coffee producers and coffee cooperatives</td>
<td>Funcafé (Fund of Coffee Economy Defense) composed by the contribution quota established by the Law 2.295/86)</td>
<td>8.50%</td>
<td>90 calendar days from the date estimated for the end of harvest</td>
</tr>
<tr>
<td>MODERFROTA</td>
<td>Finance the acquisition of tractors, harvesters, cutters, sprayers, planters, seeders and equipment of preparing, drying and processing of coffee</td>
<td>Rural producers (individual and legal entity) and producers’ cooperatives</td>
<td>BNDES/FINAME</td>
<td>7.5% for clients with an annual return up to R$ 90 million 9.0% for clients with an annual return higher than R$ 90 million</td>
<td>new items: up to 7 years, including grace period of 11 months used items: up to 4 years, including a grace period of 11 months.</td>
</tr>
<tr>
<td>Program Code</td>
<td>Program Name</td>
<td>Description</td>
<td>Eligibility</td>
<td>Financial Institutions</td>
<td>Interest Rate</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>--------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>MODERAGRO</td>
<td>Finance modernization and productivity expansion projects in the agricultural and cattle ranching sectors and for actions aimed at soil recovery and animal defense</td>
<td>Rural producers (individual and legal entity) and rural producers cooperatives</td>
<td>IHCD and BNDES/FINAME</td>
<td>8.50%</td>
<td>10 years, with 3 years of grace period</td>
</tr>
<tr>
<td>MODERINFRA</td>
<td>Support the development of sustainable irrigated agriculture to minimize the production risk and increase agricultural supply, increase the storage capacity of agricultural production and support the modernization of buildings for the storage of machinery, agricultural implements and inputs.</td>
<td>Rural producers (individual and legal entity) and rural producers cooperatives</td>
<td>IHCD and BNDES/FINAME</td>
<td>7.50%</td>
<td>10 years, with 3 years of grace period</td>
</tr>
<tr>
<td>ABC</td>
<td>Finance investments that contribute to the reduction of environmental impacts caused by agricultural activities</td>
<td>Rural producers (individual or legal entity) and producer cooperatives</td>
<td>IHCD and BNDES/FINAME AND CONSTITUTIONAL FUNDS</td>
<td>7.50%</td>
<td>up to 15 years, depending on the project to be financed</td>
</tr>
<tr>
<td>PRODECOOP</td>
<td>Finance the production systems modernization and the commercialization of the agroindustrial complex of Brazilian cooperatives</td>
<td>Single and central cooperatives of production, agroindustrials, aquaculture or fisheries; rural producers (individuals or legal entity) associated to these cooperatives</td>
<td>IHCD and BNDES/FINAME</td>
<td>8.50%</td>
<td>10 years, with 3 years of grace period</td>
</tr>
<tr>
<td>PROCAP-AGRO</td>
<td>Support the recovery or restructuring of agricultural, agroindustrial, aquaculture and fishery cooperatives through financing the payment of quotas and for obtaining working capital</td>
<td>Single and central cooperatives of production, agroindustrials, aquaculture or fisheries; rural producers (individuals or legal entity) associated to these cooperatives</td>
<td>IHCD and BNDES/FINAME</td>
<td>TJLP (long term interest rate) + 3.7%</td>
<td>2 year, with 6 month of grace period</td>
</tr>
<tr>
<td>PSI RURAL</td>
<td>Finance the acquisition of machinery, agricultural equipment and new trucks, being of national manufacture and properly accredited at BNDES</td>
<td>Rural producers (individual or legal entity) and producer cooperatives</td>
<td>Unrestricted resources from BNDES and BNDES/FINAME</td>
<td>7.0% for clients with an annual return up to R$ 90 million 9.5% for clients with an annual return</td>
<td>120 months, with 18 months of grace period</td>
</tr>
<tr>
<td>Program</td>
<td>Objective</td>
<td>Eligibility</td>
<td>Funding Agency</td>
<td>Interest Rate</td>
<td>Duration, with grace period</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td>-------------</td>
<td>----------------</td>
<td>--------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>PCA</td>
<td>Support essential investments for increasing storage capacity by building and expanding warehouses</td>
<td>Rural producers (individual or legal entity) and producer cooperatives</td>
<td>IHCD and BNDES/FINAME</td>
<td>6.50%</td>
<td>15 years, with 3 years of grace period</td>
</tr>
<tr>
<td>INOVAGRO</td>
<td>Support essential investments to technological innovation in rural properties to increase productivity, adoption of good agricultural practices and management, as well as the competitive insertion of rural producers in different consumer markets</td>
<td>Rural producers (individual or legal entity) and producer cooperatives</td>
<td>BNDES/FINAME</td>
<td>6.50%</td>
<td>10 years, with 3 years of grace period</td>
</tr>
<tr>
<td>PRORENOVA RURAL</td>
<td>Finance the renovation and implementation of new sugar cane plantations for sugar and ethanol producers</td>
<td>Sugarcane producers and their cooperatives</td>
<td>Unrestricted resources from BNDES and BNDES/FINAME</td>
<td>TJLP + 3.7%</td>
<td>6 years, with 18 months of grace period</td>
</tr>
<tr>
<td>BNDES AGRO</td>
<td>Support the increase of storage capacity of agro-industries and the acquisition of agricultural aerial sprayers</td>
<td>Producers (individuals or legal entity), national industries, associations, cooperatives and rural foundations, consortium and condominiums with productivity activities</td>
<td>BNDES/FINAME</td>
<td>TJLP + 3.7%</td>
<td>12 years, with 3 years of grace period</td>
</tr>
</tbody>
</table>

Source: BNDES (website e Circular nº 16/2017), MAPA (Plano Safra 16/17), BCB, BNDES, BB e CEF. *Em 2016 teve desembolso, porém já não consta do Plano Safra 2016/2017

higher than R$ 90 million
## Annex 2: Risk management programs

<table>
<thead>
<tr>
<th>Program</th>
<th>Objectives</th>
<th>Beneficiaries</th>
<th>Agents</th>
<th>Budget allocation</th>
<th>Source of funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programa de Subvenção ao Prêmio do Seguro Rural (PSR)</td>
<td>Reduce the cost of insurance (premium) for the producer; increase the use of rural insurance, increasing the number of crops and hectares covered; and stabilize the income of rural producers, reducing the demand for renegotiation and extension of debts; induce the use of technologies and modernize the management of the agricultural enterprises.</td>
<td>Rural producers without a record of impediment within the organs of the federal government, such as debt.</td>
<td>Insurers authorized by MAPA: • Allianz Seguros S.A. • Companhia de Seguros Aliança do Brasil. • Companhia Excelsior de Seguros. • Essor Seguros S.A. • Fairfax Brasil Seguros Corporativos S.A. • Mapfre Seguros Gerais S.A. • Porto Seguro Companhia de Seguros Gerais. • Sancor Seguros do Brasil S.A. • Swiss Re Corporate Solutions Brasil Seguros S.A. • Tokio Marine Seguradora S.A.</td>
<td>Federal government budget provision disclosed in the Safra Plan: R $ 400 Million in 2016/2017; R $ 550 Million in 2017/2018 (a bill is being discussed in the Senate that reduces this amount to R $ 260 million)</td>
<td>Federal government (Fiscal cost in 2016: R $ 782,536,000)</td>
</tr>
<tr>
<td>Programa de Garantia da Atividade Agropecuária (PROAGRO)</td>
<td>To exempt the beneficiary of rural credit from the fulfillment of financial obligations in case of loss of income from natural phenomena, pests and diseases; to promote the use of technology.</td>
<td>Intended for small and medium agricultural production units. The maximum value per crop or purpose for the same beneficiary is currently R $ 300,000. Required for costing operations with controlled resources of up to R $ 300,000 from July 2016.</td>
<td>Financial institutions (FIs) authorized to operate rural credit. Several FIs, however, despite granting rural credit financing, do not carry out the respective framework in Proagro.</td>
<td>Federal government budget provision</td>
<td>Proagro is funded by resources allocated by the federal government and those from the contribution of rural producer (Proagro premium), as well as from the proceeds obtained from the collection of the additional funds. Transfer in 2016 of R $ 1,127,800,000)</td>
</tr>
<tr>
<td>Program</td>
<td>Description</td>
<td>Eligibility</td>
<td>Additional Information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROAGRO Mais</td>
<td>For families within PRONAF, it covers liabilities, indemnification and guarantee of minimum income, in case of extreme climatic events or losses generated by diseases and plague for which there are no widespread control methods.</td>
<td>Intended for family farmers who access agricultural financing linked to PRONAF. Mandatory for those who access PRONAF.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fundo Garantia Safra</td>
<td>To ensure minimum conditions of survival for farmers/family members subject to crop loss due to adverse weather conditions in Northeast and semi-arid areas. Benefit of R $ 850 fixed, paid in 5 installments.</td>
<td>Family farmers with monthly family income of a maximum of 1.5 minimum wages and plant between 0.6 and 5 hectares of beans, corn, rice, cassava, cotton.</td>
<td>The State Coordination of the Garantia Safra sends the payroll of the Guarantee-Safra to the city hall, the unions of rural workers and the local office of the official institution of technical assistance and rural extension on monthly basis. These institutions inform the farmers who joined the GS and the Social Identification Numbers (NIS), on the month and the day when the payment will be made available for withdrawal from the Caixa Econômica Federal and its banking correspondents.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolsa Estiagem</td>
<td>To provide monetary compensation to small farmers not covered by the Garantia Safra, whose plantations were affected by drought.</td>
<td>Family farmers living in municipalities that comply with the rules for the receipt of the Guarantee-Safra Fund, which are in an emergency situation due to drought.</td>
<td>Caixa Econômica Federal (receipt through the citizen card or family purse)</td>
<td>Budgetary provision of the federal government.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Federal government budget provision</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Annex 3: Empirical analysis of impact of reach of rural lending programs

Table A1: Probability of obtaining financing relative to large farms

<table>
<thead>
<tr>
<th>Credit Type:</th>
<th>Free Credit</th>
<th>Free + Earmarked Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Banks:</td>
<td>Private Banks</td>
</tr>
<tr>
<td></td>
<td>Purpose:</td>
<td>Working Capital Financing</td>
</tr>
<tr>
<td>Small Farms</td>
<td>-0.02*** [0.003]</td>
<td>-0.06*** [0.004]</td>
</tr>
<tr>
<td>Medium Farms</td>
<td>-0.01*** [0.002]</td>
<td>-0.05*** [0.003]</td>
</tr>
<tr>
<td>Fixed Effects:</td>
<td>Bank</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Time</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Estate</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>3,161,103</td>
<td>1,461,736</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.10</td>
<td>0.10</td>
</tr>
</tbody>
</table>

This table shows regressions estimating the probability of use of rural credit using transaction-level data aggregated at the municipality-quarter-bank level. The estimates for small and medium farms are benchmarked against large farms. Robust standard errors (reported in brackets) are clustered at the municipality level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

This table shows regressions estimating the probability of use of rural credit using transaction-level data aggregated at the municipality-quarter-bank level. The estimates for small and medium farms are benchmarked against large farms. Robust standard errors (reported in brackets) are clustered at the municipality level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.
Table A2: Term of financing for family farms relative to large farms

<table>
<thead>
<tr>
<th>Terms of Financing:</th>
<th>Interest Rates</th>
<th>Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit Type:</td>
<td>Free Credit</td>
<td>Free + Earmarked Credit</td>
</tr>
<tr>
<td>Banks:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Banks</td>
<td>1.94***</td>
<td>-0.13***</td>
</tr>
<tr>
<td>Public Banks</td>
<td>0.02</td>
<td>-0.39***</td>
</tr>
<tr>
<td>All Banks</td>
<td>1.28***</td>
<td>0.02</td>
</tr>
</tbody>
</table>

| Fixed Effects:      |                |                      |            |              |            |              |
| Bank                | Yes            | Yes                  | Yes        | Yes          | Yes        | Yes          |
| Time                | Yes            | Yes                  | Yes        | Yes          | Yes        | Yes          |
| Estate              | Yes            | Yes                  | Yes        | Yes          | Yes        | Yes          |
| Observations        | 192,711        | 40,469               | 492,748    | 256,173      | 192,711    | 40,469       |
| R-squared           | 0.42           | 0.42                 | 0.59       | 0.78         | 0.37       | 0.51         |

This table shows regressions estimating the differences in the terms of financing (loan interest rates and maturity) for small and medium farms relative to large farms. The analysis use transaction-level data aggregated at the municipality-quarter-bank level. The regressions control for whether the share of loans with posted collateral. Robust standard errors (reported in brackets) are clustered at the municipality level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.
Table A3: Informational spillovers: Likelihood of obtaining a free-market loan after an earmarked loan

<table>
<thead>
<tr>
<th></th>
<th>(1) Individuals</th>
<th>(2) Individuals</th>
<th>(3) Individuals</th>
<th>(4) Firms</th>
<th>(5) Firms</th>
<th>(6) Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>After Earmarked</td>
<td>-0.777***</td>
<td>-0.709***</td>
<td>-0.633***</td>
<td>-0.766***</td>
<td>-0.461***</td>
<td>-0.437***</td>
</tr>
<tr>
<td></td>
<td>(0.028)</td>
<td>(0.046)</td>
<td>(0.051)</td>
<td>(0.033)</td>
<td>(0.134)</td>
<td>(0.137)</td>
</tr>
<tr>
<td>Log(maturity)</td>
<td>-0.090***</td>
<td>-0.099***</td>
<td>-0.089***</td>
<td>-0.087***</td>
<td>-0.041*</td>
<td>-0.011</td>
</tr>
<tr>
<td></td>
<td>(0.025)</td>
<td>(0.028)</td>
<td>(0.034)</td>
<td>(0.030)</td>
<td>(0.021)</td>
<td>(0.015)</td>
</tr>
<tr>
<td>Public Banks</td>
<td>0.062*</td>
<td>0.075*</td>
<td>-0.015</td>
<td>0.160**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.037)</td>
<td>(0.039)</td>
<td>(0.038)</td>
<td>(0.078)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Banks</td>
<td>0.089***</td>
<td>0.102***</td>
<td>-0.053</td>
<td>0.120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.018)</td>
<td>(0.026)</td>
<td>(0.032)</td>
<td>(0.097)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>8,132,674</td>
<td>7,737,611</td>
<td>7,404,310</td>
<td>1,302,327</td>
<td>1,285,070</td>
<td>1,282,081</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.410</td>
<td>0.537</td>
<td>0.651</td>
<td>0.547</td>
<td>0.648</td>
<td>0.676</td>
</tr>
<tr>
<td>Farm FE</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Farm*Bank</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The table shows the likelihood of obtaining a free-market loan after the individual or firm has received its first earmarked credit:

\[ Pr(\text{Loan} = \text{Free market}) = \alpha_0 + \alpha_1 \text{After Earmarked}_f + \beta \text{C}_f + \mathcal{F} + u_{ftb} \]

*After Earmarked* is an indicator variable at the borrower level that is equal to one if farm has received earmarked loans in the past. The coefficient \( \alpha_1 \) in Equation identifies whether new rural loans to the borrower are more likely to be free-market credit after an earmarked lending relationship has been established. *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

Table A4. Earmarked vs. non-earmarked loans by bank type

<table>
<thead>
<tr>
<th>Borrower</th>
<th>Type of Credit</th>
<th>Amount (Rs 100,000)</th>
<th>Interest Rate (%)</th>
<th>Maturity (years)</th>
<th>Relationship Duration (years)</th>
<th>Rating</th>
<th>Borrower Size</th>
<th>Firm age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel A. Public Banks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individuals</td>
<td>Free-market</td>
<td>1.9</td>
<td>7.0</td>
<td>3.5</td>
<td>13.1</td>
<td>20.8</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Earmarked</td>
<td>0.8</td>
<td>4.0</td>
<td>3.1</td>
<td>13.6</td>
<td>13.0</td>
<td>5.8</td>
<td></td>
</tr>
<tr>
<td>Firms</td>
<td>Free-market</td>
<td>21.1</td>
<td>21.3</td>
<td>1.7</td>
<td>11.7</td>
<td>7.6</td>
<td>2.6</td>
<td>38.5</td>
</tr>
<tr>
<td></td>
<td>Earmarked</td>
<td>19.9</td>
<td>11.1</td>
<td>1.1</td>
<td>15.2</td>
<td>10.2</td>
<td>3.3</td>
<td>33.2</td>
</tr>
<tr>
<td>Panel B. Private Banks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individuals</td>
<td>Free-market</td>
<td>2.5</td>
<td>11.6</td>
<td>1.3</td>
<td>13.0</td>
<td>15.3</td>
<td>6.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Earmarked</td>
<td>1.1</td>
<td>6.4</td>
<td>2.9</td>
<td>7.9</td>
<td>10.6</td>
<td>4.8</td>
<td></td>
</tr>
<tr>
<td>Firms</td>
<td>Free-market</td>
<td>4.7</td>
<td>7.9</td>
<td>1.1</td>
<td>14.3</td>
<td>7.9</td>
<td>3.4</td>
<td>23.1</td>
</tr>
<tr>
<td></td>
<td>Earmarked</td>
<td>2.3</td>
<td>5.0</td>
<td>1.1</td>
<td>15.9</td>
<td>5.6</td>
<td>3.2</td>
<td>22.0</td>
</tr>
<tr>
<td>Panel C. Credit Cooperatives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individuals</td>
<td>Free-market</td>
<td>0.6</td>
<td>22.4</td>
<td>1.4</td>
<td>9.0</td>
<td>13.0</td>
<td>6.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Earmarked</td>
<td>0.5</td>
<td>5.3</td>
<td>1.4</td>
<td>10.6</td>
<td>12.9</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>Firms</td>
<td>Free-market</td>
<td>3.6</td>
<td>25.8</td>
<td>1.6</td>
<td>5.8</td>
<td>12.4</td>
<td>2.0</td>
<td>41.9</td>
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<tr>
<td></td>
<td>Earmarked</td>
<td>4.9</td>
<td>5.6</td>
<td>2.8</td>
<td>10.0</td>
<td>12.0</td>
<td>2.0</td>
<td>38.2</td>
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### Table A5. Earmarked vs. free-market credit: differences between loan conditions and borrower bank-relationship

<table>
<thead>
<tr>
<th>Dependent Variable =</th>
<th>Interest Rate</th>
<th>Loan amount</th>
<th>Maturity</th>
<th>Rating</th>
<th>Relationship Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A. Private Banks to Firms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earmarked Credit</td>
<td>-0.822</td>
<td>-281***</td>
<td>0.032</td>
<td><strong>-0.92</strong>*</td>
<td>1.2**</td>
</tr>
<tr>
<td></td>
<td>(1.344)</td>
<td>(71.1)</td>
<td>(0.036)</td>
<td><strong>(0.310)</strong></td>
<td>(0.531)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,014,349</td>
<td>1,014,364</td>
<td>1,014,350</td>
<td>1,014,365</td>
<td>1,014,365</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.612</td>
<td>0.416</td>
<td>0.847</td>
<td>0.795</td>
<td>0.888</td>
</tr>
<tr>
<td><strong>Panel B. Private Banks to Individuals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earmarked Credit</td>
<td>-1.57***</td>
<td>-83.7</td>
<td>0.508</td>
<td><strong>-2.726</strong></td>
<td>-0.141</td>
</tr>
<tr>
<td></td>
<td>(0.472)</td>
<td>(86.35)</td>
<td>(0.345)</td>
<td><strong>(1.210)</strong></td>
<td>(0.105)</td>
</tr>
<tr>
<td>Observations</td>
<td>875,461</td>
<td>875,461</td>
<td>875,036</td>
<td>875,479</td>
<td>875,479</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.407</td>
<td>0.447</td>
<td>0.814</td>
<td>0.676</td>
<td>0.729</td>
</tr>
<tr>
<td><strong>Panel C. Credit Cooperatives to Firms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earmarked Credit</td>
<td>-12.135***</td>
<td>83.942</td>
<td>0.379***</td>
<td><strong>0.562</strong></td>
<td>-0.030</td>
</tr>
<tr>
<td></td>
<td>(1.246)</td>
<td>(114.9)</td>
<td>(0.052)</td>
<td><strong>(-0.205)</strong></td>
<td>(0.022)</td>
</tr>
<tr>
<td>Observations</td>
<td>20,002</td>
<td>20,059</td>
<td>20,002</td>
<td>20,059</td>
<td>20,059</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.550</td>
<td>0.660</td>
<td>0.851</td>
<td>0.668</td>
<td>0.929</td>
</tr>
<tr>
<td><strong>Panel D. Credit Cooperatives to Individuals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earmarked Credit</td>
<td>-17.508***</td>
<td>14.30*</td>
<td>0.407***</td>
<td>0.007</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>(1.469)</td>
<td>(8.51)</td>
<td>(0.042)</td>
<td>(0.081)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,363,104</td>
<td>2,393,094</td>
<td>2,391,157</td>
<td>2,393,094</td>
<td>2,393,093</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.240</td>
<td>0.619</td>
<td>0.712</td>
<td>0.549</td>
<td>0.889</td>
</tr>
</tbody>
</table>

Notes: The table estimates the credit conditions of a loan and compares between earmarked and non-earmarked credit: \( y_{lfbt} = \alpha_0 + \alpha_1Earmarked\ Loan_{lfbt} + \beta C_{lt} + F + u_{lfbt} \). \( l \) represents a loan, \( f \) is the borrower (or farm), and \( b \) is the bank. Credit outcomes are interest rate, loan amount, maturity, rating, and firm-bank relationship duration. Earmarked Credit is an indicator variable that equals one if the loan is and earmarked loan and zero otherwise. All regressions include borrower and type of credit fixed effects. Standard errors are clustered at the bank*time level.
Annex 4: Fiscal costs

Table A6: Fiscal costs of agricultural programs (R$ billion)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PRONAF (equalized)</td>
<td>2.20</td>
<td>2.36</td>
<td>1.71</td>
<td>0.46</td>
<td>9.78</td>
<td>5.24</td>
<td>4.09</td>
</tr>
<tr>
<td>Equalization of rural and agri investments</td>
<td>0.00</td>
<td>0.07</td>
<td>0.32</td>
<td>0.07</td>
<td>2.50</td>
<td>2.97</td>
<td>2.18</td>
</tr>
<tr>
<td>Equalization of agricultural extension</td>
<td>0.92</td>
<td>1.36</td>
<td>0.13</td>
<td>0.64</td>
<td>5.18</td>
<td>1.82</td>
<td>2.04</td>
</tr>
<tr>
<td>Other explicit</td>
<td>1.28</td>
<td>1.12</td>
<td>1.08</td>
<td>1.77</td>
<td>5.02</td>
<td>3.42</td>
<td>2.82</td>
</tr>
<tr>
<td>Federal loans to BNDES</td>
<td>0.74</td>
<td>0.90</td>
<td>1.04</td>
<td>1.90</td>
<td>1.91</td>
<td>4.59</td>
<td>3.18</td>
</tr>
<tr>
<td>Constitutional Funds</td>
<td>3.15</td>
<td>3.63</td>
<td>3.73</td>
<td>4.36</td>
<td>6.61</td>
<td>9.64</td>
<td>5.95</td>
</tr>
<tr>
<td>Other implicit</td>
<td>1.67</td>
<td>1.60</td>
<td>1.35</td>
<td>0.63</td>
<td>2.11</td>
<td>2.21</td>
<td>2.74</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>9.96</td>
<td>11.05</td>
<td>9.37</td>
<td>9.83</td>
<td>33.11</td>
<td>29.88</td>
<td>22.71</td>
</tr>
<tr>
<td><strong>Total/GDP (%)</strong></td>
<td>0.23</td>
<td>0.23</td>
<td>0.18</td>
<td>0.17</td>
<td>0.55</td>
<td>0.48</td>
<td>0.35</td>
</tr>
</tbody>
</table>

Note: Other explicit includes PSI and Budget subsidies for insurance programs; other implicit includes FUNCAFE, PESA, PROEX. Source: Ministerio da Fazenda, Seae

Annex 5: Matching Grants

106. **Matching grants to smallholder farmers are a useful and commonly used alternative to interest rate subsidies.** A matching grant is defined as “a one-off, non-reimbursable transfer to project beneficiaries, for a specific purpose, based on the condition that the recipient contributes for the same purpose”\(^{65}\). These grants can be used for a variety of activities including technical assistance, which seems to be particularly relevant for the development of farms and firms,\(^ {66}\) investment in assets or financing of working capital. With this, matching grants are an instrument that can reach farms and MSMEs that do not take out loans for any reason.

107. **There is ample and well documented experience with matching grants in Brazil\(^ {67}\) and other countries, where such programs have been implemented with success, mainly as a tool to promote MSMEs and farms.** While such programs face significant risks (e.g. lack of additionality, if they provide funding for investments that would have been carried out in any case, lack of sustainability of

\(^{65}\) See IFAD, 2012, Matching grants technical note

\(^{66}\) A recent WB study on the growth of agricultural productivity in Brazil concludes that “in both, South and Northeast regions, technical assistance was more strongly associated with gains in land productivity and income than was credit.” See: Arias et al. “Agriculture Productivity Growth in Brazil”, World Bank Sept 2017

\(^{67}\) E.g. the ATER program for family farmers that has a target to serve 128,000 families and 1,000 cooperatives with technical assistance in 2017. See Plano Safra da Agricultura Familiar 2017 / 2020 SEAD .
investments and misallocation of public resources), the analysis of the implementation of such programs shows that their success is closely related to several factors, which include, among other:

- The size of the grant;
- The level of grant matching by beneficiaries, which should be lower in the case of more commercial beneficiaries with access to external funding and higher in the case of beneficiaries not yet integrated in the product and financial markets;
- The level of involvement of financial entities in their design and management, which can have significant implications for the future access of beneficiaries to financial services; and
- The provision of technical assistance to design investments;
- the incorporation of mechanisms that allow beneficiaries to make educated choices when selecting the goods and services to be purchased with help of these grants; and
- The incorporation of adequate monitoring mechanisms to oversee the programs’ development and success.

Annex 6: Partial Credit Guarantee schemes, the experience of FOGAPE in Chile

108. FOGAPE is a Chilean credit guarantee scheme funded by the national government and administered by Banco Estado, a large, state-owned commercial bank. FOGAPE provides credit guarantees to financial institutions for loans to microenterprises (defined as those with less than US$100,000 in annual sales) and small firms (up to US$1 million in annual sales).

109. FOGAPE has been able to provide partial credit guarantees on a relatively large scale while maintaining an adequate portfolio performance and achieving financial sustainability, the main factors for success being:

- FOGAPE’s market-oriented approach, focusing on the long-term goal of achieving the sustainable deepening of financial markets for micro and small firms, instead of trying to increase the amount of credit that these firms receive, as has traditionally been the focus of state interventions in this area. FOGAPE considers financial institutions as its primary clients and sees its role as providing products and services that assist these institutions in their commercial operations. It has developed close relationships with banks, interacting with them frequently through monthly meetings with all participating financial institutions and through bilateral meetings with specific institutions. This close relationship has allowed FOGAPE to adapt the design of its guarantees to meet the needs of banks in serving micro and small firms. As a result, senior managers and those in charge of SME lending at participating banks consider FOGAPE a

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69 See World Bank 2017, Rachel Sberro-Kessler: “How can Matching Grants in Agriculture facilitate access to finance?”

65
valuable partner. FOGAPE has developed specialized knowledge of the market for micro and small firms and has close relationships with the different government agencies and support networks that serve these firms and uses this knowledge to provide training for frontline staff in financial institutions on how to use its products.

- **FOGAPE is supervised and externally audited and its guarantees are recognized by the supervisor as risk mitigator for provisioning and capital adequacy, providing an additional strong incentive to lenders to use its guarantees.**

- **In addition, several design features have allowed FOGAPE to expand its outreach while remaining financially sustainable:**
  - Simplified procedures to register loans and to process claims make guarantees more transparent and liquid. FOGAPE’s guarantees are paid out in full within 15 days of the claim being made, making the scheme attractive for financial institutions.
  - FOGAPE manages to maintain low administrative costs by letting financial institutions decide which loans to guarantee and by relying on the financial institutions’ loan management procedures (which are assessed in detail).
  - The use of several mechanisms to encourage lenders to carefully screen and monitor guaranteed loans: (i) guarantees are only partial, covering at most 80 percent of the value of individual loans; (ii) guarantees are auctioned on the basis of the coverage rate offered by financial institutions, which fosters competition and pushes the coverage ratio down (FOGAPE offers a fixed volume of guarantees and each financial institution submits secret bids requesting guarantees for a certain volume of loans with a given coverage ratio); and (iii) the definition of fees tied to each financial institutions loan portfolio performance.

110. **One of the important questions regarding FOGAPE, is whether it has achieved the desired policy objectives of generating financial and economic additionality.** The research by Larraín and Quiroz (2006); Alvarez, Belmar, and Opazo (2015); and Cowan, Drexler, and Yañez (2015) discussed above shows that FOGAPE’s guarantees led to higher bank lending to micro and small firms. On the other hand, Benavente, Galetovic, and Sanhueza (2006) suggest that banks are not necessarily using FOGAPE as a temporary subsidy to learn about the creditworthiness of new borrowers but rather just to reduce their credit risk exposure when lending to borrowers with which they are already familiar.

111. **In 2015, the World Bank and FIRST launched a new tool to help governments implement public credit guarantee schemes** (World Bank 2015a). The tool is intended to become the standard for effectively and efficiently establishing and running public credit guarantee schemes (CGSs) for SMEs around the world. The 16 principles cover four key areas that are critical for the success of CGSs. The principals are: 1. Establish the CGS as an independent legal entity; 2. Provide adequate funding and keep sources transparent; 3. Promote mixed ownership and treat minority shareholders fairly; 4. Supervise the CGS independently and effectively; 5. Clearly define the CGS mandate; 6. Set a sound corporate governance structure with an independent board of directors; 7. Design a sound internal control framework to safeguard the operational integrity; 8. Adopt an effective and comprehensive enterprise risk management framework; 9. Clearly define eligibility and qualification criteria for SMEs, lenders, and credit instruments; 10. Ensure the guarantee delivery approach balances outreach, additionality, and financial sustainability; 11. Issue partial guarantees that comply with prudential regulation and provide capital relief to lenders; 12. Set a transparent and consistent risk-based pricing policy; 13. Design an efficient, clearly documented, and transparent claim management process; 14. Set rigorous financial reporting requirements and externally audit financial statements; 15. Publicly
disclose non-financial information periodically; 16. Systematically evaluate the CGS’ performance and publicly disclose the findings.

Annex 7: Principles for Public Credit Guarantee Schemes (PCGs)

<table>
<thead>
<tr>
<th>In 2015, the World Bank Group published 16 principles cover four key areas that are critical for the success of PCGs.71</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Legal and regulatory framework</strong></td>
</tr>
<tr>
<td>1. Establish the PCG as an independent legal entity.</td>
</tr>
<tr>
<td>2. Provide adequate funding and keep sources transparent.</td>
</tr>
<tr>
<td>3. Promote mixed ownership and treat minority shareholders fairly.</td>
</tr>
<tr>
<td>4. Supervise the PCG independently and effectively.</td>
</tr>
<tr>
<td><strong>Corporate governance and risk management</strong></td>
</tr>
<tr>
<td>5. Clearly define the PCG mandate.</td>
</tr>
<tr>
<td>6. Set a sound corporate governance structure with an independent board of directors.</td>
</tr>
<tr>
<td>7. Design a sound internal control framework to safeguard the operational integrity.</td>
</tr>
<tr>
<td>8. Adopt an effective and comprehensive enterprise risk management framework.</td>
</tr>
<tr>
<td><strong>Operational framework</strong></td>
</tr>
<tr>
<td>9. Clearly define eligibility and qualification criteria for recipients, lenders, and credit instruments.</td>
</tr>
<tr>
<td>10. Ensure the guarantee delivery approach balances outreach, additionality, and financial sustainability.</td>
</tr>
<tr>
<td>11. Issue partial guarantees that comply with prudential regulation and provide capital relief to lenders.</td>
</tr>
<tr>
<td>12. Set a transparent and consistent risk-based pricing policy.</td>
</tr>
<tr>
<td>13. Design an efficient, clearly documented, and transparent claim management process.</td>
</tr>
<tr>
<td><strong>Monitoring and evaluation</strong></td>
</tr>
<tr>
<td>14. Set rigorous financial reporting requirements and externally audit financial statements</td>
</tr>
<tr>
<td>15. Publicly disclose non-financial information periodically.</td>
</tr>
<tr>
<td>16. Systematically evaluate the PCG’s performance and publicly disclose the findings.</td>
</tr>
</tbody>
</table>

Annex 8: International experiences in agricultural insurance: PPPs and Risk layering

**Worldwide, most agricultural insurance programs that have scaled up are Public Private Partnerships.** Few functions are exclusively public sector or exclusively private sector functions, but rather shared functions. The full participation of the private sector is critical for the successful implementation of an agriculture insurance program.

- The following are principally private sector functions: (i) product design and rating, (ii) risk acceptance and underwriting, (iii) decisions over risk retention and reinsurance strategies, (iv) supplementary data collection and (v) the marketing and (vi) distribution of crop and livestock insurance products.
- On the other hand, Governments can support agricultural insurance by: (i) providing an adequate regulatory framework; (ii) supporting the collection / availability of good quality data on risk factors (prominently climate) and yields; (iii) educating potential policy holders about the nature of insurance

and its potential benefits / costs; (iv) establishing adequate consumer protection mechanisms; and (v) providing subsidies to premiums, administrative costs and/or stop-loss measures.

In the major PPP agricultural insurance programs that operate in countries such as the USA, Canada, Spain and Turkey, agricultural insurance provision is enshrined by a law that integrates the various policies and programs covering both, catastrophic insurance (with special focus on vulnerable populations) and regular agricultural insurance: (i) In the United States, the government continues to provide public sector disaster relief in addition to highly subsidized crop insurance; (ii) In Mexico, the CADENA program allows State Governments to purchase insurance to protect their budgetary allocations against natural disaster compensation for the most vulnerable farmers; (iii) In Spain, the government has replaced ad hoc natural disaster compensation programs with ex ante formal crop and livestock insurance programs implemented by the private insurance sector and promoted and supported by the government through provision of premium subsidies or reinsurance protection; The law specifically excludes any post-disaster payments for natural disasters that are covered by the national agricultural insurance program. These examples are briefly presented in the following:

**Agricultural insurance in the USA**

In the USA, the Federal Crop Insurance Program (FCIP) is implemented under the framework of the Federal Crop Insurance Act, the Farm Bill and the Agricultural Risk Protection Plan. This legislation clearly sets out the roles and responsibilities of the private commercial insurers, crop and livestock producers eligibility for premium subsidies, governments’ roles in product design and rating, the provision of subsidies and government’s role in providing reinsurance protection through the Standard Reinsurance Agreement (SRA) and Livestock Price Reinsurance Agreement (LPR). Legislation also stipulates the role of the Risk Management Agency (RMA), which is a Federal agency under USDA. The RMA is responsible for approving all new crop and livestock products and programs, for maintaining a national data base of crop insurance underwriting and claims results and for advising on the actuarial rates for each crop and livestock program in each county and state. Furthermore, RMA manages the various premium subsidy programs including (i) producer premium subsidies, (ii) subsidies to cover the Insurers’ administration and operating expenses and finally (iii) subsidies on loss adjustment costs. RMA is also responsible for implementing research and development into new products and programs and for grower outreach, training and education programs. In the USA there is explicit linkage between agricultural insurance and public disaster assistance programs through the requirement that a farmer must first purchase a minimum level of catastrophe protection under FCIP to be eligible for additional disaster relief.

Established in 1938 to help agricultural producers recover from the Great Depression, the agricultural insurance program in the USA is the largest in the world. The United States offer two large crop insurance programs (FCIP, which provides subsidized MPCI, and a private commercial nonsubsidized crop hail program) as well as a much smaller livestock insurance program. Together these programs account for 56 percent of total global agricultural insurance premium volume and 5.2 percent of agricultural GDP in the United States.

There are two basic types of crop insurance policies offered through the federal crop insurance program: revenue policies protect against shortfalls in revenue due to low crop yields, lower-than-expected crop prices at harvest, or both, and, yield policies, which protect only against losses due to low crop yields. Revenue policies are more popular among agricultural producers, accounting for nearly 80 percent of all policies offered through the program.
The program has a high coverage, both in terms of eligible area and products. The program covers close to 300 million acres or 85 percent of eligible area. Although federally subsidized insurance is available for more than 130 crops, four crops—corn, soybeans, wheat, and cotton—comprise nearly three-quarters of the enrolled acreage, four-fifths of the claims paid, and nearly 75 percent of the dollar value of total U.S. crop production in 2016.

Federal costs for crop insurance averaged $8.7 billion annually over the past five years, with estimated annual costs for federal crop insurance averaging $7.7 billion for fiscal years 2018 through 2027. Among the three main components of the federal government’s cost for the crop insurance program—premium subsidies, administrative and operating reimbursements, and underwriting losses and gains—premium subsidies are the most expensive. Over the past five years, on average, they accounted for $6.7 billion annually; reimbursements for administrative and operating costs amounted to $1.5 billion; and the federal government’s share of underwriting losses was $0.3 billion (CBO 2017).

The schemes subsidizing agricultural insurance in the USA are however associated with several challenges that include:

- **Sub-optimal targeting**: Research that farms in the top 10 percent of the crop sales distribution received approximately 68 percent of all crop insurance premium subsidies in 2014
- **Distortion of agricultural practices towards riskier less sustainable practices**: subsidized crop insurance has been shown to affect crop choice and production practices and lead to shifting highly erodible lands from pasture and grazing to crop production. Those impacts have generated environmental and trade concerns.

**The CADENA program in Mexico**

The Mexican Agricultural Fund for Natural Disasters (CADENA) aims to internationally reinsurance part of the costs of its state managed relief programs. CADENA was launched in 2003 by the Ministry of Agriculture and contains two main components: a) the Catastrophe Agricultural Insurance (SAC) program for farmers, livestock producers, aquaculture farmers and fishermen; and b) in States where SAC is not provided, direct compensation payments to farmers in the event of natural disasters. Under the program, State Governments purchase insurance to protect their budgetary allocations against natural disaster compensation for the most vulnerable farmers. The states are the insured, and the premiums are financed by the federal and state governments. Payments are made against a number of indices. Small-scale, low-income farmers without access to commercial crop, livestock, or aquaculture insurance are the intended beneficiaries of the insurance coverage, and the program is designed to provide a minimum level of compensation to smallholder farmers to put them back into production following a major catastrophic event. In 2011, the CADENA program insured about 8 million hectares of crops and slightly over 4.2 million head of livestock. There were around 2.5 million beneficiaries and the total sum insured was approximately US$ 1 billion. CADENA is part of a larger national program – the Fund for Natural Disasters (FONDEN), which transfers part of its risk to the international market through reinsurance and the issuing of catastrophe bonds.

**The Combined Agricultural Insurance Program in Spain**

This program was created under the Law of 28 December 1978 (Ley 87/1978, de 28 de diciembre, de Seguros Agrarios Combinados). It is a national PPP agreement between national and regional governments, producer associations and interested insurers to underwrite subsidized voluntary agricultural crop, livestock, forestry and fisheries (aquaculture) insurance. The program is a Pool program
which is underwritten by a managing underwriting company AGROSEGURO on behalf of about 28 private
and mutual insurance companies and the national catastrophe reinsurer Consorcio de Compencacion de
Seguros, CCS. The 1978 Insurance Act led to the creation of the State Agricultural Insurance Agency
(Entidad Estatal de Seguros Agrarios, ENESA) which is responsible for drawing up the three year and
annual combined agricultural insurance plan and budget in conjunction with the regional governments
and producer associations and then in advising government of the funding requirements. ENESA is also
responsible for insurance program design and the setting of rates with the AGROSEGURO underwriters
and then in administering the premium subsidies.