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**Failing synergies among public programs:  
the economy-wide effects of one rural credit and two social  
protection programs simultaneously implemented in Southern Brazil**

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## 7 Summary, conclusion and policy implications

### 7.1 Summary of the study

Many initiatives around the globe arise to improve the living conditions of poor farmers, especially in developing countries. Different modalities of intervention have been deployed, such as financial support to productive and non-productive rural activities, special credit lines and crop insurance schemes, and access to markets, as well as cash-based programs, especially targeting poor rural households. These programs can be divided into agricultural development, and social protection programs. The former programs focus on improving productivity in crops and improving access to markets, influencing the composition and scale of crops, affecting farm production and productivity, and finally farm income. Social protection programs aim to reduce socio-economic risks, vulnerability, extreme poverty and deprivation, but also stimulate investment in agricultural inputs, and thus improving farm production.

The assessment of program impacts has grossly focused on direct effects produced on beneficiary households, and little attention has been given to the effects of concomitant program implementation in rural areas. Most of the studies fail to analyze the economy-wide impacts produced by the programs. The econometric approach often used comes short of analyzing the impact of programs on non-participants, given the economic linkages among economic sectors, and fails to simulate the impact of policy changes.

The same can be said about the Brazilian rural credit program PRONAF, and the social protection programs *Bolsa Família* and rural pension programs. The reviewed literature on the public programs clearly shows that PRONAF produces positive impacts on farm productivity and production, and on farm income of participating farms. Furthermore, *Bolsa Família* and rural pension programs undoubtedly positively affect household income and food security, especially of poor and vulnerable participating households. However, scrutiny reveals that all reviewed studies focused on beneficiaries, while spillover effects as well as impact on economic linkages remain understudied. Hence, this study applied a methodology to assess the economy-wide impacts generated by public programs implemented in rural areas.

For that scope, first we determined representative households according to their role in the village economy. The choice of not relying on program participation for grouping households was based on the absence of clear-cut homogeneous participant household groups for the different programs. Furthermore, given our interest in assessing the economy-wide impacts of program implementation in a rural economy, it seems reasonable to assess the effects of public programs on household groups based on the activities they are engaged in to make their living.

With the representative households at hand, we followed with building a social accounting matrix of the Rincão dos Maia village, a rural community in Southern Brazil. The SAM was constructed using the data collected from 101 households, and covered all of the most important and representative village activities. With the SAM, we described the structure of the village economy, giving attention to the village activities, commodity and factor markets, and household income and expenditure, as well as savings and foreign trade. Additionally, the estimation of the village SAM enabled us to estimate and present the results of the SAM multipliers, which are important to understand the transmission of exogenous shocks throughout the economy.

Finally, a village CGE model was calibrated using the STAGE CGE model, based on the information systematized previously in the SAM. The CGE allows to integrate nonlinearities in the model, such as for the consumption of goods by households or in the production decisions by farmers, inserting constraints on resource availability (e.g. land or labor), and letting prices playing a role in the transmission of policy shocks throughout the economy. Furthermore, as CGE models allow to simulate the effects of policy changes, seven simulations were implemented, in which the effects of the implementation of different program combinations, were assessed.

### 7.2 Empirical findings

The empirical findings of this research is a summary of the findings discussed at the end of every chapter. Special attention is given to the results of the village CGE model.

First of all, the literature review clearly revealed a gap in (i) assessing of indirect effects produced by PRONAF, *Bolsa Família* and rural pension programs, and in (ii) assessing the effects of concomitant program implementation in rural economies. The reviewed literature on the public programs shows that PRONAF produces positive impacts on farm productivity and production, and on farm income of participating farms. Furthermore, *Bolsa Família* and rural pension programs undoubtedly positively affect household income and food security, especially of poor and vulnerable participating households. However, the complete silence about indirect program effects, and the timid efforts to analyze the outcomes of concomitant program implementation fail, by far, to assess properly the impacts of policies implemented in rural Brazil.

Second, the analysis of livelihood strategies revealed that there are four heterogeneous groups of households in the Rincão dos Maia village. The four groups are (i) poor and mostly landless households, (ii) peach and livestock producers, (iii) mostly tobacco producers, and (iv) elderly households. Beyond the differences in income-generating activities executed by each household, upon which the livelihood strategy was estimated, the household groups also differ in their engagement in local commodity and labor markets, as well as in public program participation. The beneficiaries of rural credit (PRONAF) are mostly among the members of the peach, livestock and tobacco producers, and *Bolsa Família* beneficiaries are especially concentrated in the group of poor and mostly landless households, with few beneficiaries among the tobacco producers. The pension beneficiaries are spread across all household groups, but logically among the elderly household group. Therefore, even though we declined from splitting households according to their program participation, the livelihood strategy strongly explains the choice on household participation on public programs.

Third, the estimation of the village SAM allowed the systematization of flows and interlinkages among economic sectors and village households. The village economy is highly dependent on agriculture, with crop production playing a central role in the generation of wealth, especially through tobacco and peach cultivation. Moreover, most of the village household engage in production activities for home consumption, either in the form of crop or livestock activities, or

through homestead gardening. Some crop products are also produced and used for feeding animals, especially maize, but with many other crop products also used as intermediate goods in livestock production. The big majority of crop products is exported to the regional markets, especially tobacco and peach. Livestock sales are mostly directed to the local slaughterhouse, which in turn sells exports most of the processed meat to households from the neighboring villages. The demand for village production factors is especially high for exchanged and off-farm labor by village crop activities. Family labor is the single highest contributor to household income across all household groups, while off-farm labor contributes significantly to income of poor households. Household income is complemented by government transfers through the *Bolsa Família* and the rural pension programs, the former targeted especially towards the poorest households, and the latter to the senior household group. The following SAM multiplier analysis revealed that the linkages among village activities are weak, especially due to the high demand of imported intermediate inputs in the agricultural activities, with very low involvement of other village activities in its production and/or retail. The multiplier effects of village activities on household income is smaller than one in regard of crop production, retail, and the slaughterhouse, while it is greater than one for all other activities. Especially in the case of crop production, which is by far the most important economic activity in the village, these results hints at the limited potential of cropping activities to foster growth in the village economy. An increase in household income generate varying outcomes: while an increase in poor and senior households' income produce multipliers greater than one in the demand for commodities, an increase in the income of cash crop producing households result in an increase in demand commodity demand slightly smaller than unity. Furthermore, household income also weakly affect village activities, as in increase in income results only in an increase in the demand for village activities smaller than 0.5, and is especially low for cash-crop producing households. Nevertheless, the increase in activity demand is translated into a higher demand for village production factors, affecting factor, and finally household income, especially of poor and senior households. Overall, an increase in direct household transfers through the social protection programs produce the highest impacts on the demand for commodities, on household income, and overall GDP growth. An increase in PRONAF subsidies induce the

highest impacts on the demand for village activities, especially in crop production, but does not produce better GDP outcomes, given the weak linkages between the village activities and other economic sectors. Remarkably, no combination of increase in program budget produces a better outcome as compared with the increase in the budget of the individual programs.

Finally, the CGE calibration and policy shock simulations confirmed the results of the scenarios tested under the SAM multiplier analysis done previously, showing that the cash transfer programs, especially the rural pension program, generates the higher outcome in terms of commodity consumption, household income, and finally on village GDP. Additional budget for *Bolsa Família* produces slightly lower results as compared with the rural pensions, but clearly benefits the poorest group of households, which concentrates most of *Bolsa Família* beneficiaries. The policy simulations considering additional budget for PRONAF had the highest effect on activities, especially on the ones that were originally receiving the PRONAF subsidies. However, given the weak linkages between village activities and other economic sectors (especially households), the overall economic effects remained small, and were the smallest among the tested simulations. There was no combination of program implementation, which earned better results as compared with the results earned by the additional budget for the individual programs. This clearly shows that there are no synergies among the public programs tested in this research.

Against our initial hypothesis, there are no synergies whatsoever in any combination of program implementation in Brazilian rural areas. The effects produced by the individual programs on the labor and commodity markets, as highlighted in this economy-wide analysis, clearly show that the production and consumption linkages influenced by the public programs are relatively weak. Furthermore, while the simulated policy changes affect the household commodity and labor demand and supply, they do not necessarily enter the local market, such as in the case of subsistence production and family labor. As such, the combination of weak linkages of household production for and consumption from the local market, and the strong subsistence production and reliance on family labor, limit the potential of creating synergetic

outcomes from the simultaneous implementation of PRONAF, *Bolsa Família* and rural pension/BPC.

### 7.3 Policy implications

The impacts produced by concomitant implementation of public programs assessed in this research have high policy relevance, as they bear the potential to adjust public program implementation as to optimize the use of public funds. Moreover, it allows for the configuration of policy changes as to potentially increasing outcomes for the target population and for rural economies. Overall, four policy implications resulting from this study are identified.

First of all, PRONAF subsidies should target activities linked to the provision of commodities destined for local sales and for household subsistence. As it is now, regardless of the formal prohibition in the use of PRONAF loans for tobacco production, most of the farming households accessing the rural credit, and therefore benefitting from subsidized interest rates, are activities strongly linked to tobacco production. Given the high reliance on foreign trade for the supply of intermediate goods (crop inputs and investment demand) and for export of crop commodities, the benefits of PRONAF subsidies to the local economy are relatively low. Furthermore, the subsidies have a strong negative effect on the production of livestock and homestead gardening goods, which are highly important commodities for household consumption. Thus, PRONAF loans should be targeted to activities, which have stronger linkages to other economy sectors and direct links to household consumption, especially livestock and homestead gardening production.

Second, the increase in direct transfers to households through the social protection programs have a strong effect on household consumption, especially of processed food and general household consumption goods, which are supplied through imports. As such, the “dutch disease” effect induced by the weak linkages between village activities and household commodity consumption limits the potential of widespread economic gains from greater household income. Though village production increases due to the programs, it is not large enough to counterbalance the impact on price due to the increase in demand. It affects

especially households not participating in any of the programs, which will therefore need to pay higher prices for demanded goods without a corresponding increase in household income.

Therefore, village activities producing commodities demanded by local households should be supported in order to reduce local price increases, positively affecting overall village welfare.

Third, the support of village activities producing goods consumed by village households would need to be accompanied by strengthening food processing activities. Most of the unprocessed commodities consumed by households are already produced locally, especially through agricultural production for households' subsistence. However, processed goods are mostly imported, so non-farm small enterprises need to be introduced and fostered to create stronger linkages between local producers and consumers. For instance, processing local crop products, either for household consumption (e.g. beans or conserved vegetables) or for intermediate demand (e.g. maize) can potentially cover part of the domestic demand, thus inducing incentives for investment and unleashing higher intra-economy linkages.

Finally, market channels need to be created and supported to better connect producers and consumers in the village. The increase in the domestic demand for locally sold crop commodities across all simulations can be further increased if appropriate market channels are created. One such channel could be establishing period farmers' markets in the village, in which local producers can offer their goods for local consumers. Another possibility is to gear public food procurement for the local school towards the village, as commodities already produced by local farmers can cover most of the school food demand. As such, the public sector can directly engage in changing the local food system by demanding local food commodities, and therefore, substituting imported school food.

### 7.4 Study limitations

Regardless of the importance of the results produced and analyzed throughout this work, they surely need to be interpreted with caution. First of all, the use of static economy-wide models, like the STAGE model, enabled us to simulate short-run impacts produced by the concomitant implementation of rural development programs in the Rincão dos Maia village. However, it



does not allow any conclusions on the long run impacts produced on welfare, poverty and income inequality over a long period of time. Especially the absence of behavioral relationship in savings across the economy ignores the potential of today's savings for tomorrow's consumption, which have clear effects of future policy outcomes and are ignored in our results. Therefore, a dynamic economy-wide modelling, together with the consideration of adopting behavioral relationship on savings, should be applied in future research to fill this research gap.

Further study limitations reside in the design and assumptions made in this CGE model. Even though literature suggests that the choice of model closures and model elasticities does not affect substantially the direction of policy changes, they do influence the magnitude of impacts. Furthermore, this CGE model assumes perfect working markets, and not imperfect markets in which households make clear distinctions between tradables and non-tradables, as commonly found in rural areas of developing countries. Therefore, alternative model statements and assumptions can potentially earn different results.

Villages in Brazilian rural areas are highly heterogeneous in terms of income-generating activities, agricultural cropping methods, natural resource endowment, human capital, infrastructure, among others. As such, the villages may have completely diverse economic systems, and therefore transmit the impacts produced by policy changes throughout the village economies differently. Thus, the results on policy changes generated for the Rincão dos Maia village should be carefully used when applied to other rural village economies in Brazil. Therefore, future research should particularly focus to account for such differences among villages.

Lastly, the programs analyzed in this research only represent a relatively small portion of the public programs implemented in rural areas. In order to assess the full spectrum of policy alternatives and their potential impacts on rural economies, it is important to assess the impacts of the individual programs and the impacts of different combinations of programs of a greater spectrum of existing programs being implemented in Brazilian rural areas. Further research in the assessment of policy alternatives will allow policymakers to find better solutions over the full range of policy instruments at hand.