



# The impact of agricultural credit on the cattle inventory in Colombia: a spatial analysis

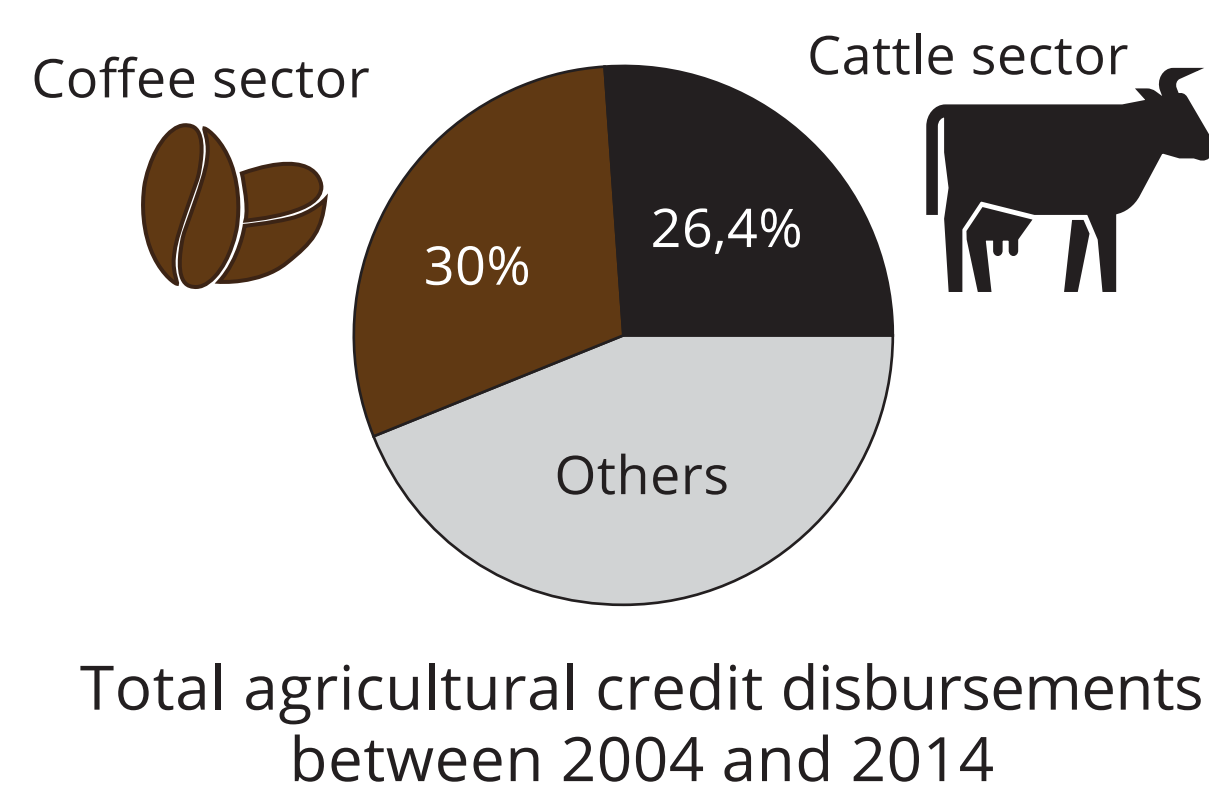
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## Introduction

- » There exists a positive relationship between credit and production but there are ambiguous effects of credit when it comes to poverty reduction or improvements in the quality of life of the rural population.
- » The access to rural credit or agricultural credit is specifically determined by income, perception of transaction costs, and the supply of credits granted within the territory, introducing the importance of the geographical location of financial institutions.



In Colombia, extensive cattle ranching is responsible for approximately 60% of the country's deforestation

## Objective

- » To describe the effect of agricultural credit on the behavior of the cattle herd at the departmental level in Colombia from 2011 to 2020. To assess potential spatial or spillover effects on credits distribution that has indirect effects on cattle herd.
- » To identify the possible effect of credit and the growth of the cattle herd on annual departmental deforestation rates from 2012 to 2019.

## Methodology

- » Data sources: a departmental data panel (33 departments) for the period 2011 to 2021 containing information on the access to credit, land use, and sociodemographic control variables.
- » We used models estimated by Ordinary Least Squares (OLS), panel data models (FE and RE) and spatial panel data models (SAR, SEM, and SARAR).

## Results and analysis

### Cattle Production

- » The credits granted to the cattle sector and the concentration of the cattle herds follow a similar behavior than the credits granted to the agricultural sector, meaning that there is a clear concentration in the central-Andean region of the country.
- » A lack of entities in place and the requirements imposed by the formal banking sector generate incentives for large producers and those living in cities and might leave smallholders behind (Figure 1).

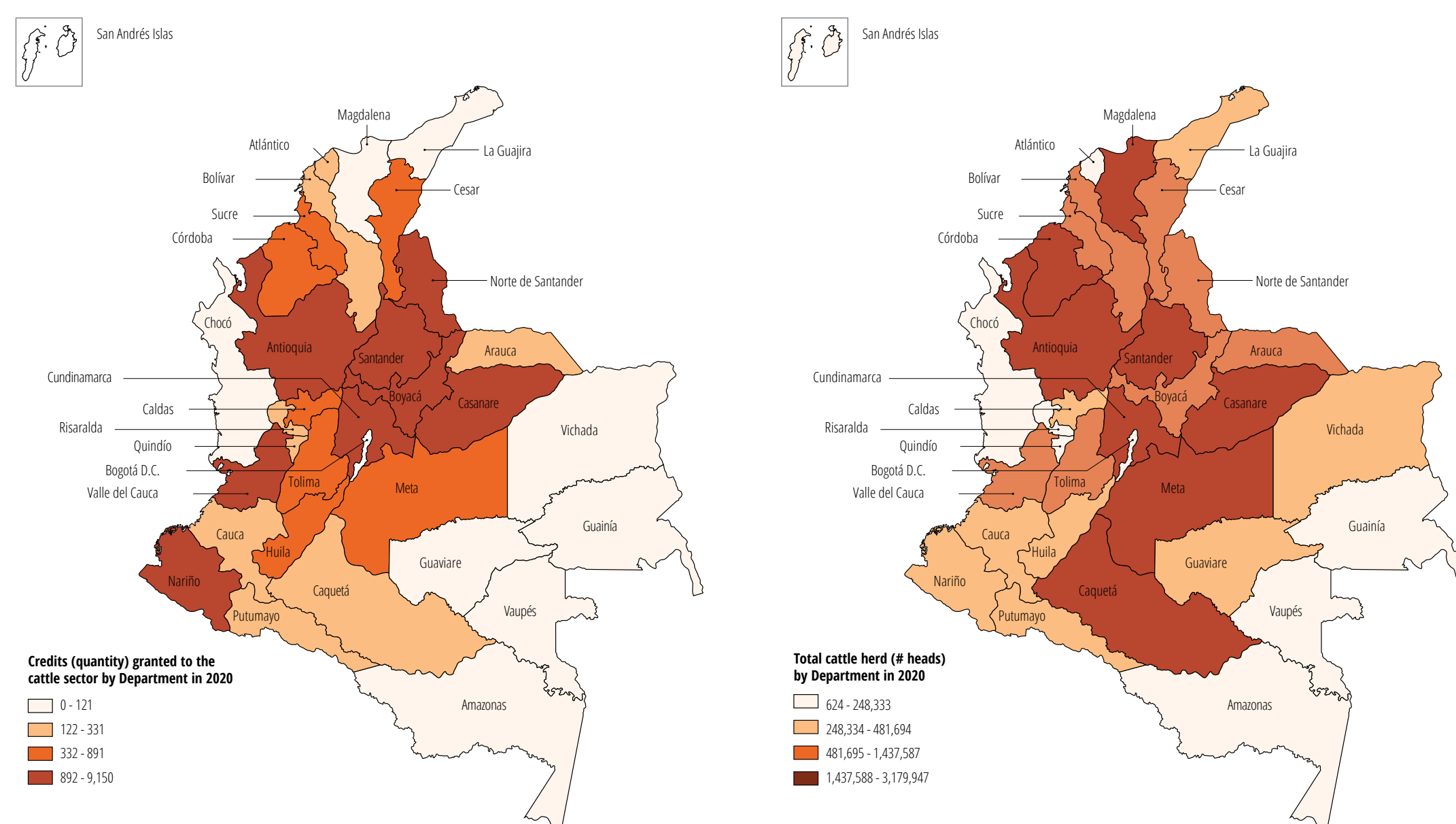


Figure 1. Number of credits granted to the cattle sector by department (left) and total cattle herd by department (right) in 2020. Source: own elaboration (2021).

- » The number of total credits has a positive relationship with cattle production while the total amount disbursed has a negative relationship. Contrary to this, credits for the cattle sector present a positive relationship if the credit amount is considered and a negative relationship if the total number of credits is considered.
- » The distribution of cattle production and credits are phenomena that respond to spatial correlations, that is, there are effects on these variables which depend on the place where the geographic units and their neighbors are located.

### Annual deforestation rate

- » Between the 2014-2015 and 2017-2018 periods, the loss of natural forest in the Departments of Vichada, Guaviare, and Caquetá increased considerably while it decreased in the Nariño and Cauca Departments. The dynamics within those Departments that increased their deforestation rates do not seem to correspond with the dynamics of the cattle sector, at a first sight, since the municipalities do not concentrate much cattle production (Figure 2).

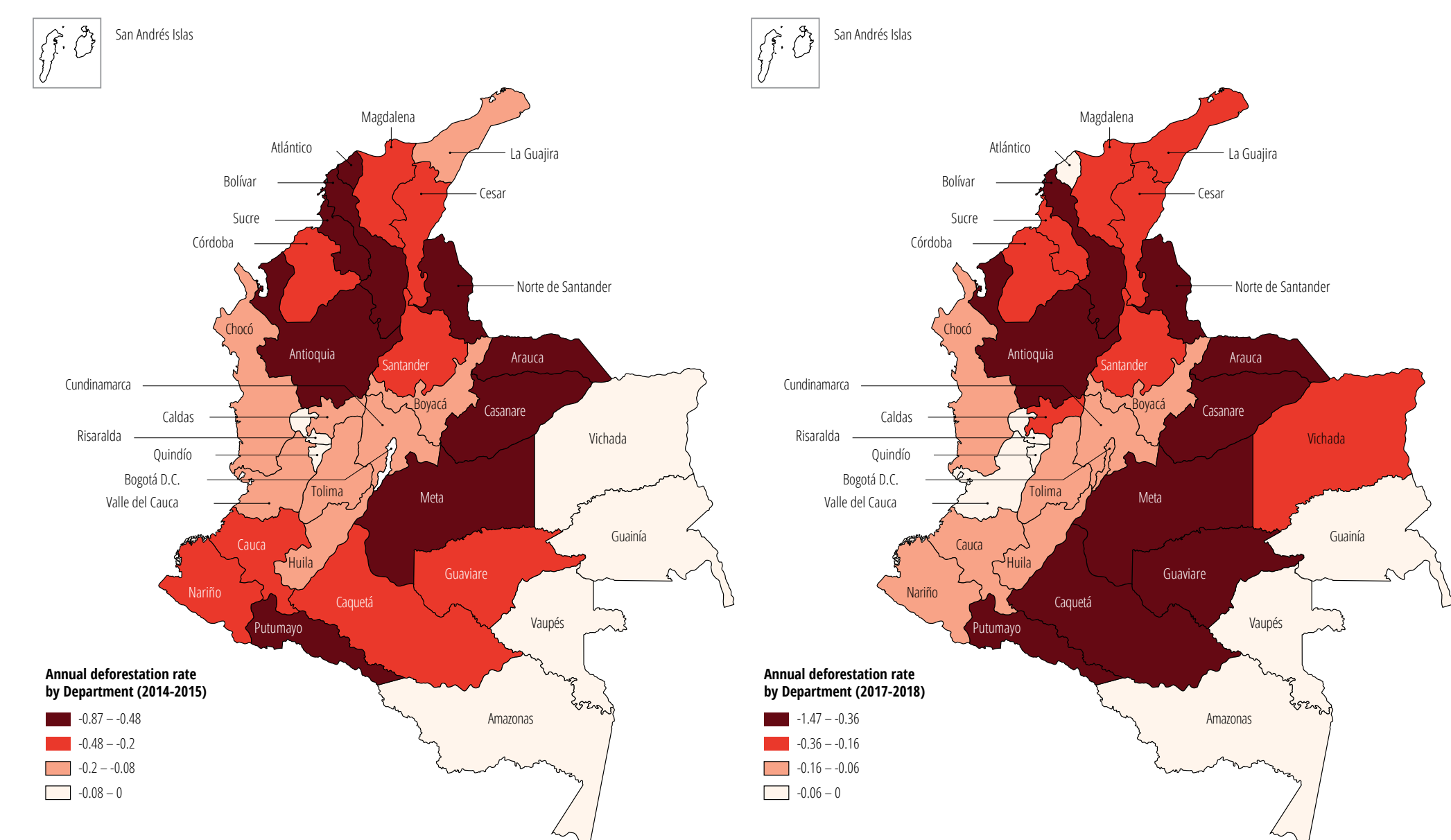


Figure 2. Development of the annual deforestation rates in Colombia for two periods: 2014 to 2015 and 2017 to 2018. Source: own elaboration

- » The variables total cattle herd, cattle land use, % rural population, and coca (hectares) influence the annual deforestation rates in the departments. Cattle herd, measured as the number of cattle in each department from year to year, and cattle land use, have an inverse and significant effect on the annual deforestation rates, meaning that when herd size and land use increase, deforestation rates also increase.

## Conclusions

- » When we spatially model cattle production, total credit values are significant, which shows that capital investment coincides in a contemporary way (in contrary to the case of coffee). This could show intrinsic differences between agricultural and cattle production, since in the former it takes time to observe the results while the latter may be more automatic.
- » We found a negative effect of cattle production on deforestation rates and that cattle farming is not the only cause for deforestation. We recommend including further differential factors associated with social, legal, and economic phenomena, such as the COVID-19 pandemic and the peace process, among others, in future analyses, to fully understand the drivers behind deforestation.

### Further reading

Mejía, D.; Díaz, M.F.; Enciso, K.; Burkart, S. (2021). What is the relationship between agricultural credit, cattle, and deforestation? A spatial analysis in Colombia. Policy Brief No. 61. Cali (Colombia): International Center for Tropical Agriculture (CIAT). 8 p. <https://hdl.handle.net/10568/116087>

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