The Mexican PROCAMPO Farmland Subsidy and Its Effectiveness as a Rural Anti-Poverty Program

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Abstract

This research examines the incidence (or capitalization) of the most important agricultural subsidy program in Mexico—Program of Direct Supports to the Farmland (PROCAMPO)—on farmland rental rates. Through the incidence, we explore the distribution of the PROCAMPO subsidy among tenants and their landlords, as well as whether this distribution differs across the tenant farmer income distribution. In our analysis, we use survey data collected by the Food and Agriculture Organization of the United Nations (FAO) in collaboration with Mexico's Ministry of Agriculture (SAGARPA) for the agricultural year 2008/2009, as well as data from INEGI (Instituto Nacional de Estadística, Geografía e Informática, Mexico's National Institute of Statistics). We employ a basic Ricardian theoretical model and use the standard hedonic approach to econometrically estimate the incidence of the PROCAMPO subsidy. To further assess the program's distributional effects, quantile regression analysis of the rental rate distribution is used to investigate the incidence across

the income distribution of tenant farmers. Our results suggest that the PROCAMPO subsidy is not passed through to landlord farmers, indicating that the program is successfully supporting the income of tenant farmers. This study makes three main contributions. First, to our knowledge we are the only authors thus far to study the incidence of PROCAMPO on farmland rental rates, as well as to explore the incidence of an agricultural subsidy in a developing country. Second, the dataset we employ has not been used before outside of the FAO. And third, we are the first to use quantile regression analysis to assess the distributional effects of farmland subsidies.[1]

1 Introduction

The Mexican government has long used its PROCAMPO farmland subsidy to small farmers as a way to ostensibly provide income support to relatively poor households.[2] Understanding the distribution of benefits and costs of such policies is necessary for determining policy effectiveness. Estimating the policies' incidence is the best method to measure these net benefits (Alston and James 2002). Further, Roberts et al. (2003) explain that the incidence of current/expected government payments on land rents is relevant because it provides information about the distribution of the payment benefits to landowners and tenants, and because the level of incidence may reflect the degree to which these government payments alter production.

Overall, it then is unclear whether the PROCAMPO land subsidy program has the desired results because landowners may simply raise the rents to offset the subsidy—i.e., the subsidy will be capitalized into land rents. Indeed, some research from developed countries suggest

[1]This work incorporates very valuable feedback I received from many colleagues, directly or indirectly through the conferences I have attended, I apologize if I accidentally omit someone: Allen Klaiber, Ian Sheldon, Nathaniel Hendricks, Joyce Chen, Leah Bevis, Marc Bellemare, Bo Feng, Leonardo Perez (FAO), Juan Francisco Islas (FAO), Regional Science Association International 10th Annual Midwest Graduate Student Summit, 2017 John Glenn Colloquium at The Ohio State University, 2015 North American Meetings of the Regional Science Association International, and attendees at The Ohio State University seminar.

[2]Originally, PROCAMPO was scheduled to be terminated in 2008. However, instead it went through continuous transformations of names and scope. As of 2017, the current version of PROCAMPO is now called "PROAGRO Productivo."

that the incidence of farmland subsidies on rents, specifically of direct payments tied to land, is close to 100 percent (Floyd 1965, Gardner 1987, Kuchler and Tegene 1993, Barnard et al. 1997, Alston and James 2002, Roberts et al. 2003, Alston 2007). If that is the case for Mexico, PROCAMPO could be subsidizing relatively wealthy landowners rather than the intended tenant beneficiaries, which would have implications for both PROCAMPO and similar "redistributive" land subsidy programs around the developing world.

In this research, we estimate the incidence (or capitalization) of PROCAMPO on farmland rental rates. The results will help answer two questions: What is the distribution of PROCAMPO subsidy among tenants and their landlords? And, how does this distribution differ across the tenant farmer income distribution? The less the PROCAMPO subsidies are capitalized into land rents, the more that the stated policy goals of helping poor farmers are being met—i.e., zero capitalization implies complete capture of the subsidy by the relatively poor-tenant farmer households and 100% capitalization implies complete pass-through of the subsidy to the relatively-rich landowner households.[3] To the extent that there is positive rent capitalization, it would increasingly suggest that efforts to help the poor would be more effectively delivered through direct payments to the household that are decoupled from farm size (which of course would have their own unintended consequences).

In our analysis, we use data from a survey collected by the Food and Agriculture Organization of the United Nations (FAO) in collaboration with Mexico's Ministry of Agriculture (SAGARPA) for the agricultural year 2008/2009.[4] We believe we are the first to use these data to examine any effect of PROCAMPO. We employ a basic Ricardian-rent theoreti-

[3]Throughout the paper, we assume that tenant farmers have lower income than landowners. The scarce literature in the topic for Mexico validates this hypothesis. For instance, Torres Lagarda, Ochoa Vega, Gonzalez Velazquez and Fonseca Ramirez (2000) note that rental lands are concentrated in plots bigger than 5 hectares, which usually belong to wealthier farmers. These type of plots represent 68% of the borrowed land in the states of Jalisco, Chihuahua and Durango. Sharecropping in those plots bigger than 5 hectares represent 79% of the land surface in Chihuahua, Durango and Zacatecas. Moreover, landlords decide to rent their land because this ensure them a stable income as well, as they can work in other activities including off-farm. The tenant farmers, on the other hand, decide to rent because land prices are high and buying land has an implied risk for these farmers because of the high variability in the land prices, asymmetry of information, and speculation (SNSP-Oleaginosas 2009).

[4]SAGARAPA stands for Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación.

cal model (Ricardo 1821, Palmquist 1989) and the standard hedonic approach developed by Rosen (1974) to econometrically estimate the incidence of the PROCAMPO subsidy on farmland rental rates. To further appraise the program's distributional effects, quantile regression analysis is used to investigate the incidence across the income distribution of tenant farmers.

Our pooled OLS results indicate that PROCAMPO subsidies remain with the tenant farmers. This result also holds when we consider all income quantiles separately. Although the PROCAMPO subsidy is not a significant predictor of the rental rate, a number of other variables, including access to credit, share of production in white corn and beans, and soil quality impact the rental rate across the rental rate distribution of tenant farmers, as expected.

Economic theory suggests that government payments tied to the area of farmed land should increase rents on those lands (Floyd 1965, Gardner 1992, Kuchler and Tegene 1993, Barnard et al. 1997, Roberts et al. 2003). Following this reasoning, fully decoupled payments (i.e., lump-sum payments to fixed land units that are not tied to current production) should not cause farmers to alter their production decisions, so the payment should be fully capitalized in land rent (Roberts et al. 2003, Alston 2007). As noted by Kirwan (2009), most previous literature on the topic typically assumes full incidence on land rent (e.g., Traill 1982, Featherstone and Baker 1988, Herriges, Barickman, and Shogren 1992, Goodwin and Ortalo-Magné 1992, Weersink et al. 1999, Lamb and Henderson 2000). Nonetheless, market imperfections and wealth effects can cause these decoupled payments to induce a production response, potentially causing lower commodity prices and higher input prices, and offsetting the level of incidence, much like coupled payments (Hennessy 1998, Adams et al. 2001, Roberts et al. 2003).

Empirical evidence has found that the estimated magnitude of farm payment incidence on land rents varies considerably, running from about 20% incidence to 100% incidence. One of the reasons for this variation is the broad set of different concepts and measures behind the

construction of the included variables in the literature, and each one has different implications (Alston 2007). In addition, most existing literature focuses on developed country settings (U.S., Canada or Europe) with well-functioning land markets.

In the U.S. context, recent studies include those by Hendricks and Pokharel (2016), Kirwan and Roberts (2016), Kirwan (2009), and Roberts et al. (2003). Recent studies examining the European context include those by Ciaian, d'Artis, and Espinosa (2017), Klaiber, Salhofer, and Thompson (2017), Michalek et al. (2014), Gocht, Britz, Ciaian, and Gomez y Paloma (2013), Moro et al. (2013), O'Neill and Hanrahan (2013), Kilian et al. (2012), Breustedt and Habermann (2011). The latter paper (Kilian et al. 2012), which investigates the impacts of the Fischler Reform of the Common Agricultural Policy on land rental prices and the capitalization of single farm payments (SFP) into land values is particularly relevant for the present research. Kilian et al. (2012) estimate a similar econometric model to the one we employ, and the payment program they examine (1st pillar payments) are direct payments similar to PROCAMPO. Kilian et al. (2012) found that one additional Euro of direct payments of the SFP 1st pillar increases rental prices by 28–78 cents, depending on the kind of payment and whether the land in question is crop land or an agricultural area in general. Other papers have explored the effect of decoupled payments in the distribution of farm income in developed countries. For instance, Gocht,Britz, Ciaian, and Gomez y Paloma (2013) find that a uniform per-hectare payment at the EU level has no effect on the landowners' rental income, supporting the results of this paper. In contrast, Ciaian, d'Artis, and Espinosa (2017) find that on average in the EU, the non-farming landowners' policy gains are between 18% and 27% of the total decoupled payments, therefore evidence is mixed in this context as well. The differences between these papers stem mainly from the differences in data sources, and the resulting differences in econometric methodology, as well as the chosen identification strategies.

The relatively low incidence of PROCAMPO we find compared to some higher incidences found across the literature might have various explanations. For instance, there are many

differences between the U.S. (and other developed countries) and Mexico, e.g. the average size of the farmland in the U.S. is 98 hectares as opposed to Mexico's 8 hectares—which might affect how much of the subsidy can be passed on. Other reasons include informal leasing among families in sharecropping and other arrangements which cannot be distinguished in the dataset and it is very likely that the reported rent per hectare only applies to the land that is formally rented, not for those other arrangements. Yet, the overall conclusion of our work is that PROCAMPO is mainly reaching its goal of benefiting the poor farmers and it is not an unintended subsidy program for relatively wealthy landowners.

This study makes three main contributions. First, to our knowledge we are the only authors thus far to study the incidence of PROCAMPO on farmland rental rates, as well as to explore the incidence of an agricultural subsidy in a developing country setting. Second, the dataset we employ has not been used before outside of the FAO. And third, we are the first to use quantile regression analysis to assess the distributional effects of farmland subsidies.

The paper proceeds as follows. Section 2 describes PROCAMPO's institutional characteristics and eligibility criteria. Section 3 lays out the theoretical model. Section 4 describes the data employed and the empirical strategy. Section 5 presents the base results and robustness checks, followed by the conclusions in Section 6.

2 Institutional Context

PROCAMPO is a government program that was created by decree in July 1994 to compensate farmers and promote their competitiveness after Mexico joined the North American Free Trade Agreement (NAFTA) with the U.S. and Canada. Farmers were concerned about the potential negative consequences of NAFTA for their operations (IADB 2010). PROCAMPO is Mexico's most important agricultural program in history and this can be reflected in its share of the government budget. For example, from 1994 to 2010 an average of 32% of bud-

get of the Mexican Department of Agriculture (SAGARPA) was devoted to PROCAMPO (ARAPAU y Asociados and SAGARPA 2011). In 2008, the year of data collection, the annual government expenditure on PROCAMPO was 14,198.5 million pesos or 1.27 billion U.S. dollars, 2.4 million producers were supported to plant 12 million hectares (ASERCA and SAGARPA 2009).[5]

In 2008 (the period we study), the Mexican government defined eligible farmers as physical and legal persons who had land already registered in PROCAMPO, had completed an application, and were in compliance with the program's operation, and whose registered property was in operation (DOF 2002). To be eligible for the PROCAMPO subsidy, the producer was required to own, have rights to, or rent that land, and must grow any legal crop in any of the two agricultural cycles, Spring-Summer (Primavera-Verano, PV) or Autumn-Winter (Otoño-Invierno, OI). In this year, the upper limits on land-size to be eligible to receive PROCAMPO were 100 hectares of irrigation land and 200 hectares of rain-fed land. The upper limits for corporations or professional partnerships were 2,500 hectares of irrigation land and 5,000 hectares of rain-fed land. It is important to highlight that in areas of medium to low productive potential, there exists informal sharecropping leasing arrangements that can influence our results because the dataset does not distinguish rental rates paid for these other types of arrangements. Yet, it is likely that the rental rate reported by the farmers include only that rate paid for formally rented land, not for sharecropping or borrowed land given the framing of the survey's question. [6]

Since 2001, the PROCAMPO subsidy classified producers according to three strata with the purpose of supporting the more vulnerable farmers by providing them a higher subsidy per hectare (usually on the order of 10 dollars more per hectare for strata I and II):

[5]Currency conversions assume an exchange rate of 11.14 pesos per dollar, which is the average of the daily exchange rates throughout 2008.

[6]Informal sharecropping leasing agreements can include cases in which the tenant farmer pays his rental rate in any other form that does not include money, such as giving a percentage of the production to the landlord farmer or giving a percentage of the government subsidies they receive for their land (such as PROCAMPO). Given that information about these types of arrangements were not available in the dataset employed in this study, it is possible that our results underestimate the incidence.

I. Producers with 1 eligible hectare or less (PV cycle only). Lands with less than 1 hectare were considered as 1 hectare for payment purposes. PROCAMPO payments were given before planting for this stratum.

II. Producers with more than 1 and less than 5 eligible hectares.[7] PROCAMPO payments were given before planting for this stratum.

III. Those producers classified in neither I nor II, those with Autumn-Winter (OI) cycle lands, and new beneficiaries. PROCAMPO payments were given after planting for this stratum.

A number of drawbacks of the PROCAMPO program have been identified in previous studies and analysis. CONEVAL, the National Council for the Evaluation of Development Policies in Mexico, performed an evaluation of PROCAMPO in 2013 (CONEVAL 2013). This evaluation consisted of a comparison of the stated goals of the program with the performance indicators that PROCAMPO has been publishing (as required by law) throughout its years of operation. CONEVAL (2013) concluded that the program was not meeting its original goals, therefore they recommended exclusively targeting low-income rural producers. Nonetheless, this evaluation also highlighted that the indicators that the government uses to evaluate this program do not reflect the reality of the operation of each component of the program and there is no match between them and the goal and purpose of the program. Thus, while CONEVAL (2013) criticizes the indicators, but employs them to conclude that the program is not meeting its original goals. This approach not only raises questions about the validity of their conclusions but also signals the critical need of independent evaluations of government

[7]This stratum also allowed a higher upper limit of eligible hectares for those producers with eligible land devoted to contract farming and/or productive reconversion on 11 northern and northwestern states (PV cycle only): Aguascalientes (6), Baja California Norte (18), Baja California Sur (15), Colima (7), Chihuahua (10), Durango (8), Jalisco (6), Sinaloa (10), Sonora (7), Tamaulipas (10), and Zacatecas (8).The program of productive reconversion incentivized farmers to grow more productive crops than the ones they were growing at that time. These 11 states have larger farms, in terms of area and operations, on average—e.g., a Baja California farm can be 30 times bigger than a farm in the Estado de México (ARAPAU y Asociados and SAGARPA 2011). Thus, PROCAMPO's legislation likely exacerbated these disparities by giving preferential treatment to states already in a favored position.

programs, such as the present study.

Another drawback of PROCAMPO relates to its initial creation of a directory of eligible lands and the fact that those producers enrolled in the directory as of 1995-1996 were given definitive rights to the program's benefits as long as it remained in force (DOF 1994). The directory required that farmers had to have grown any of the nine eligible crops —cotton, rice, safflower, barley, beans, corn, sorghum, soy and wheat— in any agricultural cycle prior to August 1993. Nevertheless, as of 1995, the law was modified to allow any legal crop to be eligible, but the law still required the farmers to have grown any of the nine eligible crops prior to 1993, therefore, this change only allowed the current farmers in the directory to get PROCAMPO for any crop they grew and made the inclusion of new beneficiaries basically impossible. As a result, many small farmers are not receiving PROCAMPO because they were initially ineligible.[8] As ARAPAU y Asociados and SAGARPA (2011) stated, even if PROCAMPO was designed to eliminate price and production distortions, it does create an internal-competitiveness distortion because some receive PROCAMPO, while other similar farmers do not. Consequently, by 2009, a total of approximately 13.5 million hectares in Mexico received PROCAMPO, amounting to 62% of Mexico's planted land area (ARAPAU y Asociados and SAGARPA 2011).

Goldstein, Erickson, Gephart, and Stevenson (2011) state that PROCAMPO has also done a poor job in reaching farmers with less than 5 hectares, because they are getting less money than farmers with more hectares. One of the reasons is that PROCAMPO pays farmers based on growing seasons, hence it often makes double payments to farms that are able to plant twice a year, something farmers with small lands cannot do. Overall, in our period of interest, the 9th and 10th producer deciles received about 57% of PROCAMPO's transfers whereas the 1st to 5th producer deciles only obtained around 17% of those transfers (Fox and Haight 2010), and this inequality is also observed for the geographical concentration of PROCAMPO recipients. These factors motivate our use of both regional fixed effects and

[8]Pending administrative and judicial proceedings over their land might also prevent some farmers from obtaining the PROCAMPO subsidy (SAGARPA 2014).

quantile regressions of the rental rate distribution to measure the distributional incidence of PROCAMPO.

A third drawback relates to two changes to PROCAMPO that reduce the program's compliance. In 2001, changes were made that allowed the farmers classified in stratum I and II to receive their PROCAMPO subsidies before planting, which means that there is no verification that the land was actually planted or program rules are followed. In addition, the number of personnel employed by SAGARPA that is tasked with managing the program has greatly declined over time (ARAPAU y Asociados and SAGARPA 2011). A clear concern is the possibility that many of the farms receiving the subsidy no longer comply with the program's criteria.

A fourth drawback is that there are no productive requirements, which means that some farmers just cultivate their land to get the PROCAMPO subsidy without intending to harvest any product. This is such a common practice in rain-fed land with low productive potential that these lands have come to be known as "siembras procamperas," or "procamping planting land" (ARAPAU y Asociados and SAGARPA 2011).

In addition to these government evaluations, a considerable academic literature exists that looks at various aspects of PROCAMPO, but none asks (or answers) the question that we pose. Herrera-Ramos (2002) presents a brief descriptive analysis of the effect of PROCAMPO on poverty in Mexico and suggests that decoupled payments can have perverse effects in terms of the income distribution due to the institutional design of those payments. In particular, Herrera-Ramos (2002) notes that the National Survey of Income and Expenses of the Households of 1994 (ENIGH 1994) shows that 227,000 households received PROCAMPO but 70% of them were located in urban localities, 42.54% were in metropolitan localities and 26.61% were in localities with 100,000 inhabitants or more. Moreover, PROCAMPO comprised 7% of the quarterly income of those households. After 1994, PROCAMPO's institutional settings were modified so as to focus on the rural households, and the same survey in 1998 shows that most PROCAMPO subsidies were received by households in

localities with fewer than 15,000 inhabitants. Maybe because it focused more on rural households, by 1998, PROCAMPO represented 33.43% of total quarterly income of the recipient households. Herrera-Ramos (2002) show that poverty has decreased among the households benefited by PROCAMPO but income inequality has increased. They further claim that PROCAMPO generates an increase in income inequality by 6 points (using the Gini index) which would not have occurred if PROCAMPO did not exist. The impacts of PROCAMPO on poverty, crop prices, and production has also been explored by Skaggs et al. (2011), Goldstein et al. (2011), Tangerman (2006), Sadoulet, De Janvry, and Davis (2001), and Cord and Wodon (2001).

Finally, it is important to take into account the characteristics of the land rental market in Mexico as we interpret our results. The farmland market is only 1% of the size of the urban land market (Sandoval 2009). Sandoval (2009) finds that the farmland market faces legal, social, and economic restrictions. Among the legal restrictions are delays in the Registro Público de la Propiedad (Public Property Registry), meaning land property issues and land boundary disputes can take up to five years to resolve. In addition, in many areas, land has been subdivided many times, meaning that farms are typically below the necessary scale to reach competitive productive levels (OECD 2015).

3 Theoretical Model

A simple Ricardian rent model shows that the ultimate incidence of agricultural subsidies tied to land should be on landowners given that the supply of land is essentially fixed (Alston 2007). Figure 1 graphically shows why, given a direct transfer per hectare of land, such as the PROCAMPO subsidy, and an inelastic supply of land, a perfectly competitive market should reflect 100% of this subsidy onto an increase in the average rent per hectare. Our research tests this theory in a developing country setting, where market imperfections are considerably more likely.

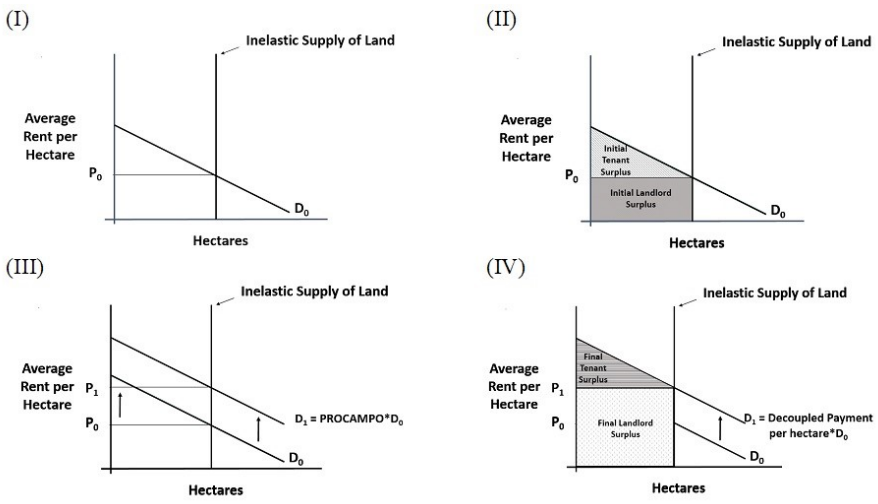

Figure 1: Ricardian Model illustrating the effect of a farm subsidy on farmland rental rates

However, even in a perfectly competitive market, both Floyd (1965) and Alston and James (2002) demonstrate that the situation described above is true only under very specific assumptions where either the price of non-land inputs is fixed, or the factor proportions are fixed. In any other scenario, the total benefit to factors will be shared between land and other inputs, and the rules determining eligibility for the subsidies will be an important determinant of this share. Moreover, Skoufias (1995) stated that costs associated with transactions in factor services, such as labor, lead to market imperfections or the absence of trade in the land rental market. Therefore, we expect that our results will reflect the equilibrium of an imperfect land rental market.

4 Empirical Strategy

4.1 Data

This study uses data collected in a survey executed by the Food and Agriculture Organization of the United Nations (FAO) and Mexico's Ministry of Agriculture (SAGARPA) for the 2008

agricultural year (FAO and SAGARPA 2014). [9] The sampling frame for this survey is the population listed in the records and registers of all the government programs that have served or are serving the rural sector in Mexico, and the final sample, representative of all rural Mexican farms, was determined by a stratified sampling method by income strata. In order to answer the research question, the 935 farmers that rented any percentage of their productive land from another farmer/landowner were included in the estimation of the econometric model.

Table 1 presents descriptive statistics for the farmers in the sample. On average, farmers received 319.8 pesos (28.7 dollars) per hectare of PROCAMPO subsidy, while their rent averaged 1,769.9 pesos (158.9 dollars) per hectare in the 2008 agricultural year. Tenant farmers crop an average of 13.7 hectares and they rent 75.5% of the land they operate. It is also notable that the amount of other subsidies per hectare they receive from the government is 2.8 times the amount they get from PROCAMPO (including subsidies from the Ministry of Agriculture, Ministry of Social Development and other government agencies).

The credit access variable is a dummy with a value of 1 if the farmer indicated in the survey that he had access to any sort of credit, and for the sample in this research, 20% of farmers have access to credit. The income strata variables are used to explore heterogeneity in terms of income; we use the income strata information provided by FAO and SAGARPA (2012) which classified farmers into different income strata depending on their income from average sales in 2008. These strata are described in Table 2.[10]

The soil quality variables are constructed using the Edaphologic Vectorial Data available at INEGI (Instituto Nacional de Estadística, Geografía e Informática—i.e., Mexico's National Statistics Institute), and were matched to each farmer's municipality using ArcGIS. The soils were then ranked based on their natural qualities for agricultural production and soil

[9] One of this study's authors took part in both survey development and data collection activities while employed by FAO in 2010.

[10] The estimation in this study only considers Stratum 1 to 5. Only three observations fell into Stratum 6, and the values of the variables within these observations were largely inconsistent with the other strata. We believe the inconsistencies in these observations are likely due to data-collection errors and we have not included these observations in our analysis.

Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	N
Average rent per hectare (pesos)	1,769.9	1,837.0	100.0	12,000.0	935
PROCAMPO per hectare (pesos)	319.8	418.9	0.0	2,000.0	935
Income Stratum 1 (Family subsistence without linkage to the market)	0.10	0.31	0.00	1.00	935
Income Stratum 2 (Family subsistence with linkage to the market)	0.37	0.48	0.00	1.00	935
Income Stratum 3 (In transition)	0.09	0.29	0.00	1.00	935
Income Stratum 4 (Entrepreneurial with fragile profitability)	0.15	0.36	0.00	1.00	935
Income Stratum 5 (Thriving entrepreneurial)	0.28	0.45	0.00	1.00	935
Total crop area (Ha)	13.7	19.8	0.0	228.0	935
% Rented land	75.5	27.9	5.3	100.0	935
Amount of other subsidies per Ha (pesos)	916.1	2,094.7	0.0	16,514.3	935
Dummy for credit access	0.20	0.40	0.00	1.00	935
High quality soil Dummy	0.17	0.37	0.00	1.00	588
Medium quality soil Dummy	0.31	0.46	0.00	1.00	588
Low quality soil Dummy	0.14	0.35	0.00	1.00	588
Worst quality soil Dummy	0.38	0.49	0.00	1.00	588
Yellow Corn (grain) (Highest Share in Value of Production)	7.39	25.38	0.00	100.00	908
White Corn (grain) (Highest Share in Value of Production)	45.88	47.43	0.00	100.00	908
Sorghum (grain) (Highest Share in Value of Production)	10.08	28.59	0.00	100.00	908
Beans (Highest Share in Value of Production)	5.31	20.24	0.00	100.00	908
Other crops (Highest Share in Value of Production)	6.20	22.73	0.00	100.00	908
Number of hectares surpasses PROCAMPOś limit for rain-fed land	0.01	0.08	0.00	1.00	935
PROCAMPOś take up by State (%)	4.26	2.33	0.35	13.79	935
Farm grows vegetables	0.04	0.20	0.00	1.00	935
South Region Dummy	0.23	0.42	0.00	1.00	935
Center Region Dummy	0.27	0.44	0.00	1.00	935
East Region Dummy	0.12	0.33	0.00	1.00	935
West Region Dummy	0.15	0.36	0.00	1.00	935
North Region Dummy	0.23	0.42	0.00	1.00	935

Table 2: Income Strata

Stratum	Description	Income from sales in 2008
1	Family subsistence without linkage to markets	<$1,543
2	Family subsistence with linkage to markets	$1,543-$6,630
3	In transition	$6,630-$13,628
4	Entrepreneurial with fragile profitability	$13,628-$50,442
5	Thriving entrepreneurial	$50,442-$1,049,327
6	Dynamically entrepreneurial	>$1,049,327

fertility (INEGI 1999).[11] In the sample, 20% of farms have high quality soil, 30% have medium quality, 10% have low quality and 40% have the worst quality. Also, the crops with the highest share in the value of production are yellow corn, white corn, sorghum and beans. On average, none of these farms have a land surface that surpasses PROCAMPOś limit for rain-fed land. The percentage of farmers receiving PROCAMPO in each state is 4.3% on average, with a maximum of 13.8%. A very small percentage of farms grow vegetable crops. Also, Table 3 shows that the farms in the sample perform various economic activities besides agriculture, but their main activity is agriculture, followed by livestock, and forestry. Finally, Figure 2 shows the states corresponding to each region.[12]

Table 3: Economic Activities of the Farms

Activities	% of Other Activities Performed by the Farms
Forestry	9.30%
Livestock	35.51%
Grocery	0.96%
Aquaculture	0.21%
Bakery	0.11%
Fishing	0.32%
Tortilla Production	0.43%
Transformation of Primary Products	1.28%
Other Activities	2.46%

Note: Agriculture is the main activity of all the farms analyzed in this paper. Nonetheless, they also perform other secondary activities. This table shows what percentage of farmers stated that they perform those other activities besides agriculture.

[11] Details about the construction of these variables and which specific soil types that were used for each level of quality can be provided by the authors on request.

[12] Specifically, the North region dummy comprises the states of Baja California Norte, Baja California Sur, Coahuila, Chihuahua, Durango, Nuevo Leon, Sinaloa, Sonora, and Tamaulipas. The South region dummy comprises the states of Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, and Yucatan. The Center region dummy comprises the states of Aguascalientes, Guanajuato, Michoacan, Morelos, Estado de Mexico, Queretaro, San Luis Potosi and Zacatecas. The East region dummy comprises the states of Hidalgo, Puebla, Tlaxcala and Veracruz. And the West region dummy comprises the states of Colima, Jalisco and Nayarit. Mexico City (called Distrito Federal a year ago) is not included in the FAO-SAGARPA survey, mainly because the rural activities taking place there are minimal.

Note: Mexico City (called Distrito Federal a year ago) is not included in the FAO-SAGARPA survey, mainly because the rural activities taking place there are minimal.

Figure 2: States included in each Regional Fixed Effect

4.2 Econometric Model

The econometric model employed is the hedonic pricing approach (Rosen 1974). The price of land (land rents) is assumed to be explained by a set of relevant characteristics, whereas the estimated coefficients reflect the capitalization of those characteristics into land rents.[13] We first estimate a simple OLS model. In addition, because we are interested in the incidence of PROCAMPO across the income distribution of tenant farmers, we use the quantile regression method (Koenker and Bassett 1978). The quantile regressions allow us to identify the differential effects from PROCAMPO on farmers with different quantiles of the rental rate distribution. As the average rent per hectare has a similar distribution to the income of

[13]Feichtinger and Salhofer (2011) state that most studies analyzing the determinants of land prices either refer to the net present value (NPV) method or the hedonic pricing approach as a basis of their work. They also remark that if the explanatory variables included in the hedonic regression include returns from land (or some proxy) and government payments, then the hedonic approach and the empirical implementation of the NPV model converge to the same empirical model, although based on different theoretical settings.

farmers, the quantile regressions will allow us to indirectly infer the effect of PROCAMPO on the income distribution of farmers.

Figure 3 shows our motivation for the use of the quantile regression based on the ranking of the average rent per hectare; from it we see that the average rent per hectare can be matched to the income strata of the farmers. In other words, the higher the stratum to which the farmer belongs, the higher the average rent per hectare he pays. Another essential characteristic for quantile regression is that the dependent variable must have a smooth distribution across quantiles. Figure 4 shows that this is indeed the case for our dependent variable.

In sum, we first estimate the capitalization using standard OLS estimation of the log-linear model:

$$ln(r_i) = \alpha + g_i\gamma + X_i'\beta + Region_j'\delta + \epsilon_i, \tag{4.1}$$

where $ln(r_i)$ is the log average rent per hectare reported by farm i, g_i is the amount of PROCAMPO subsidy per hectare for the 2008 agricultural year for farm i, X_i is a vector of farm-level covariates, and $Region_j$ is a vector of regional fixed effects. The variable of interest, the incidence of PROCAMPO, is denoted by γ. Similarly, the quantile regression to be estimated is given by:

$$Q_\theta(ln(r_i)|X_i) = \alpha_\theta + g_i\gamma_\theta + X_i'\beta_\theta + Region_j'\delta_\theta + \epsilon_i, \tag{4.2}$$

where the subscript θ denotes the quantile.

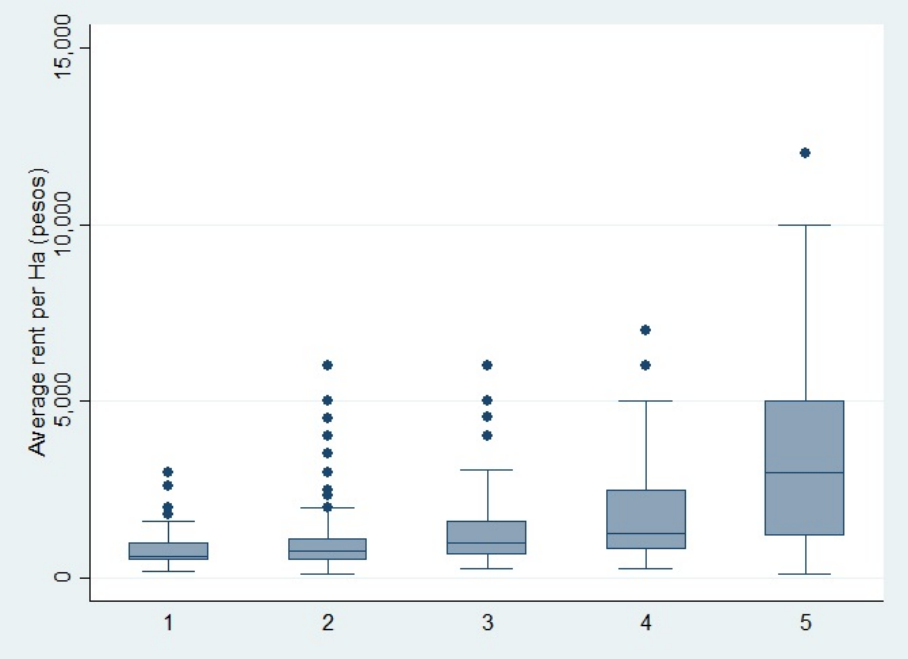

Figure 3: Behavior of Average Rent per Hectare by Income Strata

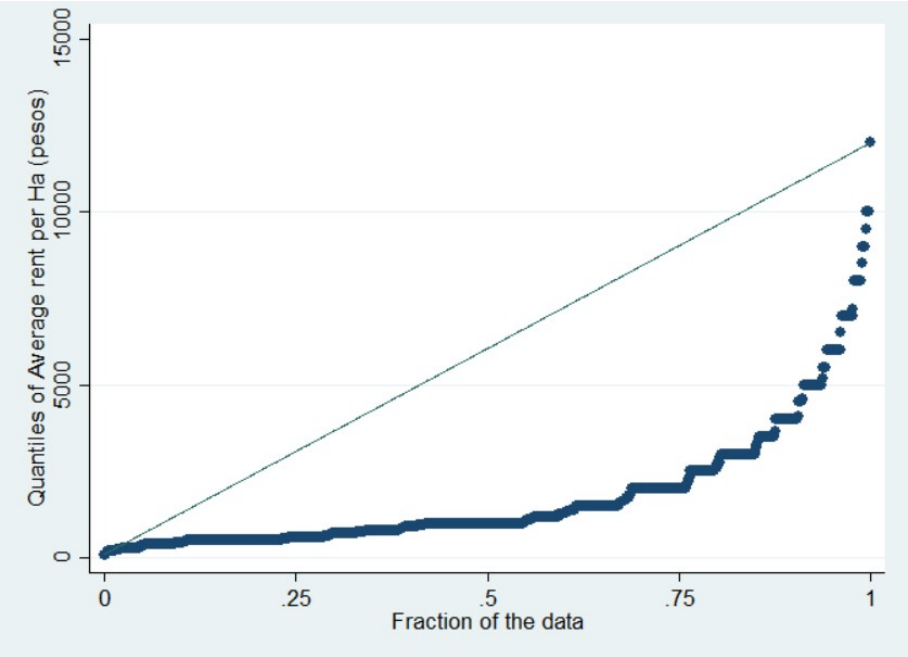

Figure 4: Quantile Distribution of the Average Rent per Hectare

5 Results

Table 4 shows the results of the estimation for the OLS regression and for each quantile.[14] In both the OLS regression and the quantile regressions, the coefficient is neither economically or statistically significant. This result suggests that at all levels of the rental rate distribution, the PROCAMPO subsidy is not passed through from tenant farmers to landowners.

The OLS estimation shows that the income stratum to which the tenant farmers belong significantly affects the average rent per hectare they pay, this significance further supports the use of quantile regressions to understand the effect of PROCAMPO on the average rent per hectare across the rental rate distribution. Our main specification includes regional fixed effects. The regional fixed effects are both statistically and economically significant and suggest that unobserved factors that vary by region, such as the political or socioeconomic conditions, are more important than PROCAMPO in explaining the average rent per hectare for tenant farmers.

The variables that are consistently significant across all specifications are access to credit (having access to credit is associated with paying about 50 centavos more in average rent per hectare, though this could be an unmeasured effect of the quality of factors of production such as labor or capital, e.g. tractors or buildings),[15] high or medium-quality soil, the share of white corn in the value of production, and the share of beans in the value of production. Whether the farmś number of hectares surpasses PROCAMPOś limit for rain-fed land is significant only for the OLS specification and for the 25^{th} quantile. Growing a vegetable crop is positive and significant for the 75^{th} and 90^{th} quantiles. For the 90^{th} quantile, the low-quality soil variable was negative and significant. Finally, PROCAMPO take-up rate by state is positive and significant only for the 90^{th} quantile.

[14] Please refer to Appendix A for regression results with all regional fixed effects and for alternative specifications).

[15] Given that our model does not distinguish between qualities of land beyond the soil quality variables, the access to credit variable might be capturing part of these factors. That is, in order to access to credit, the farmer needs to provide guarantees that ensure the bank that the loan will be repaid. It is more likely that farmers with better productive land can provide sufficient guarantees for this purpose.

The implication of our main finding is that PROCAMPO is generally meeting its goal of helping lower-income farmers and farmers in general—with very little passing through as higher rents. Our finding of very low to no incidence of PROCAMPO is not consistent with the much of the literature, which finds incidences of at least 20%, with most estimates being considerably higher (Kirwan 2009, Kilian et al. 2012, O'Neill and Hanrahan 2013, Kirwan and Roberts 2016). The mechanism behind our findings is related to the fact that in a partial equilibrium model, such as our Ricardian model, the burden of the tax (in this case, the subsidy) depends on the elasticity of supply relative to the elasticity of demand, which make them ideal to study cases with imperfect competition (Fullerton and Metcalf 2002). In particular, with farms so small and below efficient scale, it may be harder for landowners to find alternative renters in the open market because larger farms, for instance, would have little value in renting isolated small plots. Another factor affecting the elasticities of demand and supply of land in our model is that the informal (and thin) nature of Mexican farmland markets may reduce price responses, with changes coming on other margins (Hendricks and Pokharel 2016; Li and Tsoodle 2017; Schlegel and Tsoodle 2011). This pattern suggests that prices do not always reflect the competitive rate (Perry and Robison 2001; Tsoodle, Golden and Featherstone 2006). Likewise, lands described as "siembras procamperas" may be associated with these insignificant estimates because farmers might not be maximizing their productivity—i.e., the value of the land remains unchanged by the subsidy, though presumably this is offset by what other potential renters may do. Finally, to the extent that land leases are long-term, this would reduce the short-term incidence (Hennessy 1998, Adams et al. 2001, Roberts et. al. 2003). However, by the time that our survey was conducted, PROCAMPO had been effect for 14 years, meaning the program effects should have been capitalized into rental rates. Regardless of the ultimate cause, the low incidence supports evidence of PROCAMPO multiplier effects in household income of the poorest beneficiaries (Sadoulet, De Janvry, and Davis 2001, Tangerman 2006).

Table 4: Estimation Results of PROCAMPO Capitalization

Dependent Variable Average Rent per Ha (in logs)	OLS Estimates	.10 quantile	.25 quantile	.50 quantile	.75 quantile	.90 quantile
PROCAMPO per Ha (logs)	0.0012	-0.0025	-0.004	0.0051	0.0037	0.0013
	[0.0099]	[0.018]	[0.011]	[0.014]	[0.012]	[0.013]
Income Stratum 2 (Family subsistence with linkage to the market)	0.46**					
	[0.17]					
Income Stratum 3 (In transition)	0.78***					
	[0.24]					
Income Stratum 4 (Entrepreneurial with fragile profitability)	0.84***					
	[0.21]					
Income Stratum 5 (Thriving entrepreneurial)	1.16***					
	[0.28]					
Total crop area (logs)	−0.17**	-0.0078	0.029	0.000052	0.014	0.019
	[0.073]	[0.050]	[0.031]	[0.038]	[0.033]	[0.035]
% Rented Land (logs)	-0.018	-0.077	-0.061	-0.026	0.0053	-0.009
	[0.055]	[0.10]	[0.064]	[0.079]	[0.068]	[0.074]
Amount of other subsidies per Ha (logs)	0.0095	0.0056	0.013	-0.0052	-0.0029	-0.0092
	[0.0085]	[0.015]	[0.0095]	[0.012]	[0.010]	[0.011]
Dummy for credit access	0.37***	0.63***	0.53***	0.37***	0.24***	0.21**
	[0.091]	[0.13]	[0.081]	[0.10]	[0.086]	[0.093]
High quality soil	0.23***	0.0093	0.064	0.32***	0.17*	0.17*
	[0.073]	[0.15]	[0.091]	[0.11]	[0.095]	[0.10]
Medium quality soil	0.17**	0.019	0.17**	0.17*	0.071	0.054
	[0.081]	[0.12]	[0.074]	[0.091]	[0.078]	[0.085]
Low quality soil	0.019	-0.049	0.024	0.031	-0.008	−0.20*
	[0.087]	[0.16]	[0.098]	[0.12]	[0.10]	[0.11]
Yellow Corn (grain) (Highest Share in Value of Production)	0.00036	0.00015	0.00064	0.00041	0.000051	-0.000077
	[0.0017]	[0.0024]	[0.0015]	[0.0018]	[0.0015]	[0.0017]
White Corn (grain) (Highest Share in Value of Production)	0.0022	-0.000024	0.00052	0.0025**	0.0045***	0.0050***
	[0.0018]	[0.0015]	[0.00096]	[0.0012]	[0.0010]	[0.0011]
Sorghum (grain) (Highest Share in Value of Production)	0.00022	-0.00033	0.0006	-0.00079	0.0016	0.00042
	[0.0019]	[0.0022]	[0.0014]	[0.0017]	[0.0014]	[0.0016]
Beans (Highest Share in Value of Production)	-0.0027	−0.0084***	−0.011***	−0.0041*	0.0033*	0.0058***
	[0.0033]	[0.0028]	[0.0017]	[0.0021]	[0.0018]	[0.0020]
Other crops (Highest Share in Value of Production)	0.001	0.00051	0.000034	0.00074	0.0022	0.0023
	[0.0013]	[0.0024]	[0.0015]	[0.0018]	[0.0016]	[0.0017]
Number of hectares surpasses PROCAMPOś limit for rain-fed land	0.55***	1.03	1.02**	0.38	0.51	0.26
	[0.17]	[0.70]	[0.43]	[0.54]	[0.46]	[0.50]
% PROCAMPO′s take up by each State	0.015	-0.028	-0.01	0.015	0.014	0.026*
	[0.012]	[0.021]	[0.013]	[0.016]	[0.014]	[0.015]
Farm grows vegetables	0.085	-0.053	0.24	0.23	0.66***	0.64***
	[0.20]	[0.27]	[0.17]	[0.21]	[0.18]	[0.19]
South	−1.39***	−1.15***	−1.43***	−1.77***	−1.83***	−1.66***
	[0.19]	[0.19]	[0.12]	[0.15]	[0.13]	[0.14]
Center	−0.85***	−0.76***	−1.11***	−1.07***	−1.04***	−1.01***
	[0.16]	[0.17]	[0.11]	[0.13]	[0.11]	[0.12]
East	−0.72***	−0.72***	−0.90***	−1.06***	−1.11***	−1.04***
	[0.15]	[0.19]	[0.12]	[0.14]	[0.12]	[0.13]
West	−0.53**	−0.71***	−0.68***	−0.83***	−0.63***	−0.60***
	[0.19]	[0.18]	[0.11]	[0.13]	[0.11]	[0.12]
Constant	7.10***	7.35***	7.53***	7.81***	7.96***	8.25***
	[0.38]	[0.56]	[0.35]	[0.43]	[0.37]	[0.40]
Observations	576	576	576	576	576	576

Note: All the variables that are not categorical are included in logs. All the regional fixed effects are significant and negative, the more negative magnitude belonging to the Southern region, with the Northern region being the omitted category. Please refer to Appendix A to see the detailed results. Heteroskedasticity-robust standard errors are in brackets. *10% significance, **5% significance, ***1% significance.

5.1 Robustness Checks

To assess the robustness of the OLS and quantile regression results, we also considered four alternative specifications in which we dropped several variables that potentially could be endogenous even though similar variables are typically included in the literature. Specifically, we omitted the dummy for the farm surpassing the hectares limit for rain-fed land, the percentage of PROCAMPO take-up by each State, and the dummy signaling whether the farm grows vegetable crops. For all the specifications, the PROCAMPO per hectare estimate remains insignificant. The rest of the variables maintain similar magnitudes and significance across the different specifications. The results of these alternative specifications are included in Appendix A.

We further assessed the robustness of our results by exploring various specifications as well as estimating the incidence through a Heckman model to control for possible selection bias arising from the possibility that renters differ from landowners because if the intrinsic characteristics of renters versus landowners are associated with a higher PROCAMPO subsidy, then this effect would be captured in the error term, potentially generating biased estimates. Fortunately, the results shown in Appendix A show that there is no statistically significant evidence of selection bias in the OLS model (both with and without regional fixed effects).

Another possible empirical concern is that farmers are acting strategically in their use of PROCAMPO (or "gaming the system,") in a way that affects our results. One example would be tenants only producing to receive the subsidy, as highlighted earlier in the paper. We might also expect that farmers keep their farm size at or just below the upper limit of eligibility in order to take advantage of the PROCAMPO subsidy. As described in Section II, a set of 11 northern and northwestern states were allowed a higher upper limit of eligible hectares. Focusing on these 11 states, we find evidence of the farmers behaving strategically in most of those states except for Aguascalientes, Baja California Norte, Colima, and Zacatecas (see Appendix B for further details). We included the interactions of PROCAMPO with

different ranges of total land area to explore whether this strategic behavior had an effect on our results, and these variables were insignificant. However, the percentage of PROCAMPO take-up by state was significant for quantiles 50th, 75th and 90th, a result that could be capturing the gaming of the system that is observed in Appendix B. Namely, because 7 out of the 11 states that received PROCAMPO for productive reconversion concentrate their total land area near the upper limit to receive the highest amount of subsidy per hectare (e.g. the upper limit for Sinaloa was 10 hectares, and right after 10 hectares the percentage of farmers receiving PROCAMPO drops drastically, see Figure 7). Moreover those 11 states belong to the northern and northwestern states of Mexico, which are the richest states in the country, especially in agricultural terms.

6 Conclusion

In this research, we estimate the incidence of PROCAMPO on farmland rental rates. Two research questions are explored: What is the distribution of PROCAMPO subsidy among tenants and their landlords? And, how does this distribution differ across the tenant farm income distribution? This study makes three main contributions. First, to our knowledge we are the only authors thus far to study the incidence of farm subsidies on farmland rental rates in a developing country setting, while also exploring the effectiveness of "pro-poor" farm policy. Second, our dataset has not been used before. And third, we are the first to use quantile regression analysis to assess the distributional effects of the farmland subsidies.

We utilize a Ricardian model and the standard hedonic regression approach augmented by quantile regression analysis to investigate the incidence of the PROCAMPO program across the rental rate distribution paid by tenant farmers. After regional fixed effects are included, the estimated capitalization of the subsidy is near zero and statistically insignificant. Overall, these results suggest that the PROCAMPO subsidy is not passed through from tenant farmers to their landowners and thus the program is successfully supporting the income of

tenant farmers.

Our finding of very low to no incidence of PROCAMPO is inconsistent with much of the existing literature, but it is closer to recent literature in the context of the developed world that finds incidences as low as 20 cents (Kirwan 2009, Kilian et al. 2012, O'Neill and Hanrahan 2013, Kirwan and Roberts 2016). Moreover, given that those findings are for developed countries, another contribution of this paper is the conclusion that, at least for a developing country such as Mexico, the estimated incidence appears to be lower, especially compared to the older evidence from developed countries. The mechanism behind our findings is related to the fact that in a partial equilibrium model, such as our Ricardian model, the burden of the tax (in this case, the subsidy) depends on the elasticity of supply relative to the elasticity of demand, which make them ideal to study cases with imperfect competition (Fullerton and Metcalf 2002). In particular, with farms so small and below efficient scale, it may be harder for landowners to find alternative renters in the open market because larger farms, for instance, would have little value in renting isolated small plots. Another factor affecting the elasticities of demand and supply of land in our model is that the informal (and thin) nature of Mexican farmland markets may reduce price responses, with changes coming on other margins (Hendricks and Pokharel 2016; Li and Tsoodle 2017; Schlegel and Tsoodle 2011). This pattern suggests that prices do not always reflect the competitive rate (Perry and Robison 2001; Tsoodle, Golden and Featherstone 2006) and could be affected by strategic responses to the subsidy. Regardless of the ultimate cause, the low incidence supports evidence of PROCAMPO multiplier effects in household income of the poorest beneficiaries (Sadoulet, De Janvry, and Davis 2001, Tangerman 2006).

Our result that PROCAMPO is captured by tenant farmers suggests that the policy goal of helping farm household incomes is generally achieved. However, while the policy is achieving its stated goal, this does not mean that poverty reduction would not be more efficiently done by direct transfer payments to the poor and not in the form of a decoupled-land payments. In addition, while these results suggest that the incidence of Mexican land sub-

sidies is below estimates for developed countries (even the most recent estimates), there are so many institutional settings across developing countries that it is premature to generalize these findings elsewhere. That is, more research into other Latin American farm programs and programs in the developing world in general is called for. In particular, it is essential to understand the incidence of farmland policies in order to assess the effectiveness of programs aimed at lifting farm household incomes in the developing world, in which agriculture remains a very high share of economic activity.

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Appendix A: Detailed Regression Results

Table A.1: Detailed OLS Regression Results - Part 1

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
PROCAMPO per Ha (logs)	0.0012	0.0023	0.0021	0.00077	0.028	−0.0071
	[0.010]	[0.010]	[0.010]	[0.010]	[0.030]	[0.011]
Adjusted Heckman Estimate						0.114
Income Stratum 2 (Family subsistence with linkage to the market)	0.46**	0.45**	0.46**	0.46**	0.40**	0.46**
	[0.17]	[0.18]	[0.18]	[0.18]	[0.17]	[0.18]
Income Stratum 3 (In transition)	0.78***	0.76***	0.78***	0.80***	0.69***	0.79***
	[0.24]	[0.23]	[0.23]	[0.23]	[0.22]	[0.24]
Income Stratum 4 (Entrepreneurial with fragile profitability)	0.84***	0.83***	0.85***	0.86***	0.76***	0.85***
	[0.21]	[0.21]	[0.21]	[0.21]	[0.20]	[0.22]
Income Stratum 5 (Thriving entrepreneurial)	1.16***	1.17***	1.17***	1.18***	1.09***	1.17***
	[0.28]	[0.28]	[0.28]	[0.28]	[0.26]	[0.29]
Total crop area (logs)	−0.17**	−0.16**	−0.17**	−0.17**	−0.13**	−0.17**
	[0.073]	[0.066]	[0.069]	[0.068]	[0.059]	[0.071]
% Rented Land (logs)	−0.018	−0.014	−0.02	−0.017	−0.016	−0.0042
	[0.055]	[0.054]	[0.055]	[0.056]	[0.052]	[0.056]
Amount of other subsidies per Ha (logs)	0.0095	0.0098	0.0095	0.01	0.013	0.0089
	[0.0085]	[0.0084]	[0.0084]	[0.0082]	[0.0084]	[0.0083]
Dummy for credit access	0.37***	0.37***	0.37***	0.37***	0.36***	0.38***
	[0.091]	[0.096]	[0.095]	[0.094]	[0.095]	[0.090]
High quality soil	0.23***	0.23***	0.23***	0.23***	0.25***	0.23***
	[0.073]	[0.073]	[0.073]	[0.073]	[0.077]	[0.072]
Medium quality soil	0.17**	0.17**	0.17**	0.17**	0.18**	0.17**
	[0.081]	[0.081]	[0.081]	[0.081]	[0.077]	[0.081]
Low quality soil	0.019	0.022	0.028	0.021	0.044	0.02
	[0.087]	[0.090]	[0.087]	[0.089]	[0.075]	[0.089]
Yellow Corn (grain) (Highest Share in Value of Production)	0.00036	0.00043	0.00036	0.00016	0.00029	0.00032
	[0.0017]	[0.0016]	[0.0016]	[0.0016]	[0.0016]	[0.0017]
White Corn (grain) (Highest Share in Value of Production)	0.0022	0.0023	0.0023	0.002	0.0021	0.0022
	[0.0018]	[0.0017]	[0.0017]	[0.0016]	[0.0016]	[0.0018]

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

Table A.1: Detailed OLS Regression Results - Part 2

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
Sorghum (grain) (Highest Share in Value of Production)	0.00022 [0.0019]	0.000029 [0.0021]	0.00005 [0.0021]	0.000035 [0.0021]	0.00012 [0.0021]	0.00029 [0.0020]
Beans (Highest Share in Value of Production)	−0.0027 [0.0033]	−0.0027 [0.0032]	−0.0029 [0.0032]	−0.0029 [0.0032]	−0.0029 [0.0030]	−0.0027 [0.0033]
Other crops (Highest Share in Value of Production)	0.001 [0.0013]	0.0011 [0.0010]	0.00095 [0.0010]	0.00079 [0.0010]	0.00084 [0.0012]	0.001 [0.0013]
Farm surpasses hectaress limit for rainfed land	0.55*** [0.17]		0.57*** [0.17]	0.56*** [0.16]	0.35 [0.21]	0.57*** [0.17]
% PROCAMPO's takeup by each State	0.015 [0.012]			0.015 [0.012]		0.015 [0.012]
Vegetable crops	0.085 [0.20]					0.087 [0.20]
PROCAMPO by Total area < 5 hectares (logs)					−0.026 [0.035]	
PROCAMPO by Total area 5 to 20 hectares (logs)					−0.015 [0.029]	
PROCAMPO by Total area 20 to 40 hectares (logs)					−0.045 [0.029]	
PROCAMPO by Total area 40 to 60 hectares (logs)					−0.11*** [0.039]	
PROCAMPO by Total area 60 to 100 hectares (logs)					−0.048 [0.055]	

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

Table A.1: Detailed OLS Regression Results - Part 3

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
South	−1.39***	−1.33***	−1.35***	−1.39***	−1.37***	−1.40***
	[0.19]	[0.18]	[0.18]	[0.18]	[0.19]	[0.19]
Center	−0.85***	−0.79***	−0.83***	−0.85***	−0.83***	−0.86***
	[0.16]	[0.16]	[0.15]	[0.15]	[0.16]	[0.15]
East	−0.72***	−0.67***	−0.69***	−0.71***	−0.72***	−0.72***
	[0.15]	[0.16]	[0.15]	[0.15]	[0.16]	[0.15]
West	−0.53**	−0.50**	−0.51**	−0.53***	−0.54**	−0.54**
	[0.19]	[0.18]	[0.19]	[0.19]	[0.20]	[0.19]
lambda						0.13
						[0.11]
Constant	7.10***	7.10***	7.16***	7.11***	7.15***	6.86***
	[0.38]	[0.35]	[0.36]	[0.38]	[0.33]	[0.41]
Observations	576	576	576	576	576	576

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

Table A.2: Detailed 10th Quantile Regression Results - Part 1

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
PROCAMPO per Ha (logs)	−0.003	−0.003	−0.003	−0.002	−0.032	0.001
	[0.018]	[0.018]	[0.018]	[0.017]	[0.33]	[0.025]
Adjusted Heckman Estimate						0.119
Total crop area (logs)	−0.008	−0.006	−0.012	−0.006	0.003	−0.011
	[0.050]	[0.046]	[0.048]	[0.046]	[0.069]	[0.051]
% Rented Land (logs)	−0.077	−0.035	−0.073	−0.075	−0.190	−0.076
	[0.10]	[0.099]	[0.10]	[0.097]	[0.13]	[0.11]
Amount of other subsidies	0.006	0.009	0.007	0.006	0.006	0.007
	[0.015]	[0.015]	[0.015]	[0.014]	[0.019]	[0.015]
Dummy for credit access	0.63***	0.66***	0.63***	0.62***	0.54***	0.64***
	[0.13]	[0.13]	[0.13]	[0.12]	[0.16]	[0.13]
High quality soil	0.009	0.027	0.019	0.009	0.160	0.006
	[0.15]	[0.14]	[0.14]	[0.14]	[0.18]	[0.15]
Medium quality soil	0.019	0.033	0.013	0.026	0.160	0.023
	[0.12]	[0.11]	[0.11]	[0.11]	[0.15]	[0.12]
Low quality soil	−0.049	−0.023	−0.042	−0.039	0.110	−0.040
	[0.16]	[0.15]	[0.15]	[0.15]	[0.19]	[0.16]
Yellow Corn (grain) (Highest Share in Value of Production)	0.000	0.000	0.000	0.000	0.002	0.000
	[0.0024]	[0.0022]	[0.0022]	[0.0021]	[0.0028]	[0.0024]
White Corn (grain) (Highest Share in Value of Production)	0.000	0.000	0.000	0.000	0.000	0.000
	[0.0015]	[0.0013]	[0.0013]	[0.0013]	[0.0017]	[0.0015]
Sorghum (grain) (Highest Share in Value of Production)	0.000	0.000	0.000	0.000	−0.001	0.000
	[0.0022]	[0.0020]	[0.0020]	[0.0020]	[0.0026]	[0.0022]
Beans (Highest Share in Value of Production)	−0.0084***	−0.0079***	−0.0084***	−0.0081***	−0.0071**	−0.0081***
	[0.0028]	[0.0026]	[0.0026]	[0.0025]	[0.0033]	[0.0028]
Other crops (Highest Share in Value of Production)	0.001	0.000	0.000	0.001	0.001	0.001
	[0.0024]	[0.0022]	[0.0022]	[0.0022]	[0.0029]	[0.0024]
Farm surpasses hectares limit for rainfed land	1.030		1.080	1.000	1.060	1.000
	[0.70]		[0.68]	[0.65]	[1.45]	[0.70]
% PROCAMPO's takeup by each State	−0.028			−0.029		−0.028
	[0.021]			[0.019]		[0.021]

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

Table A.2: Detailed 10th Quantile Regression Results - Part 2

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
Vegetable crops	−0.053					−0.046
	[0.27]					[0.27]
PROCAMPO by Total area <5 hectares (logs)					−0.018	
					[0.33]	
PROCAMPO by Total area 5 to 20 hectares (logs)					0.050	
					[0.33]	
PROCAMPO by Total area 20 to 40 hectares (logs)					0.011	
					[0.33]	
PROCAMPO by Total area 40 to 60 hectares (logs)					−0.110	
					[0.34]	
PROCAMPO by Total area 60 to 100 hectares (logs)					−0.130	
					[0.35]	
South	−1.15***	−1.20***	−1.23***	−1.14***	−1.46***	−1.15***
	[0.19]	[0.18]	[0.18]	[0.18]	[0.24]	[0.19]
Center	−0.76***	−0.71***	−0.76***	−0.74***	−0.84***	−0.76***
	[0.17]	[0.16]	[0.16]	[0.16]	[0.21]	[0.17]
East	−0.72***	−0.70***	−0.72***	−0.71***	−0.84***	−0.71***
	[0.19]	[0.18]	[0.18]	[0.17]	[0.23]	[0.19]
West	−0.71***	−0.68***	−0.75***	−0.70***	−0.75***	−0.71***
	[0.18]	[0.17]	[0.17]	[0.16]	[0.22]	[0.18]
lambda						−0.031
						[0.25]
Constant	7.35***	7.06***	7.27***	7.32***	7.79***	7.38***
	[0.56]	[0.53]	[0.54]	[0.52]	[0.70]	[0.74]
Observations	576	576	576	576	576	576

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

Table A.3: Detailed 25th Quantile Regression Results - Part 1

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
PROCAMPO per Ha (logs)	−0.004	0.003	0.002	−0.003	0.053	0.004
	[0.011]	[0.012]	[0.013]	[0.012]	[0.16]	[0.015]
Adjusted Heckman Estimate						0.121
Total crop area (logs)	0.029	0.030	0.022	0.024	0.038	0.023
	[0.031]	[0.032]	[0.034]	[0.033]	[0.033]	[0.031]
% Rented Land (logs)	−0.061	−0.033	−0.051	−0.057	−0.050	−0.075
	[0.064]	[0.068]	[0.072]	[0.069]	[0.061]	[0.066]
Amount of other subsidies	0.013	0.009	0.008	0.012	0.015	0.014
	[0.0095]	[0.010]	[0.011]	[0.010]	[0.0091]	[0.0095]
Dummy for credit access	0.53***	0.47***	0.50***	0.52***	0.44***	0.54***
	[0.081]	[0.086]	[0.090]	[0.087]	[0.077]	[0.081]
High quality soil	0.064	0.065	0.065	0.073	0.067	0.078
	[0.091]	[0.096]	[0.10]	[0.098]	[0.087]	[0.090]
Medium quality soil	0.17**	0.16**	0.16*	0.19**	0.18**	0.18**
	[0.074]	[0.078]	[0.082]	[0.080]	[0.070]	[0.074]
Low quality soil	0.024	−0.008	0.003	0.033	0.004	0.023
	[0.098]	[0.10]	[0.11]	[0.11]	[0.092]	[0.097]
Yellow Corn (grain) (Highest Share in Value of Production)	0.001	0.000	0.000	0.000	0.000	0.001
	[0.0015]	[0.0015]	[0.0016]	[0.0015]	[0.0013]	[0.0015]
White Corn (grain) (Highest Share in Value of Production)	0.001	0.000	0.000	0.000	0.000	0.001
	[0.00096]	[0.00090]	[0.00094]	[0.00094]	[0.00080]	[0.00095]
Sorghum (grain) (Highest Share in Value of Production)	0.001	0.000	0.000	0.000	0.000	0.001
	[0.0014]	[0.0014]	[0.0015]	[0.0014]	[0.0012]	[0.0014]
Beans (Highest Share in Value of Production)	−0.011***	−0.012***	−0.012***	−0.011***	−0.011***	−0.011***
	[0.0017]	[0.0018]	[0.0019]	[0.0018]	[0.0016]	[0.0017]
Other crops (Highest Share in Value of Production)	0.000	0.000	−0.001	0.000	0.000	0.000
	[0.0015]	[0.0015]	[0.0016]	[0.0015]	[0.0014]	[0.0015]
Farm surpasses hectares limit for rainfed land	1.02**		0.96**	1.00**	0.800	1.03**
	[0.43]		[0.48]	[0.47]	[0.69]	[0.43]
% PROCAMPO's takeup by each State	−0.010			−0.008		−0.008
	[0.013]			[0.014]		[0.013]

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

Table A.3: Detailed 25th Quantile Regression Results - Part 2

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
Vegetable crops	0.240					0.230
	[0.17]					[0.17]
PROCAMPO by Total area <5 hectares (logs)					−0.063	
					[0.16]	
PROCAMPO by Total area 5 to 20 hectares (logs)					−0.025	
					[0.16]	
PROCAMPO by Total area 20 to 40 hectares (logs)					−0.055	
					[0.16]	
PROCAMPO by Total area 40 to 60 hectares (logs)					−0.170	
					[0.16]	
PROCAMPO by Total area 60 to 100 hectares (logs)					−0.046	
					[0.17]	
South	−1.43***	−1.40***	−1.44***	−1.38***	−1.48***	−1.43***
	[0.12]	[0.12]	[0.13]	[0.13]	[0.11]	[0.12]
Center	−1.11***	−1.10***	−1.14***	−1.08***	−1.09***	−1.12***
	[0.11]	[0.11]	[0.12]	[0.11]	[0.100]	[0.11]
East	−0.90***	−0.90***	−0.92***	−0.87***	−0.98***	−0.93***
	[0.12]	[0.12]	[0.13]	[0.12]	[0.11]	[0.12]
West	−0.68***	−0.67***	−0.66***	−0.64***	−0.76***	−0.69***
	[0.11]	[0.11]	[0.12]	[0.12]	[0.10]	[0.11]
lambda						−0.079
						[0.16]
Constant	7.53***	7.45***	7.55***	7.52***	7.49***	7.69***
	[0.35]	[0.36]	[0.39]	[0.38]	[0.33]	[0.46]
Observations	576	576	576	576	576	576

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

Table A.4: Detailed 50th Quantile Regression Results - Part 1

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
PROCAMPO per Ha (logs)	0.005	0.013	0.011	0.007	0.043	0.010
	[0.014]	[0.014]	[0.015]	[0.014]	[0.22]	[0.019]
Adjusted Heckman Estimate						0.128
Total crop area (logs)	0.000	0.012	0.001	−0.004	0.056	0.001
	[0.038]	[0.038]	[0.040]	[0.039]	[0.046]	[0.038]
% Rented Land (logs)	−0.026	0.005	−0.001	0.003	0.006	−0.020
	[0.079]	[0.082]	[0.083]	[0.081]	[0.085]	[0.081]
Amount of other subsidies	−0.005	−0.002	−0.001	0.001	0.002	−0.006
	[0.012]	[0.012]	[0.012]	[0.012]	[0.013]	[0.012]
Dummy for credit access	0.37***	0.35***	0.36***	0.36***	0.33***	0.36***
	[0.10]	[0.10]	[0.10]	[0.10]	[0.11]	[0.099]
High quality soil	0.32***	0.33***	0.34***	0.35***	0.26**	0.30***
	[0.11]	[0.12]	[0.12]	[0.11]	[0.12]	[0.11]
Medium quality soil	0.17*	0.150	0.16*	0.18*	0.20**	0.17*
	[0.091]	[0.095]	[0.095]	[0.093]	[0.098]	[0.090]
Low quality soil	0.031	0.078	0.091	0.067	0.089	0.025
	[0.12]	[0.12]	[0.13]	[0.12]	[0.13]	[0.12]
Yellow Corn (grain) (Highest Share in Value of Production)	0.000	−0.001	−0.001	−0.001	−0.001	0.000
	[0.0018]	[0.0018]	[0.0018]	[0.0018]	[0.0018]	[0.0018]
White Corn (grain) (Highest Share in Value of Production)	0.0025**	0.0023**	0.0022**	0.002	0.0022**	0.0024**
	[0.0012]	[0.0011]	[0.0011]	[0.0011]	[0.0011]	[0.0012]
Sorghum (grain) (Highest Share in Value of Production)	−0.001	−0.002	−0.002	−0.002	−0.001	−0.001
	[0.0017]	[0.0017]	[0.0017]	[0.0016]	[0.0017]	[0.0017]
Beans (Highest Share in Value of Production)	−0.0041*	−0.0051**	−0.0054**	−0.0048**	−0.0044**	−0.0041**
	[0.0021]	[0.0021]	[0.0022]	[0.0021]	[0.0022]	[0.0021]
Other crops (Highest Share in Value of Production)	0.001	−0.001	0.000	0.000	−0.001	0.001
	[0.0018]	[0.0018]	[0.0018]	[0.0018]	[0.0019]	[0.0018]
Farm surpasses hectares limit for rainfed land	0.380		0.530	0.340	0.370	0.380
	[0.54]		[0.56]	[0.54]	[0.96]	[0.53]
% PROCAMPO's takeup by each State	0.015			0.017		0.014
	[0.016]			[0.016]		[0.016]

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

Table A.4: Detailed 50th Quantile Regression Results - Part 2

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
Vegetable crops	0.230					0.230
	[0.21]					[0.21]
PROCAMPO by Total area <5 hectares (logs)					−0.031	
					[0.22]	
PROCAMPO by Total area 5 to 20 hectares (logs)					−0.027	
					[0.22]	
PROCAMPO by Total area 20 to 40 hectares (logs)					−0.062	
					[0.22]	
PROCAMPO by Total area 40 to 60 hectares (logs)					−0.098	
					[0.22]	
PROCAMPO by Total area 60 to 100 hectares (logs)					−0.074	
					[0.23]	
South	−1.77***	−1.65***	−1.65***	−1.72***	−1.69***	−1.76***
	[0.15]	[0.15]	[0.15]	[0.15]	[0.16]	[0.15]
Center	−1.07***	−0.94***	−0.96***	−1.00***	−1.01***	−1.06***
	[0.13]	[0.13]	[0.13]	[0.13]	[0.14]	[0.13]
East	−1.06***	−0.98***	−0.98***	−0.96***	−1.06***	−1.06***
	[0.14]	[0.15]	[0.15]	[0.14]	[0.15]	[0.14]
West	−0.83***	−0.70***	−0.69***	−0.75***	−0.81***	−0.82***
	[0.13]	[0.14]	[0.14]	[0.14]	[0.14]	[0.13]
lambda						−0.045
						[0.19]
Constant	7.81***	7.66***	7.71***	7.68***	7.65***	7.85***
	[0.43]	[0.44]	[0.45]	[0.44]	[0.46]	[0.56]
Observations	576	576	576	576	576	576

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

Table A.5: Detailed 75th Quantile Regression Results - Part 1

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
PROCAMPO per Ha (logs)	0.004	−0.001	−0.001	0.000	0.093	−0.001
	[0.012]	[0.011]	[0.011]	[0.012]	[0.17]	[0.016]
Adjusted Heckman Estimate						0.117
Total crop area (logs)	0.014	0.015	0.014	0.020	0.010	0.015
	[0.033]	[0.029]	[0.030]	[0.033]	[0.036]	[0.032]
% Rented Land (logs)	0.005	0.007	0.005	0.010	0.012	0.003
	[0.068]	[0.062]	[0.063]	[0.068]	[0.067]	[0.067]
Amount of other subsidies	−0.003	0.001	0.001	0.001	0.003	−0.005
	[0.010]	[0.0091]	[0.0092]	[0.010]	[0.0100]	[0.0097]
Dummy for credit access	0.24***	0.24***	0.24***	0.24***	0.19**	0.25***
	[0.086]	[0.078]	[0.079]	[0.086]	[0.085]	[0.082]
High quality soil	0.17*	0.20**	0.20**	0.18*	0.150	0.18*
	[0.095]	[0.087]	[0.088]	[0.096]	[0.096]	[0.092]
Medium quality soil	0.071	0.088	0.086	0.069	0.051	0.068
	[0.078]	[0.071]	[0.072]	[0.078]	[0.078]	[0.075]
Low quality soil	−0.008	0.017	0.017	0.008	−0.014	−0.009
	[0.10]	[0.094]	[0.095]	[0.10]	[0.10]	[0.099]
Yellow Corn (grain) (Highest Share in Value of Production)	0.000	0.000	0.000	0.000	−0.001	0.000
	[0.0015]	[0.0013]	[0.0014]	[0.0015]	[0.0015]	[0.0015]
White Corn (grain) (Highest Share in Value of Production)	0.0045***	0.0044***	0.0044***	0.0043***	0.0039***	0.0046***
	[0.0010]	[0.00082]	[0.00083]	[0.00093]	[0.00088]	[0.00097]
Sorghum (grain) (Highest Share in Value of Production)	0.002	0.001	0.001	0.002	0.001	0.002
	[0.0014]	[0.0013]	[0.0013]	[0.0014]	[0.0014]	[0.0014]
Beans (Highest Share in Value of Production)	0.0033*	0.0036**	0.0036**	0.0032*	0.003	0.0036**
	[0.0018]	[0.0016]	[0.0016]	[0.0018]	[0.0017]	[0.0017]
Other crops (Highest Share in Value of Production)	0.002	0.002	0.002	0.002	0.002	0.002
	[0.0016]	[0.0014]	[0.0014]	[0.0015]	[0.0015]	[0.0015]
Farm surpasses hectares limit for rainfed land	0.510		0.460	0.490	−0.024	0.540
	[0.46]		[0.42]	[0.46]	[0.76]	[0.44]
% PROCAMPO's takeup by each State	0.014			0.015		0.014
	[0.014]			[0.014]		[0.013]

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

Table A.5: Detailed 75th Quantile Regression Results - Part 2

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
Vegetable crops	0.66***					0.67***
	[0.18]					[0.17]
PROCAMPO by Total area <5 hectares (logs)					−0.099	
					[0.17]	
PROCAMPO by Total area 5 to 20 hectares (logs)					−0.082	
					[0.17]	
PROCAMPO by Total area 20 to 40 hectares (logs)					−0.096	
					[0.18]	
PROCAMPO by Total area 40 to 60 hectares (logs)					−0.130	
					[0.18]	
PROCAMPO by Total area 60 to 100 hectares (logs)					−0.070	
					[0.18]	
South	−1.83***	−1.82***	−1.82***	−1.84***	−1.81***	−1.83***
	[0.13]	[0.11]	[0.11]	[0.13]	[0.12]	[0.12]
Center	−1.04***	−1.03***	−1.03***	−1.04***	−1.05***	−1.05***
	[0.11]	[0.098]	[0.10]	[0.11]	[0.11]	[0.11]
East	−1.11***	−1.01***	−1.01***	−1.03***	−1.03***	−1.10***
	[0.12]	[0.11]	[0.11]	[0.12]	[0.12]	[0.12]
West	−0.63***	−0.68***	−0.69***	−0.63***	−0.67***	−0.65***
	[0.11]	[0.10]	[0.11]	[0.12]	[0.11]	[0.11]
lambda						0.100
						[0.16]
Constant	7.96***	8.02***	8.03***	7.95***	8.07***	7.82***
	[0.37]	[0.33]	[0.34]	[0.37]	[0.36]	[0.46]
Observations	576	576	576	576	576	576

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

Table A.6: Detailed 90th Quantile Regression Results - Part 1

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
PROCAMPO per Ha (logs)	0.001	−0.007	−0.013	−0.007	0.079	−0.003
	[0.013]	[0.017]	[0.015]	[0.016]	[0.24]	[0.020]
Adjusted Heckman Estimate						0.115
Total crop area (logs)	0.019	−0.012	−0.023	−0.016	−0.024	0.012
	[0.035]	[0.044]	[0.041]	[0.042]	[0.050]	[0.041]
% Rented Land (logs)	−0.009	−0.007	−0.032	−0.011	−0.005	−0.017
	[0.074]	[0.095]	[0.086]	[0.088]	[0.092]	[0.086]
Amount of other subsidies	−0.009	−0.008	−0.010	−0.009	−0.010	−0.011
	[0.011]	[0.014]	[0.013]	[0.013]	[0.014]	[0.012]
Dummy for credit access	0.21**	0.23*	0.21*	0.21*	0.21*	0.21*
	[0.093]	[0.12]	[0.11]	[0.11]	[0.12]	[0.11]
High quality soil	0.17*	0.23*	0.24**	0.21*	0.210	0.170
	[0.10]	[0.13]	[0.12]	[0.12]	[0.13]	[0.12]
Medium quality soil	0.054	0.092	0.095	0.046	0.088	0.046
	[0.085]	[0.11]	[0.098]	[0.10]	[0.11]	[0.096]
Low quality soil	−0.20*	−0.210	−0.210	−0.25*	−0.230	−0.21*
	[0.11]	[0.14]	[0.13]	[0.13]	[0.14]	[0.13]
Yellow Corn (grain) (Highest Share in Value of Production)	0.000	−0.001	−0.001	−0.001	−0.001	0.000
	[0.0017]	[0.0021]	[0.0019]	[0.0019]	[0.0020]	[0.0019]
White Corn (grain) (Highest Share in Value of Production)	0.0050***	0.0046***	0.0047***	0.0043***	0.0047***	0.0050***
	[0.0011]	[0.0013]	[0.0011]	[0.0012]	[0.0012]	[0.0012]
Sorghum (grain) (Highest Share in Value of Production)	0.000	0.000	0.000	0.000	−0.001	0.001
	[0.0016]	[0.0019]	[0.0017]	[0.0018]	[0.0019]	[0.0018]
Beans (Highest Share in Value of Production)	0.0058***	0.004	0.0037*	0.004	0.004	0.0055**
	[0.0020]	[0.0025]	[0.0022]	[0.0023]	[0.0024]	[0.0022]
Other crops (Highest Share in Value of Production)	0.002	0.002	0.002	0.002	0.002	0.002
	0.002	0.002	0.002	0.002	0.002	
	[0.0017]	[0.0021]	[0.0019]	[0.0020]	[0.0021]	[0.0019]
Farm surpasses hectares limit for rainfed land	0.260		0.350	0.320	−0.170	0.300
	[0.50]		[0.58]	[0.60]	[1.04]	[0.56]

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

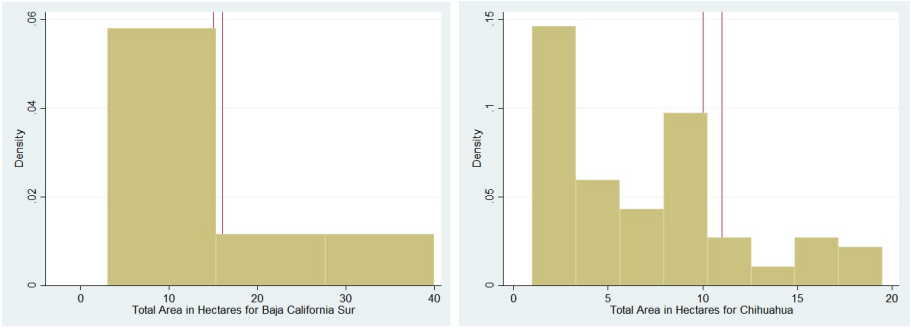
Table A.6: Detailed 90th Quantile Regression Results - Part 2

Dependent Variable: Average Rent per Ha (in logs)	OLS Estimates with Regional Fixed Effects					Heckman Estimates with Regional Fixed Effects
	Main	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
% PROCAMPO's takeup by each State	0.026*			0.027		0.027
	[0.015]			[0.018]		[0.017]
Vegetable crops	0.64***					0.65***
	[0.19]					[0.22]
PROCAMPO by Total area <5 hectares (logs)					−0.083	
					[0.24]	
PROCAMPO by Total area 5 to 20 hectares (logs)					−0.091	
					[0.24]	
PROCAMPO by Total area 20 to 40 hectares (logs)					−0.085	
					[0.24]	
PROCAMPO by Total area 40 to 60 hectares (logs)					−0.085	
					[0.24]	
PROCAMPO by Total area 60 to 100 hectares (logs)					−0.081	
					[0.25]	
South	−1.66***	−1.70***	−1.76***	−1.74***	−1.75***	−1.68***
	[0.14]	[0.17]	[0.16]	[0.17]	[0.17]	[0.16]
Center	−1.01***	−1.01***	−1.09***	−1.02***	−1.06***	−1.03***
	[0.12]	[0.15]	[0.14]	[0.14]	[0.15]	[0.14]
East	−1.04***	−0.92***	−0.97***	−0.98***	−0.96***	−1.08***
	[0.13]	[0.17]	[0.15]	[0.16]	[0.16]	[0.15]
West	−0.60***	−0.54***	−0.59***	−0.56***	−0.57***	−0.66***
	[0.12]	[0.16]	[0.14]	[0.15]	[0.16]	[0.14]
lambda						0.036
						[0.20]
Constant	8.25***	8.46***	8.65***	8.45***	8.52***	8.27***
	[0.40]	[0.51]	[0.46]	[0.48]	[0.50]	[0.59]
Observations	576	576	576	576	576	576

Notes: Heteroskedasticity-robust standard errors are in brackets. * 10% significance, ** 5% significance, *** 1% significance.

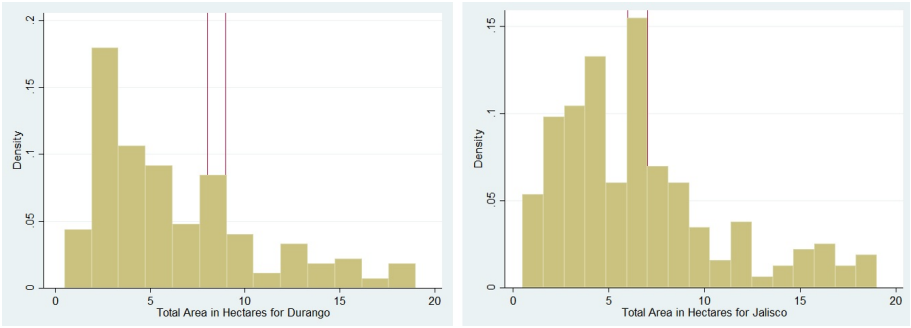
Appendix B: Evidence of Strategic Behavior

Figure 5: States with Evidence of Strategic Behavior: Baja California Sur and Chihuahua



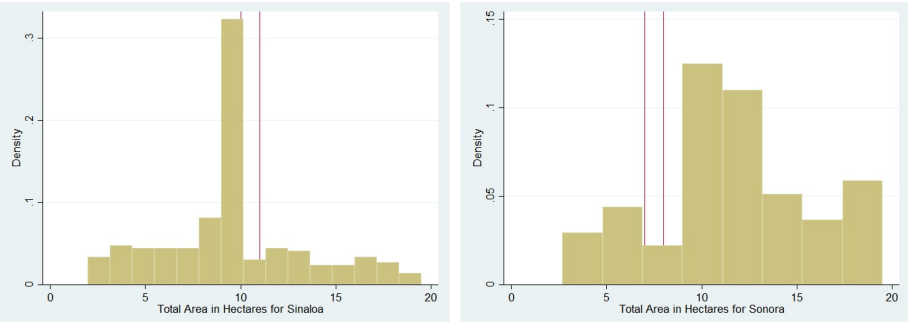
Note: The graphs show two lines. The first one identifies the area limit for each state, and the second line represents one more hectare added to this limit. The hectares below the first line are supported with a higher PROCAMPO rate, 10 dollars higher than for those hectares above that line. Gaming of the system is occurring because farmers, understanding the rules of the program, decide to behave such that they, on average, concentrate their total area near the upper limit to receive the highest amount of the subsidy per hectare. This happens because having one more hectare of land will increase the subsidy they get by around 10 less dollars per hectare for the total area they cultivate.

Figure 6: States with Evidence of Strategic Behavior: Durango and Jalisco



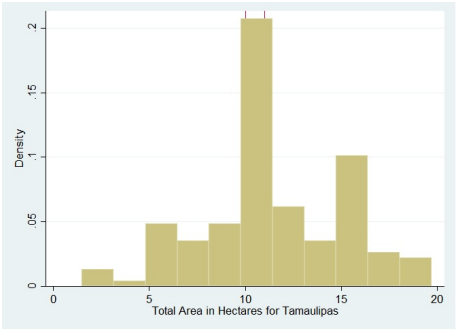
Note: The graphs show two lines. The first one identifies the area limit for each state, and the second line represents one more hectare added to this limit. The hectares below the first line are supported with a higher PROCAMPO rate, 10 dollars higher than for those hectares above that line. Gaming of the system is occurring because farmers, understanding the rules of the program, decide to behave such that they, on average, concentrate their total area near the upper limit to receive the highest amount of the subsidy per hectare. This happens because having one more hectare of land will increase the subsidy they get by around 10 less dollars per hectare for the total area they cultivate.

Figure 7: States with Evidence of Strategic Behavior: Sinaloa and Sonora



Note: The graphs show two lines. The first one identifies the area limit for each state, and the second line represents one more hectare added to this limit. The hectares below the first line are supported with a higher PROCAMPO rate, 10 dollars higher than for those hectares above that line. Gaming of the system is occurring because farmers, understanding the rules of the program, decide to behave such that they, on average, concentrate their total area near the upper limit to receive the highest amount of the subsidy per hectare. This happens because having one more hectare of land will increase the subsidy they get by around 10 less dollars per hectare for the total area they cultivate.

Figure 8: States with Evidence of Strategic Behavior: Tamaulipas



Note: The graphs show two lines. The first one identifies the area limit for each state, and the second line represents one more hectare added to this limit. The hectares below the first line are supported with a higher PROCAMPO rate, 10 dollars higher than for those hectares above that line. Gaming of the system is occurring because farmers, understanding the rules of the program, decide to behave such that they, on average, concentrate their total area near the upper limit to receive the highest amount of the subsidy per hectare. This happens because having one more hectare of land will increase the subsidy they get by around 10 less dollars per hectare for the total area they cultivate.