The Impact of Elite Farmers on Cocoa Pests and Diseases in Ghana and Côte d’Ivoire

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This paper investigates the causal effects of elite favoritism for the case of cocoa production in rural Ghana and Côte d’Ivoire through the pathways of government support policy and de facto land tenure systems using secondary cross-sectional data from 2,228 cocoa households. Econometric models motivated by spatial regression discontinuity design (RDD) framework were adapted to capture the causal effect of being elite farmers in Ghana. The results showed that elites in Ghana were less likely to suffer black pod disease infection due to their social status relative to non-elites in Ghana. Further investigating possible causal pathways to these effects, elites in Ghana were more likely to receive pesticides, cocoa seedlings, and liquid fertilizer from government. There was no evidence of stronger land rights by elites in Ghana. Hence, better access to policy might be a relevant factor in explaining elite favoritism in pests and diseases management than stronger land rights.

Key words: Elite, Cocoa, Ghana, Côte d’Ivoire, Spatial RDD

1. Introduction

The debate on the effect of local elite on rural economy and development has remained a topical issue among development economists focusing on the political economy of rural and agricultural development. For example, by having stronger land rights due to their power in the traditional political hierarchy, elite farmers in Ghana invested more in land fertility in the form of longer fallow durations leading to greater agricultural output (Goldstein & Udry, 2008). Such influential elite effect is even greater in rural Vietnam, where households with connections to political or bureaucratic office holders strengthened their de facto land rights and access to credit and transfers, increasing their investment in land improvements (Markussen & Tarp, 2014). However, in a study of economic consequences of corruption in rural Liberia, Beekman et al. (2013) found evidence of diversion of resources for development projects by chiefs, negatively affecting economic activities. Further testing this hypothesis of elite capture of local common resources, Voors et al. (2018) found little evidence of project resources captured by local elites in a field experiment in Sierra Leone. However, they observed that local elites were better managers of development projects (Voors et al., 2018). While elites positively affected rural development projects without capturing project resources (Voors et al., 2018), there is strong evidence of elites diverting resources for development projects (Beekman et al., 2013).

This study estimates the causal effect of elite farmers on cocoa pests and diseases in Ghana and Côte d’Ivoire. Throughout the paper, we define elite farmers

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1. Introduction

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This study estimates the causal effect of elite farmers on cocoa pests and diseases in Ghana and Côte d’Ivoire. Throughout the paper, we define elite farmers
as individuals in village political and social hierarchy (e.g., village heads and assembly members). Cocoa has been a major source of foreign exchange (Bangmarigu & Qinetti, 2018) and livelihood for many poor farmers in Ghana and Côte d’Ivoire. West Africa accounts for approximately 75% of the world’s cocoa beans supply, majority of which comes from Côte d’Ivoire (45%) and Ghana (20%) (Statista, 2021). However, the cocoa sector faces several challenges (see Laven et al., 2017), including pests and diseases (Bymolt, Laven, & Tyszler, 2018). Controlling these pests and diseases significantly impacts cocoa output (Wessel & Quist-Wessel, 2015; Aneani et al., 2011). Hence, cocoa pests and diseases management is critical for sustainable cocoa production and protecting the livelihood sources of cocoa farmers in Ghana and Côte d’Ivoire. Also, cocoa production in Ghana and Côte d’Ivoire provides a good example to investigate the effects of elite on agriculture. First, cocoa production in both countries suffers from similar pests and diseases. Second, Ghana and Côte d’Ivoire share divergent de jure land tenure systems (Bubb, 2013) and cocoa policies (Bymolt et al., 2018). These divergent de jure land tenure systems and different cocoa support policies in the two countries provide favorable settings to analyze the effects of being elite on cocoa production through such pathways as land tenure and government support policy.

However, though the de jure land tenure system is different between Ghana and Côte d’Ivoire, studies suggest that de facto land rights are similar in both countries. For example, Bubb (2013) shows no difference in de facto land rights at the border. Also, Ubink and Amanor (2008) narrate instances local communities in Côte d’Ivoire maintained their claims to land based on custom contrary to formal state laws of private land ownership due to privileges of strong land rights of local elites associated with customary ownership. These studies are not surprising as MacLean (2009) observed similar ethnicity and cultural norms in the border region of Ghana and Côte d’Ivoire due to similar precolonial histories. This suggests that the difference in cocoa management is not driven by de facto land rights, a priori. Hence, the need to seek an alternative pathway (i.e., policy support) to explain cocoa management differences. However, there is room to test the actual differences in de facto land tenure system and policy support in our empirical study. Therefore, in the empirical approach, we also test for the possibility of land tenure system as an alternative explanation to cocoa management in Ghana and Côte d’Ivoire, as this remains an empirical question of interest.

The empirical evidence on elite effect in the literature is mixed and requires further studies. Previous studies also focused on only stronger land rights to explain the causal link of elite effect. However, our paper provides two possible explanations for the causal link between local elite farmers and pests and diseases management, say land rights and policy access, and tested which one is a more plausible explanation for the case of cocoa production in Ghana. The uniqueness of our study lies in the additional exploitation of policy access, whereas most related studies (Bubb, 2013; Fenske, 2011; Goldstein & Udry, 2008) in the context of African agriculture focused on only land rights. Fenske (2011) provides reviews of contradictory studies of land tenure and investment incentives in the context of West Africa.

We estimate the causal impact of being elite farmer in Ghana on pest and disease infection using a framework motivated by spatial regression discontinuity design (RDD). The spatial RDD is generally used in a setting where a geographical boundary exogenously separates treatment to estimate a local causal effect. Lee and Lemieux (2010) give a general RDD framework. Bubb (2013) used the discontinuous change in state laws at the border of Ghana and Côte d’Ivoire to estimate the effect on property rights institutions and economic outcomes. Also, Kosec and Mogues (2020) used a spatial RDD to study the effects of decentralization in rural Ethiopia on the delivery of agricultural public services. This empirical strategy is relevant to this research as the borders of African states were arbitrarily drawn without attention to ethnic differen-
ces (Alesina et al., 2011) hence providing similar ethnic groups on either side of the exogenous border. Hence, discrete changes in policy (and state laws) at the national border between Ghana and Côte d’Ivoire enable us to exploit the spatial discontinuity in government support programs between Ghana and Côte d’Ivoire by restricting attention to areas closer to the border to quantify the benefits of being elite in cocoa production. The results show that Ghanaian elite farmers were less exposed to cocoa black pod disease, which causes significant economic harm to cocoa plantations and threatens the livelihood source of farmers. Also, Ghanaian elite farmers were more likely to benefit from governmental input support to farmers in Ghana, providing a plausible explanation for low infection rates of black pod disease among Ghanaian elites.

The remainder of the paper proceeds as follows. In section 2, we describe the methodology considering the data, research hypotheses, empirical strategy, validation of the assumption for a causal interpretation of the results, and test of the hypotheses. Next, we present and discuss the results of the various estimations in section 3, and finally, we draw conclusions based on the major findings and provide policy implications and recommendations for consideration in section 4.

2. Methodology

(1) Study area and data

The study used secondary cross-sectional data from the Royal Tropical Institute (KIT) household survey in cocoa-growing regions in Ghana and Côte d’Ivoire in late 2016 and early 2017, respectively (Tyszler et al., 2018). The sample size was 2,228 cocoa households: Ghana (1,318) and Côte d’Ivoire (910). However, we restrict the sample to 878 cocoa households within 100 km distance on either side of the border, with 634 in Ghana and 244 in Côte d’Ivoire, as these areas converge in geography, precolonial ethnic groups, and institutions (Bubb, 2013), as well as observable characteristics except policy support and de jure land tenure.

We test for differences in the outcome variables between the two countries using the full sample and a sub-sample restricted to only villages near the border region on either side of Ghana and Côte d’Ivoire. The infection rate of black pod disease in Ghana (44.23%) is significantly higher than in Côte d’Ivoire (12.22%) ($t = 18.31$) in the full sample (Table 1, Panel A). In the restricted sample to the border, the magnitude of the statistical difference declined ($t = 9.63$) (Table 1, Panel B). Similarly, the capsid pest infestation rate differs significantly in the full sample ($t = 11.89$). However, as the sample converges to the border, the statistical difference declined ($t = 3.36$) but remains significant.

The Cocoa Swollen Shoot Virus Disease (CSSVD) infection rate is insignificant in both samples (Table 1). The difference in infection rates for black pod and capsid in the sub-sample, though lower, remain significant. We exploit this regional variation in infection rates of pests and diseases to study the causal effect of elite in Ghana at the border region. In both countries, cocoa farmers in villages near the border region face similar pest and disease prevalence challenges: black pod disease, CSSVD, and capsid pest.

(2) Research hypotheses

While Ghana’s customary land tenure system gives elites more secure land rights than non-elites (Bassett et al., 2020; Lanz, Gerber, & Haller, 2018; Goldstein &

Table 1. Infection rates of pests and diseases (%)

|                  | Ghana  | Côte d’Ivoire | $|t|$  |
|------------------|--------|---------------|------|
| **Panel A: Full Sample** |        |               |      |
| Black pod        | 44.23  | 12.22         | 18.31|
| CSSVD            | 14.42  | 16.19         | 1.14 |
| Capsid           | 50.08  | 26.21         | 11.89|
| N                | 1318   | 908           |      |
| **Panel B: Sub-Sample$^1$** |        |               |      |
| Black pod        | 50.95  | 19.75         | 9.63 |
| CSSVD            | 17.35  | 14.40         | 1.09 |
| Capsid           | 54.10  | 41.56         | 3.36 |
| N                | 634    | 243           |      |

Data Source: Tyszler et al. (2018)

$^1$ Sub-sample within a bandwidth of 100 km distance.
Udry, 2008), private land ownership under state laws in Côte d'Ivoire does not guarantee such differential land rights to elites and non-elites as privatization limits the extent of the power exercised by elites over land. However, irrespective of different state laws on land tenure in Ghana and Côte d’Ivoire, de facto land tenure converges at the border between the two countries, as shown by Bubb (2013). Hence, no difference in land rights is expected in the border region across both countries, a priori. The security of tenure over land increases willingness to invest (Feder, 1988), leading to increased agricultural productivity (Place, 2009). Also, as the access to credit and transfers improves with stronger land rights (Markussen & Tarp, 2014), elite farmers under the customary land tenure system in Ghana can therefore purchase pesticides and fungicides through credit or transfers to control capsid pests and black pod diseases, respectively. Landowners-managed cocoa farms are more productive than those managed by sharecroppers (Asamoah & Owusu-Ansah, 2017). Sharecroppers, usually non-elites, specifically do not have the right to cut down cocoa trees as the land would return to the original owners (Bymolt et al., 2018), hence a significant setback to the control of CSSVD (CRIG, 2011). Hence, stronger land rights are vital for effective control of CSSVD, capsid pests, and black pod disease.

Also, the active involvement of the Ghanaian government in the cocoa sector (Ton et al., 2008), as opposed to the market-oriented system in Côte d’Ivoire, led to many interventions to support cocoa farmers in Ghana. For example, the Cocoa Disease and Pest Control (CODAPEC) program initiated in 2001 (Aneani et al., 2011) led to mass spraying of cocoa farms to control pests and diseases, especially capsid pests and black pod diseases. Also, through the Cocoa High Technology (Hi-Tech) program, farmers in Ghana received various inputs support, including fertilizers, pesticides, and improved planting materials to boost cocoa productivity. The Cocoa Hi-Tech and Mass Spraying Programs significantly increased cocoa yield (Omane-Adjepong & Oduro, 2012). The introduction of the Cocoa Rehabilitation Scheme Program (CORIP) rendered technical support and compensation to farmers to control CSSVD by cutting whole infected farms and replanting disease tolerant varieties.

Like Ghana, cocoa farmers in Côte d’Ivoire had hybrid seedlings through government support, but this support is stronger in Ghana (Bymolt et al., 2018). However, unlike in Ghana, there are no significant policy interventions to support cocoa farmers in other inputs. Therefore, a significant difference in factors that affect the effects of elite on cocoa production is policy support.

Our main hypothesis is that the elite farmer in Ghana has better access to policy support leading to effective management of pests and diseases. As Ghana and Côte d’Ivoire share the same ethnicity at the border region, residents most likely would follow the same de facto land tenure system, irrespective of the different de jure land tenure systems in both states. Therefore, the pathway involving cocoa policies significantly differs between the two countries resulting from different state policies. Hence, the elite effect on pests and diseases is likely driven only by differences in policy support but not land rights.

(3) Empirical strategy

The empirical strategy is developed based on the idea of the spatial RDD framework. Our model assumes a similar selection of elite on both observables and unobservables at least across the border of Côte d’Ivoire and Ghana, and that elite has no causal impacts on pest and disease infection in Côte d’Ivoire.

The Akan ethnic group settled precolonial villages in Ghana and Côte d’Ivoire; hence village residents on either side of the border still considered themselves part of “one family” (MacLean, 2009). The two countries’ border regions, as a result, share similar cultures and social customs due to the similarity of ethnic groups. Also, Bubb (2013) showed that irrespective of the divergent de jure state laws in the two countries resulting from persistent colonial institutions (Acemoglu et al., 2001), de facto land tenure property laws are similar at the border region of the
two countries (Bubb, 2013). We, therefore, expect only policy support as the only mechanism driving the elite effect in pests and diseases management, a priori.

The diagram in Figure 1 illustrates the identification strategy where $\beta_1$ captures the regional difference between non-elites. In contrast, $\beta_2$ captures the possible selection bias between elites and non-elites in Côte d'Ivoire, which is equal in Ghana under assumptions of no causal effect of elite in Côte d'Ivoire and similar selection criteria into elite between Ghana and Côte d'Ivoire. The coefficient of interest ($\beta_3$) captures the additional benefit of being elite in Ghana, resulting from the generous agricultural policies in favor of elite farmers relative to non-elite farmers in Ghana. The results are estimated using equation (1) and its variants motivated by spatial RDD with the nearest distance to the border from village $v$ as the forcing variable. The model is specified as:

$$ Y_{ir} = \beta_0 + \beta_1 A_r + \beta_2 D_i + \beta_3 (A_r \cdot D_i) + f(\text{distance to border},) + \gamma X'_{iv} + e_{ir} $$

Where $Y_{ir} = 1$ if farmer’s $i$ cocoa is infected in country $r$, otherwise 0; $A_r = 1$ if Ghana and 0 if Côte d’Ivoire; $D_i = 1$ if a farmer is an elite (measured using leadership roles such as head of a village or clan or member of village assembly), otherwise 0; $f(\text{distance to border},)$ is a regression discontinuity polynomial controlling for smooth function of distance to border from village $v$ and $X'_{iv}$ is a vector of farmer and village covariates.

Also, to check the overall impact of both elites and non-elites in Ghana on pests and diseases, we run the regression in equation (1) without the country-elite interaction term as specified:

$$ Y_{ir} = \beta_0 + \beta_1 A_r + \beta_2 D_i + \gamma X'_{iv} + e_{ir} $$

The coefficient ($\beta_1$) of the Ghana dummy ($A_r$) captures the combined effects of both elites and non-elites in Ghana. The results are reported in Table A1 of the appendix.

(4) Check on validity of assumption

For the validity of our estimates of the causal effect of elite, we checked the assumption that elites ($D_i = 1$) on either side of the border in Ghana and Côte d’Ivoire are similar on average in observable characteristics ($z_i$). We ran the supplemental regression in equation (2) and performed a joint $F$ test on the country-covariate-interactions ($A_r z_i$) to check the selection on observables.

$$ D_i = \alpha_0 + \alpha_1 A_r + \alpha_2 z_i + \alpha_3 (A_r \cdot z_i) + u_{ir} $$

Using the full sample of the data, the result of the joint $F$ test of the country-covariate-interactions was statistically significant at the 5% significance level, $F (22, 1995) = 3.15, p = 0.0000, N = 2,044$, suggesting differences in the selection of elite on observable factors in Ghana and Côte d’Ivoire. Hence, estimating the causal effect of elite using the full sample will be biased.

With a restricted sample using a bandwidth of 100 km distance on either side of the border, the result of the joint $F$ test was insignificant at the 5% significance level, $F (21, 744) = 1.50, p = 0.0686, N = 792$. The selection of elite on observable factors is therefore similar on average within the 100 km distance bandwidth on either side of the border. We, therefore, used the restricted sample to estimate the causal effect of elite on pests and diseases, as the bias due to
selection on observables decreases as the sample converges to the border. We controlled for the observable factors in the estimation models to reduce the selection bias due to observables. However, whether the selection bias due to unobservables can be reduced or not depends on the unverifiable assumption of a similar selection of elites on unobservables.

(5) Testing land rights and policy support

We ran the regressions in equations (3) and (4) to test the hypotheses of better access to policy support (Table 3) and stronger land rights (Table 4) by the elite farmer in Ghana as possible explanations of the causal link between local elite farmer and pest and disease management.

\[ P_{ir} = \beta_0 + \beta_1 A_r + \beta_2 D_i + \beta_3 (A_r \cdot D_i) + e_{ir} \]  

\[ L_{ir} = \beta_0 + \beta_1 A_r + \beta_2 D_i + \beta_3 (A_r \cdot D_i) + e_{ir} \]

Where \( P_{ir} \) measures policy support and \( L_{ir} \) measures land rights of farmer \( i \) in country \( r \).

3. Results and discussions

(1) Effect of elite on pests and diseases

The results of different variants of our model specified in equation (1) in section 2 are reported in Table 2 and Table A1 (see online appendix for Table A1). Column (4) is our preferred specification because it includes a full battery of controls potentially confounding the causal linkage of elitism and pests and diseases management. Also, column (4) is preferred to column (5) which includes farmer covariates and village fixed effects as column (4) contains geographic controls to capture unobservables while many village dummies make column (5) inefficient.

From the results in Table A1 in the appendix, both elite and non-elite farmers in Ghana positively impacted black pod disease infection. Elite and non-elite farmers in Ghana are 16.3 percentage points more likely to have their farms infected with black pod disease relative to those in Côte d’Ivoire (weakly significant at 10% level) (Table A1, Panel A, Column 4) implying more exposure of cocoa farms to black pod disease in Ghana than in Côte d’Ivoire. Also, for CSSVD infection, both social groups in Ghana are 22.3 percentage points more likely to have their farms infected relative to those in Côte d’Ivoire (Table A1, Panel B, Column 4), similarly suggesting the prevalence of the viral disease in Ghana than in Côte d’Ivoire. However, the combined effect of elite and non-elite farmers in Ghana on capsid pest infestation is negative but insignificant (Table A1, Panel C, Column 4), suggesting no differential effect of capsid infestation in both countries facing the two groups.

The causal effect of elite in Ghana on cocoa black pod disease infection is significant in all model specifications in Table 2. From our preferred specification in column (4), where we controlled for village and farmer characteristics, elites in Ghana are 23.3 percentage points less likely to suffer cocoa black pod disease infection due to their social status, as shown in Panel A, Table 2. The causal effect of elite in Ghana on CSSVD (Panel B) and capsid pests (Panel C) is statistically insignificant (Table 2). Given the assumptions that there is a similar selection of elite at least across the border region of Ghana and Côte d’Ivoire and that the elite has no causal impacts on pest and disease infection in Côte d’Ivoire, the insignificant effect between elite and non-elite farmers in Côte d’Ivoire in Table 2, though biased, suggests equal access to agricultural policy in Côte d’Ivoire irrespective of social status in pests and diseases management. Cocoa landholdings covariate is only positively significant in Panel C (Table 2), implying that larger farms are prone to capsid pests which do not explain the causal link between being local elite and pest and disease management.

(2) Government policy support

The probability of elite farmers in Ghana receiving pesticides for free due to their social status was 27.6 percentage points more likely (Table 3, Column 1). Hence, elite farmers in Ghana are more likely to access free pesticide inputs for pest control. In addition, the results showed that elite farmers in Ghana
Table 2. Regression estimates of elite on diseases and pests, bandwidth = 100 km

| Other Controls: | (1) | (2) | (3) | (4) | (5) |
|----------------|-----|-----|-----|-----|-----|
|                 | Ghana |          | Col. (2), with Latitude, Longitude, and Additional Controls<sup>2</sup> | Col. (3) and Additional Controls |
| None           | 0.342*** | 0.214*** | 0.220** |          |
| Distance to Border<sup>1</sup> | (0.036) | (0.055) | (0.078) |          |
| Village Dummies | 0.094 | 0.079 | 0.061 | 0.090 | 0.090 |
| (0.062) | (0.055) | (0.061) | (0.068) | (0.066) | |
| Ghana × Elite | −0.178** | −0.168** | −0.171** | −0.233** | −0.251*** |
| (0.085) | (0.078) | (0.078) | (0.086) | (0.085) | |
| Constant      | 0.184*** | 0.290*** | 0.290*** | 0.633 | 0.395* |
| (0.023) | (0.036) | (0.036) | (0.391) | (0.214) | |
| **R<sup>2</sup>** | 0.084 | 0.090 | 0.006 | 0.118 | 0.036 |

Panel A: Cocoa Black Pod Disease

| Ghana | 0.046 | 0.189*** | 0.267*** |
|-------|-------|----------|----------|
| (0.044) | (0.062) | (0.055) | |
| Elite | 0.059 | 0.065 | 0.059 | 0.062 | 0.053 |
| (0.094) | (0.091) | (0.101) | (0.117) | (0.123) | |
| Ghana × Elite | −0.098 | −0.126 | −0.116 | −0.180 | −0.163 |
| (0.103) | (0.099) | (0.109) | (0.121) | (0.128) | |
| Constant | 0.135*** | 0.084*** | 0.171*** | −0.706** | −0.135 |
| (0.035) | (0.038) | (0.007) | (0.272) | (0.110) | |
| **R<sup>2</sup>** | 0.003 | 0.016 | 0.003 | 0.075 | 0.050 |

Panel B: Cocoa Swollen Shoot Virus Disease

| Ghana | 0.126** | 0.055 | −0.008 |
|-------|---------|-------|-------|
| (0.048) | (0.104) | (0.062) | |
| Elite | 0.034 | 0.022 | 0.009 | 0.018 | 0.025 |
| (0.118) | (0.124) | (0.123) | (0.152) | (0.153) | |
| Ghana × Elite | −0.012 | −0.010 | −0.016 | −0.057 | −0.074 |
| (0.124) | (0.129) | (0.127) | (0.160) | (0.161) | |
| Constant | 0.411*** | 0.492*** | 0.507*** | 0.845** | 0.177 |
| (0.045) | (0.043) | (0.007) | (0.352) | (0.277) | |
| **R<sup>2</sup>** | 0.013 | 0.018 | 0.000 | 0.055 | 0.036 |

Panel C: Cocoa Capsid Pest

| Ghana | 0.126** | 0.055 | −0.008 |
|-------|---------|-------|-------|
| (0.048) | (0.104) | (0.062) | |
| Elite | 0.034 | 0.022 | 0.009 | 0.018 | 0.025 |
| (0.118) | (0.124) | (0.123) | (0.152) | (0.153) | |
| Ghana × Elite | −0.012 | −0.010 | −0.016 | −0.057 | −0.074 |
| (0.124) | (0.129) | (0.127) | (0.160) | (0.161) | |
| Constant | 0.411*** | 0.492*** | 0.507*** | 0.845** | 0.177 |
| (0.045) | (0.043) | (0.007) | (0.352) | (0.277) | |
| **R<sup>2</sup>** | 0.013 | 0.018 | 0.000 | 0.055 | 0.036 |
| N | 877 | 877 | 877 | 792 | 792 |

Data Source: Tyszler et al. (2018)

* p < .10, ** p < .05, *** p < .01

1) The nearest distance to the border between Ghana and Côte d’Ivoire controlled to the third polynomial.
2) "Additional controls": age, age squared, gender, education, years of growing cocoa, household number, literacy, marital status, cocoa land owned (ha), migrant, and head of household.

Robust standard errors clustered at the village level are reported in parentheses.
were 12.4 percentage points more likely to receive cocoa seedlings from the government and 13.6 percentage points more likely to receive liquid fertilizer support due to their social status. The higher social status of elites in Ghana might increase their connections to government extension agents distributing these inputs. The cocoa seedlings which the government raises are hybrids with low susceptibility to black pod disease. Nyadanu et al. (2009) showed the resistance of black pod disease-resistant varieties in both field observation and experiments at the Cocoa Research Institute of Ghana (CRIG).

The findings on the effects of elite on the access to policy support also explain why the elite farmer in Ghana is less likely to be affected by black pod disease but not by CSSVD and capsid. Black pod disease is managed through proper farm management, regular removal of infected pods, proper shade management, and fungicides spray. While CSSVD infected farms require complete eradication of the cocoa trees before planting resistant hybrid varieties, farmers have little control over this disease. Capsid control requires the effective use of pesticides. However, since elite farmers in Ghana were more likely to receive pesticide support resulting from their social status, the insignificant effect of elite in Ghana on capsid pests may be attributed to ineffective or wrong use of these pesticides (Ghana Cocoa Board, 2018).

As MacLean (2009) observed, “Ghanaian villagers viewed village-level authorities as the key decision-makers resolving conflict and promoting development”. This influence and respect might be translated to local elites’ disproportionate access to public resources through building networks with state officials (Wong, 2010). Hence, the position of local elites as intermediaries between state and local communities helps influence the distribution of national public goods (Honig, 2019). Also, elites having political authority in rural communities can translate to resource capture (see Beekman et al., 2013), hence unequal access to public resources between elites and non-elites in Ghana, as found in this study.

(3) Land rights

Our results show that the causal effect of elite in Ghana on land rights captured by the country-elite interaction term is insignificant in all specifications except specification 6 in Table 4. Hence, elite farmers in Ghana leased about 0.19 hectares more land from other landowners due to their social status (Table 4, Column 6), implying weaker land rights in contrast

Table 3. Effect of elite on “government policy support”, bandwidth = 100 km, N = 877

| Inputs or services given1: | (1) | (2) | (3) | (4) | (5) |
|--------------------------|-----|-----|-----|-----|-----|
|                          | Pesticides | Cocoa Seedlings | Fungicides | Liquid Fertilizer | Granular Fertilizer |
| Ghana                    | 0.107*** | 0.107*** | 0.498*** | 0.314*** | 0.357*** |
|                          | (0.092)  | (0.038)  | (0.084)  | (0.035)  | (0.046)  |
| Elite                    | −0.180*  | −0.064*** | −0.021   | −0.005   | −0.005   |
|                          | (0.100)  | (0.023)  | (0.090)  | (0.004)  | (0.004)  |
| Ghana × Elite            | 0.276**  | 0.124**  | 0.163    | 0.136**  | 0.076    |
|                          | (0.115)  | (0.054)  | (0.105)  | (0.056)  | (0.053)  |
| Constant                 | 0.430*** | 0.092*** | 0.159**  | 0.005    | 0.005    |
|                          | (0.075)  | (0.024)  | (0.074)  | (0.004)  | (0.004)  |

Data Source: Tyszler et al. (2018) * p < .10, ** p < .05, *** p < .01
1) Dependent variables are dummies equal to 1 if a farmer receives support from the government; otherwise, 0.
Robust standard errors clustered at the village level are reported in parentheses.
with our hypothesis of stronger land rights of elites in Ghana due to their social status. We surmise that elites in Ghana may be engaged in large-scale cocoa farming that demands extra land larger than what they have tenure rights over.

The causal effect of elite in Ghana on the size of land fallowed is insignificant (Table 4, Column 3). Similarly, in comparing elites and non-elites, as in Goldstein and Udry (2008) study in Ghana, elite farmers fallowed 0.33 (calculated as the sum of the “Elite” and “Ghana × Elite” coefficients) more hectares of land than non-elite farmers but statistically insignificant (Table 4, Column 3). However, this interpretation, given our empirical strategy, is biased. Also, while we use the size of land fallowed, Goldstein and Udry (2008) used the length of fallow duration in Ghana and found that local elite farmers in Ghana had more confidence in maintaining their land rights over a long fallow duration than non-elite farmers, resulting in longer fallow duration leading to higher agricultural output.

Overall, the results indicate little or no causal effect of elite in Ghana on land rights. Therefore, there is no convincing evidence that elite farmers in Ghana invested more in controlling cocoa black pod disease resulting from more secure land rights due to their social status. The results on the insignificant elite causal effect on land rights are consistent with the findings of Bubb (2013) that divergent de jure state laws of Ghana and Côte d’Ivoire had little effect on de facto property rights institutions near the border region.

4. Conclusion

This paper provided quasi-experimental evidence of elite effect in Ghana on black pod disease due to their social status. The study showed that better access to policy might be a more relevant factor in explaining the causal link between being a local elite farmer and pest and disease management than stronger land rights in the case of Ghana and Côte d’Ivoire in West Africa. Therefore, our paper provides new evidence of the possible channel of elite’s causal effect, unlike most related studies that focused on only land rights in the political economy literature in rural areas. This study contributes to the literature on the political economy of elites in rural areas as one of the understudied topics in development economics, taking a look at the policy dimension instead of the conven-
tional wisdom of focusing on only land tenure systems.

Though our findings are only locally valid in the border regions of Ghana and Côte d’Ivoire, similar results are expected in areas farther from the border in Ghana as the Ghanaian government resorts to heavy input support to farmers nationwide, with local elites serving as intermediaries between state officials and local communities. However, we recommend further research in bordering West African countries that share similar ethnicity and norms at the border (e.g., Nigeria and Cameroon), where we suspect similar results under different state policies.

Our findings have two significant policy implications. First, the power structure in rural communities affects the distribution of resources for agricultural and rural development, with those at the top of the traditional political hierarchy as winners and those at the bottom as losers creating inefficiencies in public resource allocation. From equity perspectives, resource distribution should be fair and need-based irrespective of the social status of the potential beneficiaries. Hence, community-based development requires an understanding of power relations (Wong, 2010) to prevent resource capture by elites. Second, agricultural policies supporting farmers in West Africa are beneficial. However, better access to policies by elites can lead to distortions. Hence, while policymakers should promote such policies, they should be well-targeted to avoid distortions by elites in rural areas for agricultural development.

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