Export Taxes and Consumption: A 'Natural Experiment' from Côte d'Ivoire

By Souleymane Soumahoro*

I exploit the emergence of two de facto states in Côte d'Ivoire during the 2002-2007 political crisis to examine the effects of an export tax reduction for cocoa beans on the living standards of farming households. Combining both spatial and temporal variations in exposure to a set of dichotomous tariff policies, I find that farmers in low tariff districts significantly increased their consumption expenditure relative to farmers in high tariff districts. I also provide evidence that the transmission of border prices to local farmers is a relevant mechanism through which the reduction of trade barriers enhances cocoa farmers' living standards.

JEL: D60, F10, O10, Q10.

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* University of Oklahoma, Department of Economics, 308 Cate Center Drive, Room 226 CCD1, Norman, OK 73019-0390, USA, telephone: 1-405-325-2861, e-mail: *soumahoro.souleymane@gmail.com*. I am indebted to Kevin Grier, Robin Grier and Daniel Hicks for their suggestions and comments. I am grateful to the Institut National de la Statistique and the Ministère d'État, Ministère du Plan et du Développement for their permission to use the 2002 and 2008 rounds of the Enquête sur le Niveau de Vie des Ménages (ENV).

I. Introduction

In many developing countries, export taxes are often used by governments as a shield against revenue losses due to declining prices and deteriorating terms of trade in agricultural commodities. However, when export taxes are too high, they can depress farmers' earnings, deter production, and decrease public receipts (McMillan 2001). Because export taxes remain quite popular in many developing countries, they have received a lot of attention in the development literature. For example, it has been suggested that many factors, including pro-urban or interest-group bias (Bates 1981, Widner 1993), dynamic inconsistency (McMillan 2001), and incomplete information (Rodrik 1998) have contributed to the persistence of exorbitant export tax rates in developing countries. As a consequence, many economies in Africa experienced a significant decline in their market shares for primary commodities during the 1980s (McMillan 2001). Yet, there is little if any empirical evidence establishing a causal link between export taxes and farmers' living standards. In this analysis, I fill this gap by providing evidence that reducing export taxes significantly improves farmers' living standards. I also document that one potential mechanism that explains this causal relationship is the price premium associated with export tax incentives.

This article exploits the advent of two *de facto* states in Côte d'Ivoire, the world's largest cocoa supplier, as a 'natural experiment' to examine the causal effect of export tax incentives on cocoa farmers' living standards, as measured by consumption expenditure. In autumn of 2002, an armed conflict split the country into a rebel-held area in the north (hereafter Northern CI) and a government-controlled territory in the south (hereafter Southern CI). This partition had significant implications for the cocoa sector, which alone employs about one-fifth of the twenty millions inhabitants of the country. The acting authorities of Northern CI, where cocoa production represents between 10% and 25% of the average national production (about 1.2 millions metric tons per year), drastically reduced export tax rates levied on cocoa beans.[1] Between 2002 and 2007,

[1] According to Witness (2007), the acting Minister of Economy in the north estimated the cocoa beans production in this area at 130,000 metric tons per year, i.e. 10 percent of the national production, approximately

as exporters in the south faced the pre-partition tax rate of 220 FCFA ($0.44) per kilogram, their counterparts in the north paid between 50 FCFA ($0.10) and 150 FCFA ($0.30) per kilogram. This is equivalent to an average difference of about 75% between the two tax regimes.[2]

Using two waves of the Côte d'Ivoire household living standards surveys (HLSS), the pre and post partition "*Enquête sur le Niveau de Vie des Ménages*" (ENV 2002, ENV 2008), I analyze the effects of export tax relief on cocoa farmers' average consumption expenditure.[3] For this, I rely principally on the difference-in-difference-in-differences (hereafter DDD) identification strategy. By exploiting changes in consumption between cocoa and non-cocoa farmers in the experimental state (Northern CI), the DDD approach accounts for location-specific shocks affecting all farmers equally in this territory. It is also less vulnerable to time trends affecting all individuals across states because it takes into account changes in consumption among cocoa and non-cocoa farmers in the control state (Southern CI). To strengthen this identification strategy, I include a full set of fixed effects including province fixed effects, survey-round-districts fixed effects and survey-round-province fixed effects. To make the treatment and control groups as comparable as possible, I also consider the sample of individual farmers who resided in provinces belonging to the districts split between the two states.[4]

Estimates based on the DDD technique show that living standards of cocoa farmers residing in northern provinces, where exporters faced lower tax rates, improved significantly following the implementation of the tax relief policy. For example, the unconditional specification reported in table 3 suggests that exposure to low export taxes was associated with a relative increase in cocoa producers' average consumption

the annual production of Ecuador, the world's seventh largest cocoa producer. Another estimation, provided by the Director of the fiscal agency of the northern authorities, set cocoa production to 325,000 metric tons per year i.e. 20-25 percent of the national production.

[2]Before the creation in 2004 of the custom and tax organization ('La Centrale') in Northern CI, export taxes were set at $0.10 per kilogram of cocoa beans.

[3]ENV stands for Enquête sur le Niveau de Vie des Ménages which means Household Living Standard Survey (HLSS).

[4]Before the administrative reform of 2011, Côte d'Ivoire was divided into 58 provinces (départements) regrouped into 19 administrative districts (régions). By focusing on the districts split between Northern and Southern CI, I assume that shared socio-economic, cultural and geographic characteristics within districts facilitate comparisons across groups.

expenditure by about 43% between 2002 and 2008. This is equivalent to an increase in consumption from the sample mean of 88,740 FCFA ($177.5) to approximately 126,900 FCFA ($254) over the 2002-2008 period. To ensure that these results are not driven by other tax-independent systematic shocks on consumption, I conduct a series of falsification exercises and robustness checks which support my identification hypotheses. Finally, I show that pass-through of international prices to local producers is a relevant underlying mechanism of this causal link between export taxes and farmers' consumption. In particular, estimates based on the unconditional price equation suggest that farmers residing in low tax areas tended to get an additional 39 FCFA ($0.08) on each kilogram of cocoa beans sold.

The present paper contributes to the debate about the short-run implications of liberalization policies on household well-being. The controversy is particularly fueled by the distributive nature of trade reforms, which often disproportionately reallocate earnings across households. For example, labor-saving productivity advances can temporarily aggravate poverty through their detrimental effects on employment (Winters, McCulloch and McKay 2004). Researchers who have investigated the issue, using different empirical techniques, have come up with mixed results. Among other findings, it has been suggested, for example, that while penalizing the poor in India, trade liberalization also appears to be a source of income disparity in South Asia (Anderson, Cockburn and Martin 2010).[5] Yet, these seemingly unenthusiastic outcomes should be contrasted with the majority of the empirical assessments suggesting that trade liberalization has a strong pro-poor impact [see Winters, McCulloch and McKay (2004) and Anderson, Cockburn and Martin (2010) for a literature review]. Because it builds upon a 'natural experiment' this article extends previous research that investigates a causal link between trade liberalization in agriculture and household living standards in developing countries [see Topalova (2007) and Edmonds and Pavcnik (2006)]. However, the source

[5] As reported in Anderson, Cockburn and Martin (2010), farmers in India benefit from substantial subsidies and other protection policies whose complete removal can severely deteriorate their earnings. These authors also observe that although trade reforms can help shrink the gap between farm and nonfarm earnings, its effect on inequality in agriculture would be less prevalent in South Asia in particular because of the rise of income dispersion among farmers.

of time and cross-sectional variations in exposure to the degree of liberalization makes this analysis plausibly less sensitive to endogenous political and economic processes.

The remainder of this paper is organized as follows. In section II, I review some relevant historical and institutional background on the emergence of two de facto states during the 2002-2007 Ivorian political crisis. Section III elaborates on the data and the identification strategy. Section IV provides details on the empirics of export taxation and consumption and highlights the main results. Finally, I examine theoretically and empirically the price pass-through mechanism in section V and conclude in section VI.

II. Institutional Background

A. Insurgency and the Creation of Two De Facto States

For almost two decades after its independence, Côte d'Ivoire was one of the richest economies in Western Africa and acquired a reputation for political and economic success within the region. Between 1960 and 1980, the country maintained strong and sustained economic growth of more than 7 percent per annum. Over the same period, average GDP per capita was about $1330 (in 2005 US dollars), nearly 6.3 percent of that of the United States. Dependent on primary commodities such as cocoa and coffee (more than 50% of total export in 2000), the Ivorian economy experienced an abrupt and lengthy decline in the 1980s, due in large part to the deterioration of the terms of trade (Espina, Bogetic and Noer 2007). By the time the country devalued its currency in 1993, its ten year average GDP growth had fallen to 0.50 percent.

In December 1999, a coup d'état perpetrated by a former chief-of-staff of the national army plunged the country into a vicious cycle of instability, so common in Sub-Saharan African states. Since then, the political scene of Côte d'Ivoire has been characterized by several episodes of turbulence ranging from street protests to anti-government subversions. The level and the scope of violence reached its peak in September 2002, when an initially unknown armed group simultaneously attacked the main cities of the country including Abidjan the capital city. Although the rebels, who would later be known as

the Patriotic Movement of Côte d'Ivoire (MPCI), failed to overthrow the government, they were able to tighten their grip over the north half of the national territory. The MPCI initially took control of Bouaké in the center and Daloa in the west, the second and third largest cities of the country, respectively. Other important northern localities such as Korhogo, Odienné, and Bouna also fell under rebel control. A counter-offensive by government troops against the rebels allowed them to regain the province of Daloa, but they failed to reconquer the other above-mentioned towns.

In November 2002, two other armed groups, the Movement for Justice and Peace (MJP) and the Ivorian Popular Movement for the Great West (MPIGO), seized control of the western cocoa-producing towns of Man and Danané, respectively. In early December 2002, the loyalist forces dislodged the rebels from the town of Man, but, unable to sustain their position, they finally abandoned the town in the hands of the rebels at the end of the same month. The three movements coalesced in late December 2002 into the *Forces Nouvelles* of Côte d'Ivoire (FNCI) and claimed control over 60% of the country. The Linas-Marcoursis peace agreement, signed in January 2003 by the belligerents and the government, established a buffer zone secured by French and UN peacekeepers, which formalized the cohabitation of two de facto states (Balint-Kurti 2007).

Unlike the rebellions in Liberia and Sierra-Leone, where territorial controls were often associated with 'scorched-earth', 'denial-of-resource' tactics (Innes 2005), or 'no living thing' operations (Gberie 2005), the rebels of the Forces Nouvelles opted for an autonomous governance system.[6] They organized their territory into ten jurisdictions, called 'zones', with each zone being administered by representatives of both the military and executive wings of the rebellion.

From a political economy perspective, existing theories on conflicts, which often emphasize 'greed' over 'grievance' as the main source of armed conflicts in developing countries, may not be sufficient to understand the Ivorian crisis. Africanists such as Marshall-Fratani (2006) and Bah (2010) argue that the Ivorian crisis should be

[6]'No living thing' was a joint-operation by the Sierra Leone army and the Revolutionary United Front (RUF) in 1998-1999, which consisted in killing people and destroying properties indiscriminately.

understood as the consequence of state actors' preferences for non-inclusive policies in a melting pot society. For these authors, the introduction of the concept of Ivoirité in the political discourse and the legal system in the mid-1990s generated social and political discriminations against certain categories of citizens.[7] These communities, in particular the northern ethnic groups and the descendants of the immigrants, felt despoiled from their constitutional rights on citizenship, land ownership, and political participation. This ethno-political grievance is thought to have set the stage for the 2002-2007 quasi-secession in Côte d'Ivoire (Bah 2010).

B. Implications for the Cocoa Trade

In Côte d'Ivoire, the cocoa sector has long been portrayed as the backbone of the national economy. The production of cocoa beans in the country is heavily concentrated in three regional groupings: the south-east (Moyen-Comoé), the center-west (Marahoué, Haut-Sassandra, Fromager and Sud-Bandaman), and the south-west (Dix-Huit Montagnes, Moyen-Cavally and Bas-Sassandra). Together, these districts contribute up to 87 percent of the national cocoa production (Primature 2006). Of the 8 administrative districts subdivided between the two 'states', half were among the major sources of cocoa production. These split districts are of a particular interest for this 'natural experiment' since communities belonging to them plausibly share similar cultural, socio-economic and geographic features. These include the districts of Marahoué, Haut-Sassandra, Dix-Huit Montagnes, Moyen-Cavally, Vallée du Bandama, Lacs, N'Zi Comoé and Zanzan (see Figure 1).

In the midst of the political crisis, net export of cocoa beans from Côte d'Ivoire in 2004-08 exceeded 1.26 million metric tons per year, which represented more than 40 percent of the world share (ICCO, 2010). Although, this is a clear indication that the partition of the country had little effect on its production capability, the distributional effects of the crisis on revenues cannot be ignored. An obvious consequence of the

[7]The concept of Ivoirité was initially introduced by the former president Henri Konan Bédié (1993-1999), to promote the cultural identity of the country. It turns out that the concept was exploited to discriminate against other citizens, especially the northerners and the immigrants.

conflict stems from the emergence of a new state actor, the Forces Nouvelles of Côte d'Ivoire (FNCI), with a fiscal capacity over a territory which makes up between 10 percent and 25 percent of the national cocoa production. In the provinces they controlled, the FNCI managed to maintain an operational bureaucracy which filled up the administrative void created by the absence of the official government. For example, they preserved some of the public infrastructures which facilitated the provision of a minimum service in education and health by local and international non-governmental organizations (Bah 2010, Balint-Kurti 2007).

Moreover, it has been documented that the FNCI introduced an export tax scheme on cocoa beans that was by far more competitive than the one in place in the government-controlled territory (Guesnet, Müller and Schure 2010). Such a policy may have induced significant implications for the revenues of non-institutional players such as cocoa farmers, itinerant traders, and exporters. Did the FNCI adopt a favorable export tax policy in the first place to help potential beneficiaries? As already mentioned, political scientists have put forward a number of reasons to explain the attempted coup that led to the partition of the country in 2002. These include ethno-political grievances such as rights for citizenships and political participation. It is also unlikely that the preferential export tax policy was intended to help the farmers. Instead, the northern authorities made it clear that their goal was to attract more exporters, mobilize more revenues, cut additional funds to Southern CI, and ultimately finance their war effort (Guesnet, Müller and Schure 2010).

Before the partition in 2002, the export tax levied by the government, known as the *droit unique de sortie* (DUS), was 220 FCFA ($0.44) per kilogram of cocoa beans across the country. While this tariff rate remained unchanged in the government-controlled south, the FNCI drastically reduced it to 50 FCFA ($0.1) per kilogram as soon as they consolidated their grip over the north in late 2002 (Witness 2007). Later in 2004, they set up a more resourceful tax and custom organization, known as *La Centrale*, under which export tax on cocoa fluctuated between 125 FCFA ($0.25) and 150 FCFA ($0.30) per kilogram (Balint-Kurti 2007). Because *La Centrale* has sufficient resources

to collect taxes at both the warehouses and borders, it is fair to assume that smuggling was limited.[8] The advantage of the low tariff policy is well summarized by an exporter in the south interviewed by Guesnet, Müller and Schure (2010):

> Last week I saw a lot of cross-border transport. ... We [exporter in the south] pay Francs CFA 333 taxes per kilo.[9] This means that those people who go to Bobo-Dioulasso [Burkina Faso] already benefit from avoiding paying this sum. The interest to do this is big. Even for the European firms, they say 'if I can get this lower price.[10] (p. 46)

Many players are involved in Côte d'Ivoire's cocoa trade, but the most important ones are the farmers, the itinerant buyers and the exporters. Farmers sell their crops to itinerant buyers (*traitants*) either directly or via occasional traders called *pisteurs* at farm-gate price. The *traitants* sell in turn their products to exporters, who in turn supply the international market (Kireyev 2010). This paper is particularly concerned about the causal effect of such a liberalization policy on smallholder cocoa farmers in Côte d'Ivoire. Looking at this first layer of the cocoa supply chain is attractive for several reasons. First, it offers an opportunity to assess the effectiveness of price transmission from exporters to farmers, despite the complexity of the supply chain. Second, farm households' expenditures appear also to be a good proxy for earnings in rural areas since, as pointed by Winters, McCulloch and McKay (2004), farmers tend to spend their additional revenues on goods and services provided by other poor households. Finally, it enables me to explore how the reduction of export restrictions affects specific expenditure categories such as investments in education and health or the satisfaction of basic needs such as food and clothing.

[8] According to Witness (2007), "*La Centrale* has about 150 staff, including civilians and military, deployed at the zones' borders, in offices in major towns and at checkpoints. In each of 10 FN sub-zones, it also has one representative, a 'régisseur' who works with the tax officials."

[9] This estimate of 333 FCFA ($0.67) includes, in addition to the main export tax (DUS) of 220 FCFA ($0.44), other fiscal and quasi-fiscal levies such as the registration tax as well as fees collected by the regulatory institutions.

[10] According to Witness (2007), most of the cocoa beans from Northern CI was first transported to Bobo-Dioulasso, in Burkina Faso, before being exported outside Africa via the port of Lomé in Togo. Exporters used this route because it allows them to avoid double taxation. In fact, taking advantage of the free trade agreement between the members of the West African Economic and Monetary Union, exporters who paid the export taxes in Côte d'Ivoire could not be subject to the same taxes in Burkina Faso and Togo, also members of the Union.

III. Data and Methodology

A. *Côte d'Ivoire Living Standards Survey Data*

I use the 2002 and 2008 Côte d'Ivoire HLSS, known as the *Enquête sur le Niveau de Vie des Ménages* (ENV), compiled by the *Institut National de la Statistique* (INS). Interestingly, the 2002 and the 2008 rounds of the ENV were conducted three months before the inception of the conflict and a year after the dismantlement of the demarcation line, respectively. The ENV (2002) and ENV (2008) provide a rich set of information on living standards, demographics, and location for 10,800 and 12,600 households, respectively. There are 4,891 individual cocoa farmers in the combined surveys. Summary statistics for this sample indicate that the average per capita total consumption expenditure, in constant national currency, was about 88,740 FCFA or approximately 178 in US dollars (see Column 3 Panel A of Table 1). More than 70% of this expenditure was devoted to the basic needs such as food and clothing for resident and non-resident (transfers for example) household members, 17% of it went to investment in education and health, and the remainder was allocated to other types of spending including leisure and transportation.

Table 1 also provides information on the temporal and spatial distribution of cocoa farmers' per capita expenditure (Columns 4-9, Panel A). In terms of total expenditure, cocoa farmers in Southern CI with 92,830 FCFA ($186) did relatively better than their peers in Northern CI, who spent on average 65,530 FCFA ($131). Nonetheless, looking at changes in expenditure across surveys shows that cocoa farmers in Northern CI significantly increased their per capita expenditure. In particular, while cocoa farmers in Southern CI increased their consumption expenditure by approximately 20% between 2002 and 2008, consumption among their Northern counterparts went up by about 126% over the 5 year period. Some important characteristics of the household such as the age, gender, marital status of its head, its size and whether it belongs to a rural community are on average less likely to reflect these large differences in the living standards implied by the evolution of per capita expenditure. In fact, both the cocoa farmers in Southern

and Northern CI were similar along these dimensions. For example, these farmers were essentially male (94%), married (85-88%), rural dwellers (87-93%), and on average 46 years old. As for the ethnic and religious affiliations as well as the degree of literacy, there was a great deal of heterogeneity among cocoa farmers in Southern and Northern CI. Cocoa farmers in Southern CI were more literate than those in Northern CI (49% vs. 36%); they were largely members of the Akan ethnic group (39% vs. 7%) and had fewer Mande Southern ethnicities than cocoa farmers in Northern CI (7% vs. 41%). Despite these differences or similarities at the mean, a robust investigation requires that this inquiry takes these characteristics into account, as control variables, in a more elaborate empirical exercise.

As already discussed, a major implication of the 2002-2007 armed conflict was the reallocation of communities - including the lands farmers used to grow their crops - to two separate territories in the same country. Moreover, the acting authorities in Northern CI (the FNCI) provided an export tax incentive in their territory that was more profitable for cocoa exporters than the tariff scheme in place in Southern CI. Raw data about farm-gate prices paid to cocoa producers by intermediary traders seem to indicate some important patterns of incentive transmission in favor of Northern farmers. As shown in Panel A of Table 1, farm-gate prices (deflated by the domestic consumer price index) decreased by about 93 FCFA in Southern CI between 2002 and 2008, which was approximately 70% higher than the fall in prices in Northern CI.

As pointed out by Benjamin and Deaton (1993), mean observations are less appealing than nonparametric distribution approaches when it comes to analyzing households' consumption in the field of agriculture. Following these authors, I compare in figure 2 the cross-state distribution of the log per capita consumption expenditure for cocoa farmers (top panel) and non-cocoa farmers (lower panel). Two important results stem from these distributions. First, as the pre and post-partition gaps in average consumption across states remained stable for non-cocoa farmers (lower panel), cocoa farmers in Northern CI significantly converged towards the consumption levels of their southern counterparts between the two periods. Figure 3 provides a much more intuitive, albeit

simpler, visual representation of this convergence in consumption. The improvement in living standards, as measured by log per capita consumption expenditure, for the northerners relative to the southerners was approximately 0.411. Second, the kernel density displayed in figure 2 reveals that the preferential export tax policy also had important distributional effects. The effect is particularly more pronounced in the lower tail of the distribution, suggesting that the poorest farmers in Northern CI benefited relatively more from the tax reduction. In the following sections, I rely on a set of robust parametric and non-parametric econometric techniques to examine the causal effect on consumption of the liberalization policy implemented in Northern CI between 2002 and 2007.

B. Identification

In this study, I exploit two plausible sources of exogenous variations in an individual farmer's exposure to different export tax regimes: a time variation and a cross-sectional variation. Before the division of Côte d'Ivoire into two administrative and political blocks, a uniform cocoa tariff system prevailed across all the 58 *départements* - or provinces - of the country. It is only after the apparition of the *Forces Nouvelles* in September 2002, along with their military and political capabilities to conquer and administer a significant portion of the national territory, that dichotomous export tax policies surfaced. While in the government-controlled south, the export tax on cocoa was maintained at 220 FCFA ($0.44) per kilogram, tariff rates fluctuated between 50 FCFA ($0.10) and 150 FCFA ($0.30) per kilogram in the rebel-held north (Witness 2007).

To identify the effects on cocoa farmers of the preferential export tax policy implemented in Northern CI, I employ principally the DDD approach. This empirical strategy is meant to control for any confounding factors affecting cocoa farmers' consumption patterns in Northern CI that are not caused, albeit correlated with, the export tax policy. First, exploiting the time and cross-sectional nature of the policy, I include both the year and state effects to absorb time trends and state-specific differences in consump-

tion. Then, to immune the impact of the policy on consumption against state-specific shocks that coincided with its implementation in the experimental state, I also include state-by-year effects. In other words, I contrast changes in consumption expenditure between the treated group (cocoa farmers) and a control group (non-cocoa farmers) in the treatment state (Northern CI), with changes in consumption between a pair of untreated groups (cocoa farmers vs. non-cocoa farmers) in the control state (Southern CI).

To refine the identification of the impact of the export tax policy on consumption, I also use a sub-sample of communities that resided in districts located on both sides of the demarcation line separating the two states. Because district creation often obeys certain socio-economic, cultural and geographic coherences, treated and control groups from these split districts would have the advantage of being more comparable. Here, I exploit the idea that, beyond shared observable and unobservables characteristics, one fundamental difference between farmers residing in these split districts was their exposure to different export tax policies.

To sum up, the percentage difference in export tax between the low and high tariff areas during the crisis was on average about 75%. Using a repeated cross-section, I aim at quantifying the effects of the tariff reduction in the experimental territory (Northern CI) on the living standards of the treated group (cocoa farmers). For two main reasons, I hypothesize that it was unlikely that farmers' exposure to low tariff would have been influenced by either their observed and unobserved characteristics. First, before the recognition of the state borders by the Linas-Marcoussis peace agreement, there were several occurrences of territorial shifts between the belligerents.[11] The cases of Man and Daloa, described in section II.A, are two good examples. Second, the preferential export tax policy introduced in Northern CI was not intended to help the farmers. Instead, it was motivated by the Forces Nouvelles' own self-interest for tax resources (Guesnet, Müller and Schure 2010). This argument can be challenged by conjectures suggesting

[11] On January 26th 2003 the protagonists of the Ivorian Crisis signed a peace deal under the supervision of the international community, including France and the United Nations. A buffer zone, known as *la zone de confiance*, which defined the demarcation between the two territories was formed along the frontline and placed under the surveillance of the UN and French soldiers.

that the armed conflict in Côte d'Ivoire was a revolution of the northerners (Mande Northern and Voltaique) against the southerners (Akan, Krou and Mande Southern). But, looking at the ethnic composition of cocoa farmers in Northern CI weakens the underlying hypothesis suggesting that the policy could have been introduced for ethnic favoritism. In fact, it is clear from the summary statistics (Panel C, Column 9) that southern ethnicities such as the Mandé Southern (41%) and the Krou (27%) are the dominant groups in cocoa farming in Northern CI.

IV. Export Taxes and Consumption: The Causal Link

A. Preliminary Evidence

In table 2, I report the standard difference-in-difference (DD) estimation of the impact of export tax reduction on cocoa farmers' consumption expenditure. In panels A and B, I compare changes in the logarithm of consumption expenditure for cocoa farmers in Northern CI (treatment state) to that for cocoa farmers in Southern CI (control state). More specifically, as panel A examines changes in consumption using the sample of cocoa farmers from all districts, panel B focuses essentially on the subsample of cocoa farmers from the split districts in which individuals farmers are relatively more comparable than farmers from all districts. To test the validity of my identification hypothesis, I finally compare changes in consumption expenditure within a placebo subsample of cocoa farmers who were not exposed to the new export tax policy (panel C).

The results from both panel A and B are quite similar statistically and qualitatively. On the one hand, there was a significant increase in per capita consumption expenditure in both the treatment and control states. For example, in the subsample of split districts, the within-state logarithm of per capita consumption expenditure increased by about 0.784 in Northern CI, and by about 0.378 in Southern CI. On the other hand, per capita consumption expenditure remained relatively higher in the non-experimental state (Southern CI) than the experimental state (Northern CI). In particular, before the implementation of the new export tax policy (pre-partition period), the logarithm

of consumption expenditure of cocoa farmers in the split districts of Northern CI was 0.434 lower than that of their peers in Southern CI. But, this difference in consumption expenditure dropped to 0.028 after the new export tax policy was implemented in Northern CI. Overall, these results suggest that exposure to low export taxes not only improved significantly cocoa farmers' living standards, but it also contributed to shrink the pre-partition consumption gap that existed between cocoa farmers across states.

Estimates of the effects of the export tax reduction are displayed in row 4 of panels A and B. Thus, for the split districts (panel B), the DD estimate of the impact of the new export tax policy on the logarithm of consumption expenditures is about 0.406. It is positive and highly statistically significant. Economically, it suggests that there was approximatively a 50 percent relative increase in the consumption expenditure of cocoa farmers in Northern CI. To test whether the then identified effect of the policy is vulnerable to different time trends across territories, I conduct a falsification exercise using a pool of cocoa farmers drawn from the control state (Southern CI).

In panel C, I present the results of this placebo test. I compare, in particular, changes in the logarithm of per capita consumption expenditure of cocoa farmers in Southern CI selected from the sample of split and non-split districts. The difference-in-differences estimate for these two untreated groups of cocoa farmers is not significantly different from 0 (row 4 of panel C). This suggests that the effect of the policy on cocoa farmers' living standards, is less likely to suffer from an identification issue.

To complement the results from the DD estimation in table 2, I present in table 3 the DDD estimates of the impact of export taxes on consumption. In panel A, I contrast relative changes in consumption among a pair of treated and untreated cocoa farmers, which belong to Northern and Southern CI, respectively. Before the partition, cocoa farmers in Northern CI lagged considerably, in terms of consumption, behind their peers from Southern CI. But, after the partition the consumption gap (in logarithm terms) drops from 0.561 to 0.150. Thus, this result suggests that the fall in export taxes improved relative consumption for cocoa farmers in Northern CI by approximately 50%. This is by construction equivalent to the DD estimation previously obtained in

panel A of table 2.

One limitation of the DD estimate obtained in both table 2 and panel A of table 3 is its vulnerability to heterogenous time trends across states. For example, resources reallocation following the partition could have triggered disproportionate tax collection in Southern CI to the detriment of cocoa farmers. To test this hypothesis of non-parallel time trends across states, I compare in panel B of table 3 relative changes in consumption using a pair of untreated groups from each state. The DD estimation from this control group suggests that non-cocoa farmers in Northern CI experienced a relative increase in consumption of about 5.23%. This is clear indication that taking into account state-specific consumption shocks is appealing for identifying the effect of the export tax relief on farmers' living standards.

Overall, the DDD estimation obtained from subtracting the DD in panel B from the DD in panel A suggests that the fall in export taxes was accompanied by a relatively significant increase in consumption for cocoa farmers in Northern CI. The magnitude of this relative gain in well-being was about 43%. In what follows, I exploit the availability of a rich set of information from the ENV survey, at both the household and individual levels, to extend this analysis to a regression framework. Such a strategy has the advantage of taking into account other measurable individual-level characteristics and/or unobservables province and district specific factors that may influence rural households' living standards.

B. Regression DDD Specification

To further examine the causal link between export taxes on cocoa beans and individual cocoa producer's living standards, I estimate variants of the following regression à la Gruber (1994), where the response variable is log per capita consumption expenditure in constant domestic currency of farmer i from household h located in province p

at time t:

$$
\begin{aligned}
Y_{ihpt} = \alpha + \lambda_1 Lib_i + \lambda_2 Post_t + \lambda_3 Cocoa_i + \gamma_1(Lib_i \cdot Post_t) + \gamma_2(Cocoa_i \cdot Post_t) \\
+\gamma_3(Lib_i \cdot Cocoa_i) + \delta(Lib_i \cdot Cocoa_i \cdot Post_t) + X_i^{'}\beta_x + Z_{ht}^{'}\beta_z + \beta_p + \varepsilon_{ihpt}.
\end{aligned} \tag{1}
$$

Unlike the standard approaches presented in tables 2 and 3, this specification offers more flexibility in terms of integrating additional covariates that may affect the farmer's living standard, as measured by his consumption expenditure. The terms α and β_p are the constant and the province fixed effects, respectively. The province fixed effects control for hard-to-account-for local institutional and cultural features as well as time-invariant geographic factors that may affect the farmer's earnings and expenditures. The vector $X_i^{'}$ summarizes the individual farmer controls, such as his ethnic and religious affiliations, while the vector $Z_{ht}^{'}$ incorporates controls for both the household itself and the characteristics of the household's head. Controls at the household level include the size of the household, and dummies for rural residency and cement tile floor. For the head of the household, I include his age and dummies for gender, marital status, literacy (whether he can read and/or write) and ownership of mobile phone.

Lib_i, $Post_t$ and $Cocoa_i$ are dummy variables for the liberalization-friendly state, the post-partition time period, and an identifier for individual cocoa farmers, respectively. Including these dummies separately in equation 1 aims at disentangling their exclusive effects on consumption. These include the experimental state fixed effects (λ_1), the post-partition variation in consumption (λ_2), and consumption patterns specific to cocoa farmers (λ_3). Consistent with the DDD tradition, the model in equation 1 also takes into account the interaction effects of these indicator variables. In particular, while γ_1, the coefficient of the interaction term $Lib_i \cdot Post_t$, absorbs time-specific changes in consumption in the experimental state, the coefficient γ_2 on the interaction term $Cocoa_i \cdot Post_t$ aims at controlling for the overall time-variation in cocoa farmers' consumption. Finally, γ_3, the coefficient of the term $Lib_i \cdot Cocoa_i$ captures time-invariant consumption patterns specific to cocoa farmers in the experimental state (Northern CI).

The measure of interest in this DDD empirical exercise is the coefficient δ of the triple interaction term $Lib_i \cdot Cocoa_i \cdot Post_t$. This coefficient captures the magnitude of the causal effect of export tax reduction on cocoa farmers' living standards, as measured by per capita consumption expenditure. It bears such an economic interpretation because it compares cross-states differences in consumption between cocoa farmers and other farmers before and after the implementation of the preferential export tax policy. To close the presentation of the model in equation 1, I define ε_{ihpt} as an idiosyncratic error term. In all specifications, I follow Cameron, Gelbach and Miller (2011) and report cluster-robust standard errors at the household and census block levels. This approach accounts for arbitrary correlation across individual-level observations within both the households and census blocks.

C. Main Findings

In table 4, I report estimates of variant specifications of equation 1. The DDD estimates using a specification unconditional to household controls and to any disaggregated location (district and province) fixed effects are displayed in column 1. Column 2 presents the results including individual-level and household-level controls, but without controlling for district-level and province-level fixed effects. In columns 3-5, I estimate the effect of export taxes on consumption using a variety of estimation strategies robust to the inclusion of diverse fixed effects. These include province fixed effects (column 3), survey-round-district fixed effects (column 4) and survey-round-province-fixed effects (column 5). Both the survey-round district and province fixed effects have the advantage to compare cocoa farmers to other farmers within the same location (district or province) pre and post partition across states. The DDD estimates are positive and statistically significant across specifications. For example, the results based on the specification with individual-level, household-level and province fixed effects (column 3) suggest that exposure to low export taxes was accompanied with an increase in relative consumption of about 61%. Comparing the beneficiaries of the tax relief to others within the same location, the magnitude of the impact of export taxes on consumption

varies between 28% (column 4) and 23% (column 5).

In table 5, I examine potential heterogeneity, induced by the export tax relief, across categories of consumption spending. More specifically, I estimate the effects of the policy on investment in education and health, inter-household transfers, basics needs such as food and clothing, and other types of spending including leisure, transportation, etc. In addition to the full sample based on all districts (panel A), I also report results using the subsample of districts split between the two de facto states (panel B). In each specification from column 1 to column 6, I control for both the household controls (individual-level and household-level) and the province fixed effects. Although column 1 of panel A has been previously discussed (see column 3 of table 4), I report it to contrast its results from the estimates based on split districts (column 1 of panel B). Except for investment in education, estimates based on the full sample are positive and significant for the other categories of spending. As for the split districts, the results are qualitatively similar to the full sample case in panel A, but only the coefficients on total expenditure, food and other types of spending are statistically significant. Estimates based on all districts (panel A in table 5) suggest that export tax relief induced an increase in log per capita expenditure for health (0.369), transfer (0.528), clothing (0.304), food (0.440) and other types of expenditure such as leisure and transportation (0.450). As for investment in education, its coefficient is negative (-0.235) but statistically insignificant.[12]

So far, the results from the parametric empirical analysis suggest that the implementation of a preferential export tax treatment in Northern CI, between 2002 and 2007, turned out to be revenue-enhancing for cocoa farmers. Where export tax reduction occurred, the mean of the overall consumption spending went up. This improvement in consumption was associated with higher spending in health, nutrition, clothing, inter-

[12]The apparent negative but statistically insignificant effect of export tax alleviation on investment in education can be explained by several factors. First, as pointed out by Sany (2010), more than 50% of school-aged children were out of school between 2002 and 2004 in Northern CI. Second, local and international NGOs, with the support of UNICEF, filled the void left by the official government in the educational system, and often provided cost-saving incentives to parents in order to encourage enrollment. Finally, it could be the case that favorable conditions in the cocoa sector, including the pecuniary opportunities they offer, pull children away from schools towards cocoa fields (Nkamleu and Kielland 2006).

household transfers, etc. The gain in living standards for cocoa farmers is consistent with the nonparametric results in figure 2. Moreover, an attentive scrutiny of the kernel density in the upper panel of figure 2 reveals that the export tax policy also had important distributional effects. The effect seems to be more pronounced in the lower tail of the distribution, suggesting that poorest farmers in Northern CI benefited relatively more from the tax reduction than the wealthiest farmers. In the next subsection, I explore this potential heterogeneity in the impact of the export tax policy on consumption.

D. Distributional Effects

An important aspect of the expenditure distribution in figure 2 (top panel), is that the lower-tail inequality between cocoa farmers across states significantly decreased over time. To closely investigate potential distributional effects of the export tax reduction, that may not be captured by mean estimators, I rely on a quantile estimation strategy. More specifically, I estimate the effect of the policy on the median and both the lower and upper quartiles. Median estimators are thought to be more well-suited than mean estimators in dealing with outliers. But, looking specifically at upper and lower expenditure quantiles provides a good assessment on how the liberalization policy under investigation affects inequality across farm households.

In columns 1-3 of table 6, I report the coefficients from the quantile regression estimation for the first ($\tau = 0.25$), second ($\tau = 0.50$) and third ($\tau = 0.75$) quartiles of expenditure. To contrast the quantile estimates from the previous results, I report in column 4 the coefficients from the least squares estimation. In all specifications, I control for all the relevant individual-level and household-level characteristics previously defined as well as for province fixed effects. Overall, the results suggest that reducing export taxes on cocoa beans had positive and statistically significant effects on expenditure at all quartiles of distribution examined. But, more specifically, the effects of the policy on conditional distributions vary in magnitude across expenditure groups. The overall tendency, for both the full sample and the subsample of split districts, is

that the impact of export tax on consumption decreases as the quantiles increase. For example, both the results based on all districts and the split districts indicate that the first quartile coefficients are significantly higher than the third quartile coefficients. As for the median coefficients, while being slightly lower than the first quartile coefficients, they are similar to the OLS coefficients. These results suggest that poor farm households benefited relatively more from the export tax reduction than households at the upper-tail of the income distribution. Also noteworthy is the fact while the coefficient of the third quartile is statistically significant at 1% in the full sample case, it is insignificantly different from 0 in the case of the split regions.

E. Robustness Checks

In addition to the placebo test presented in panel C of table 2, I reinvestigate the validity of my identification strategy by conducting a series of falsification exercises. In particular, I estimate the following equation using different samples of individuals that were not directly exposed to the favorable export tax policy:

$$(2) \qquad Y_{ihpt} = \alpha + \beta_p + \gamma Lib_i + \lambda Post_t + \delta(Lib_i \cdot Post_t) + X_i^{'}\beta_x + Z_{ht}^{'}\beta_z + \varepsilon_{ihpt}.$$

Here, the outcome variable is log per capita consumption expenditure in constant domestic currency for a given individual i from household h located in province p at time t. The idea is to check, for other farmers (especially non-cocoa farmers), whether being a resident of the experimental state (Northern CI) was associated with an increase in the living standards. If the relationship between consumption expenditure for non-cocoa producers and residency in Northern CI appears to be insignificantly different from zero, then this would suggest that my identification strategy is valid.

Table 7 presents the results of the various falsification tests. Equation 2 is estimated using respectively all farmers (including cocoa farmers) and subsample of farmers without cocoa farmers. As before, the results using all districts are distinguished from the results based on the split districts. I also include household controls and province fixed

effects in all specifications. In columns 1-2, I compare the overall change in the logarithm of per capita consumption expenditure for the residents of Northern CI to that of the residents of Southern CI, including the cocoa farmers from both states. In columns 3-4, I reexamine the same difference-in-differences, with the exception that cocoa farmers are excluded. In all specifications, the estimated coefficients are all not significantly different from zero. This suggests that residency in Northern CI was not itself a source of income gain for both farmers. In other words, my identification strategy cannot be rejected by these placebo tests.

Perhaps the identified improvement in cocoa farmers' living standards in Northern CI, documented in previous sections, is explained by alternative factors unrelated to the liberalization policy. These include for example differences in production, productivity, size of cropland, availability of labor and time allocation to farming. To examine this hypothesis, I reestimate equation 1 using these potential factors as outcomes variables. The rationale here is to shed light on any probable comparative advantage that goes with cocoa farming in Northern CI beyond the fact that this state benefited from a liberalization policy.

In panel A of table 8, estimates from the DDD strategy suggest that farmers in Northern CI did not devote more time to farming relatively to their counterparts in Southern CI (column 1). Moreover, I find no evidence that neither production (column 2) nor productivity (column 3) of cocoa beans in Northern CI were relatively higher. In table 8, farmers were asked whether they had hired more labor (panel B) and had increased the size of their cropland (panel C) between the last harvest and the date of the interview. For each question, the motivations of their choice should be specified. In case they answered in the affirmative, the motivations varied from "availability of labor" to "increase in farm-gate prices". As shown in column 1 of panel B and C, cocoa farmers in Northern CI reported that had hired more labor and had increased the size of their cropland in comparison to cocoa farmers in Southern CI. Interestingly, they also reported that relative favorable farm-gate prices justified these outcomes (column

3 in panel B and C)[13]. In the next section, I investigate one relevant mechanism, price pass-through, underlying the association between the alleviation of export restrictions and the living standards of agricultural households.

V. Mechanism: Price Pass-Through

A. A Basic Model

In this subsection, I introduce a simple theoretical framework that sheds light on the welfare implications of trade reforms in an underdeveloped agricultural economy. It complements a large body of research that has identified the transmission of border prices to local farmers as an important mechanism through which trade liberalization enhances social welfare (see for example Porto (2006), and Winters, McCulloch and McKay (2004)). Conceptually, the most closely related model is Casaburi and Reed (2013), who draw on Chaudhuri and Banerjee (2004). Unlike these authors, who capture trade reforms by export or credit subsidies, I consider trade liberalization through the lens of export tax incentives.

I consider a large economy with significant market power in the production of an agricultural commodity. The economy is divided into two separate oligopsonistic markets $m = \{n, s\}$, populated each with a large number of farmers F_m and a small number of homogeneous traders T_m. Although land and crop yield are assumed to be equally distributed across markets, they vary across farmers within each market. An individual farmer i receives the average market price p^m per unit of output y_i^m sold to a trader operating in market m. The trader in turn sells the product in the international market at per unit wholesale price p^w. Since each trader is assumed to exert a degree of monopsony power, the per unit price to which the commodity is purchased from farmers is

[13]It is worth noting that it takes at least five years for a cocoa tree to produce cocoa beans. Therefore, increasing the size of cropland between two harvest seasons should not necessarily translate into more production. This suggests that the results regarding no significant difference in production (panel A) and increase in the size of cropland (panel C) are not contradictory.

given by:

$$p^m = p^w(1 - \tau^m) - f^m, \tag{3}$$

where τ^m and f^m are the market-specific export tax rate levied by the government and transactions costs, respectively. The latter includes transport costs and other charges incurred by the trader. In this model, the degree of trade liberalization prevailing in the economy is captured by the degree of export tax incentive. In particular, market n is said to be more liberalized than market s if $\tau^n < \tau^s$.

Whenever a transaction occurs in market m, the utility enjoyed by farmer i who sells his produce at the average unitary price p^m can be written as:

$$u_i^m = [p^w(1 - \tau^m) - f^m]y_i^m. \tag{4}$$

From equation (4), I write the average welfare for farmers transacting in market m as:

$$W^m = \int_{y_L}^{y_H} u^m f(y)\, dy, \tag{5}$$

where $f(y)$ denotes the probability density function (pdf) of the land output y with support over the interval $[y_L, y_H]$.

Combining equations (4) and (5), I can derive the difference in changes in average welfare across markets in response to a change in international price p^w. Under the assumption of perfectly inelastic supply, this difference is given by:

$$\frac{dW^s}{dp^w} - \frac{dW^n}{dp^w} = E[y](\tau^n - \tau^s). \tag{6}$$

According to equation (6), in response to an increase in international price, farmers transacting in low export tax environments tend to experience a more rapid increase in average welfare. This simple theoretical intuition is consistent with the empirical

findings I have documented so far in the previous sections. If, for example, τ^n and τ^s denote respectively the export tax rates in Northern CI and Southern CI with $\tau^n < \tau^s$, then equation (6) would suggest that cocoa farmers in Northern CI are more likely to be better off than their Southern CI's counterparts following a positive price shock in the international market.

One potential channel the literature has identified as an important factor through which favorable international market conditions can translate into increasing welfare is the price pass-through mechanism. To see this, I compare changes in prices across markets following a change in international prices. From equation (3), I can write:

$$\frac{dp^s}{dp^w} - \frac{dp^n}{dp^w} = \tau^n - \tau^s. \tag{7}$$

Equation (7) not only suggests that price pass-through is more pronounced in low export tax environments, but it also implies that the transmission of international prices to local farmers is an important mechanism through which trade liberalization improves living standards. This intuition becomes obvious when I combine equations (6) and (7) to obtain:

$$\frac{dW^s}{dp^w} - \frac{dW^n}{dp^w} = E[y](\frac{dp^s}{dp^w} - \frac{dp^n}{dp^w}). \tag{8}$$

In the next subsection, I investigate empirically the hypothesis that exposure to low export tax was accompanied by an increase in farm-gate prices received by farmers.

B. Empirical Evidence

To formally investigate the price mechanism predicted in the basic model above, I start by comparing in table 9 farm-gate prices received by local farmers across states. As before, I consider both the sample of cocoa farmers in all districts (panel A) and the subsample of cocoa farmers in the split districts (panel B). Overall the results indicate in both cases a fall in per kilogram farm-gate prices over time. Nonetheless,

farmers exposed to low export tax experienced a relatively less severe decrease in prices compared to farmers residing in high export tax jurisdictions. The estimates from the difference-in-differences suggest that a cocoa farmer in Northern CI (treatment state) received on average between 38.93 FCFA (all districts) and 39.73 FCFA (split districts) more for each kilogram of cocoa sold. Again the placebo in panel C of table 9 supports the validity of the identification strategy.

To complement the inquiry on the price pass-through mechanism, I also estimate the following equation:

$$Price_{ihpt} = c + \sigma_p + \theta_0 Lib_i + \theta_1 Post_t + \theta_2 (Lib_i \cdot Post_t) + W_i^{'} \sigma_x + \varepsilon_{ihpt}, \tag{9}$$

where $Price_{ihpt}$ is the price received by cocoa farmer i from household h located in province p at time t. While the terms Lib_i, $Post_t$ and $Lib_i \cdot Post_t$ are defined as before, the terms c, σ_p and ε_{ihpt} represent the constant, the province fixed effects and the error term, respectively. As in the previous difference-in-differences regressions, standard errors are clustered at the household and census block levels. The vector $W_i^{'}$ includes a set of household level control variables such as the age and gender of the head as well as indicators for a rural area, literacy and ownership of a mobile phone, and cement or tile floor.

Table 10 presents estimates from equation (9). In columns 1-3 and 4-6, I report the results using the sample for all districts and the subsample for the split districts. Consistent with the results from table 9, exposure to low export tax was accompanied by a significant increase in farm-gate prices received by cocoa farmers in Northern CI. For example, taking into account both the household characteristics and the provinces fixed effects (columns 3 and 6), the additional per kilogram farm-gate prices received by northern cocoa farmers varied between 53 FCFA (all districts sample) and 64 FCFA (split districts subsample). The latter is equivalent to approximately 13% of the pooled sample average farm-gate price. This result suggests that the transmission of border prices to local farmers is a relevant mechanism through which export tax incentives

improve the living standards of farm households.

VI. Conclusion

A large literature has been devoted to the poverty-reducing effects of trade liberalization policies [see Winters, McCulloch and McKay (2004)]. Despite their methodological rigor, critics have often raised some skepticism about the causal implications of previous studies. An important issue is the non-randomness of liberalization policies, which are thought to be the echoes of the influential activities of various interest groups (Mayer 1984, Trefler 1993). For example, it has been suggested that farmers in poor countries who are often less educated, less organized and geographically scattered have a relatively weaker lobbying power on trade issues than their counterparts in developed nations (Anderson, Hayami and George 1986, Olson 1985).

In this analysis, I exploit a rare opportunity of a 'natural experiment', characterized by a temporary coexistence of two de facto 'states' in Côte d'Ivoire, to examine the causal link between the reduction of trade barriers and farm household consumption. Using both time and cross-sectional variations in export taxes, I show that exposure to low export taxes on cocoa beans increased the living standards of cocoa farmers by a significant margin. I also provide evidence that the transmission of international prices to local producers is one potential mechanism through which export tax incentives contribute to improved living standards among farm households. These results suggest that exorbitant export taxes have detrimental effects on farmers' earnings and living standards. Thus, non-optimal export taxation can deter production and ultimately be self-defeating for developing countries, including the ones with a significant market share in an agricultural commodity (McMillan 2001).

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Table 1—Summary Statistics For Cocoa Farmers.

	Full Sample			Southern CI			Northern CI		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
	2002	2008	Pooled	2002	2008	Pooled	2002	2008	Pooled
Panel A: Outcomes									
Education	4.72	14.68	8.78	4.86	14.98	9.19	4.04	12.21	6.47
	(13.6)	(23.4)	(18.89)	(14.5)	(23.67)	(19.62)	(8.29)	(20.98)	(13.87)
Health	6.96	6.12	6.62	7.7	6.05	6.99	3.58	6.65	4.49
	(33.26)	(16.24)	(27.61)	(36.43)	(13.18)	(28.88)	(8.53)	(31.71)	(18.72)
Transfer	21.99	34.21	26.98	24.35	34.1	28.52	11.1	35.07	18.22
	(54.97)	(79.77)	(66.49)	(58.9)	(80.56)	(69.16)	(28.57)	(73.22)	(47.74)
Clothing	24.43	29.07	26.32	26.31	28.47	27.24	15.75	33.90	21.14
	(32.92)	(32.28)	(32.73)	(35.15)	(31.11)	(33.49)	(17.11)	(40.34)	(27.49)
Food	10.50	9.22	9.98	11.23	9.24	10.38	7.11	9.10	7.70
	(11.15)	(9.33)	(10.46)	(11.67)	(9.37)	(10.79)	(7.46)	(9.01)	(7.99)
Other	10.03	10.09	10.06	10.90	9.99	10.51	6.051	10.93	7.50
	(28.43)	(18.35)	(24.81)	(30.92)	(18.60)	(26.36)	(10.33)	(16.21)	(12.55)
Total	78.63	103.4	88.74	85.35	102.8	92.83	47.64	107.9	65.53
	(113.8)	(132.2)	(122.3)	(122.0)	(130.3)	(125.9)	(53.53)	(147.2)	(95.83)
Price	538	453	488	549	456	493	485	430	458
	(134)	(85)	(116)	(131)	(82)	(114)	(138)	(104)	(125)
Panel B: Head Characteristics									
Age	46.69	45.70	46.14	46.37	45.70	45.99	48.17	45.68	46.99
	(15.26)	(14.24)	(14.70)	(15.29)	(14.2)	(14.67)	(15.04)	(14.59)	(14.87)
Male	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.95	0.95
Married	0.86	0.85	0.85	0.86	0.85	0.85	0.87	0.88	0.88
Literate	0.42	0.51	0.47	0.44	0.53	0.49	0.35	0.38	0.36
Panel C: Household Characteristics									
Size	6.33	5.97	6.13	6.26	6.03	6.13	6.65	5.53	6.12
	(4.03)	(3.77)	(3.89)	(4.04)	(3.88)	(3.95)	(3.99)	(2.91)	(3.56)
Cement/Tile Floor	0.57	0.51	0.53	0.57	0.51	0.54	0.58	0.46	0.53
Mobile	0.03	0.21	0.12	0.03	0.22	0.14	0.01	0.10	0.05
Rural	0.93	0.87	0.90	0.92	0.87	0.89	0.97	0.88	0.93
Ethnicity									
Akan	0.33	0.35	0.34	0.38	0.40	0.39	0.07	0.06	0.07
Krou	0.27	0.19	0.22	0.25	0.19	0.22	0.33	0.19	0.27
Mande North	0.04	0.05	0.05	0.04	0.05	0.04	0.03	0.09	0.06
Mande South	0.15	0.10	0.12	0.09	0.06	0.07	0.44	0.37	0.41
Voltaique	0.04	0.06	0.05	0.04	0.06	0.05	0.02	0.05	0.04
Others	0.18	0.25	0.22	0.19	0.25	0.22	0.10	0.22	0.16
Religion									
Christian	0.41	0.44	0.43	0.44	0.46	0.45	0.26	0.31	0.28
Muslim	0.21	0.27	0.24	0.22	0.26	0.25	0.14	0.31	0.22
Others	0.38	0.29	0.33	0.33	0.28	0.30	0.60	0.38	0.50
Observations	2142	2749	4891	1758	2400	4158	384	349	733

Note: In panel A, data on consumption expenditure and price per kilogram of cocoa beans are reported. Consumption expenditures are denominated in thousands of constant Franc CFA. Price is deflated by the domestic consumer price index. Approximatively, 500 FCFA correspond to $1. Categories of consumption are: investment in education and health; food and clothing expenditure; money transfers to non-resident household members; and other types of spending such as leisure, maintenance, transportation, etc. Standard deviations are reported in parentheses. Household characteristics as well as the characteristics of the household head are presented in panels B and C.
Data Source: ENV (2002) and ENV (2008).

Table 2—Standard Difference-in-Differences.

	[1] Pre-Partition	[2] Post-Partition	[3] Within-State Difference
Panel A: All Districts			
1. Northern CI (Treatment State)	10.349	11.133	0.783***
	(0.048)	(0.047)	(0.067)
	[384]	[349]	
2. Southern CI (Control State)	10.910	11.283	0.372***
	(0.022)	(0.019)	(0.029)
	[1758]	[2400]	
3. Cross-State Difference	-0.561***	-0.150***	
	(0.052)	(0.052)	
4. Difference-in-Differences	**0.411*** **		
	(0.073)		
Panel B: Split Districts			
1. Northern CI (Treatment State)	10.347	11.132	0.784***
	(0.048)	(0.049)	(0.069)
	[380]	[313]	
2. Southern CI (Control State)	10.781	11.160	0.378***
	(0.032)	(0.033)	(0.046)
	[636]	[780]	
3. Cross-State Difference	-0.434***	-0.028	
	(0.055)	(0.061)	
4. Difference-in-Differences	**0.406*** **		
	(0.082)		
Panel C: Falsification (Experiment Control)			
1. Split Southern CI	10.781	11.160	0.378***
	(0.032)	(0.033)	(0.046)
	[636]	[780]	
2. Non-Split Southern CI	10.983	11.342	0.359***
	(0.029)	(0.023)	(0.036)
	[1122]	[1620]	
3. Cross-District Difference	-0.202***	-0.182***	
	(0.045)	(0.040)	
4. Difference-in-Differences	**0.020**		
	(0.060)		

Note: Column 3 reports the within-state difference in consumption expenditure which is the post-partition expenditure minus the pre-partition expenditure for the state identified in each row. The third row of each panel reports the cross-state (or cross-district) difference in consumption expenditure (example: row 3 = row 1 - row 2). The difference-in-differences reported in the fourth row of each panel is the post-partition cross-state difference minus the pre-partition cross-state difference. Alternatively, it can be obtained by subtracting the change in expenditure in Southern CI (or Non-Split Southern CI) from the change in expenditure in Northern CI (or Split Southern CI). Standards errors are in parenthesis and number of observations are in brackets. $*$, $**$, $***$ denote statistical significant at 10%, 5% and 1%, respectively.
Data Source: ENV (2002) and ENV (2008).

Table 3—Standard Difference-in-Difference-in-Differences.

	[1] Pre-Partition	[2] Post-Partition	[3] Time Difference
Panel A: Cocoa Farmers (Treatment Group)			
1. Northern CI (Treatment State)	10.349	11.133	0.783***
	(0.048)	(0.047)	(0.067)
	[384]	[349]	
2. Southern CI (Control State)	10.910	11.283	0.372***
	(0.022)	(0.019)	(0.029)
	[1758]	[2400]	
3. Cross-State Difference	-0.561***	-0.150***	
	(0.052)	(0.052)	
4. Difference-in-Differences	0.411***		
	(0.073)		
Panel B: Other Farmers (Control Group)			
1. Northern CI (Treatment State)	10.383	10.704	0.320***
	(0.010)	(0.011)	(0.015)
	[8009]	[8347]	
2. Southern CI (Control State)	10.801	11.070	0.269***
	(0.009)	(0.007)	(0.012)
	[10236]	[16089]	
3. Cross-State Difference	-0.418***	-0.366***	
	(0.013)	(0.013)	
4. Difference-in-Differences	0.051***		
	(0.019)		
Difference-in-Difference-in-Differences	**0.360*** **		
	(0.077)		

Note: The fourth row of each panel compares cross-states relative changes in consumption among cocoa farmers (panel A) and non-cocoa farmers (panel B). The difference between these relative DD estimates gives the DDD estimation of the impact of export taxes on cocoa farmers' consumption, displayed in bold at the bottom of table 3. Standards errors are in parenthesis and number of observations are in brackets. $*$, $**$, $***$ denote statistical significant at 10%, 5% and 1%, respectively.
Data Source: ENV (2002) and ENV (2008).

Table 4—Regression Difference-in-Difference-in-Differences.

	Dependent variable is log total consumption expenditure				
	[1]	[2]	[3]	[4]	[5]
Lib	-0.418***	-0.282***	-0.750***	-0.282***	-0.283***
	(0.048)	(0.051)	(0.076)	(0.050)	(0.052)
Post	0.269***	0.288***	0.357***	0.424***	0.362***
	(0.040)	(0.041)	(0.040)	(0.091)	(0.071)
Cocoa	0.109***	0.084***	0.036	0.100***	0.098***
	(0.033)	(0.030)	(0.024)	(0.029)	(0.030)
$Lib \cdot Post$	0.051	0.011	-0.085	0.417***	-0.245
	(0.076)	(0.075)	(0.070)	(0.150)	(0.248)
$Cocoa \cdot Post$	0.103**	0.030	0.018	-0.041	-0.050
	(0.045)	(0.044)	(0.037)	(0.042)	(0.041)
$Lib \cdot Cocoa$	-0.144*	-0.137*	-0.105*	-0.112	-0.111
	(0.078)	(0.081)	(0.060)	(0.080)	(0.081)
$Lib \cdot Cocoa \cdot Post$	0.360***	0.459***	0.478***	0.250**	0.206**
	(0.117)	(0.119)	(0.111)	(0.111)	(0.099)
Constant	10.801***	10.790***	10.732***	10.733***	10.693***
	(0.027)	(0.085)	(0.107)	(0.081)	(0.086)
Observations	47572	43432	43432	43432	43432
Adjusted R^2	0.074	0.186	0.246	0.218	0.241
Household Controls	No	Yes	Yes	Yes	Yes
Province FE	No	No	Yes	No	No
Survey-Round-District FE	No	No	No	Yes	No
Survey-Round-Province FE	No	No	No	No	Yes

Note: Two-way cluster-robust standard errors at the household and census block levels are reported in parentheses. The dependent variable is per capita total consumption. $*$, $**$, $***$ denote statistical significant of the coefficient at 10%, 5% and 1%, respectively.
Data Source: ENV (2002) and ENV (2008).

Table 5—Regression Difference-in-Difference-in-Differences.

	[1] Total	[2] Education	[3] Health	[4] Transfer	[5] Clothing	[6] Food	[7] Other
Panel A: All Districts							
Lib	-0.750***	-0.529**	-0.306	0.117	-0.603***	-0.486***	-0.369
	(0.076)	(0.229)	(0.238)	(0.647)	(0.088)	(0.067)	(0.288)
Post	0.357***	0.396***	0.374***	0.625***	0.402***	0.071	0.546***
	(0.040)	(0.063)	(0.070)	(0.074)	(0.045)	(0.046)	(0.056)
Cocoa	0.036	-0.029	0.140**	0.034	0.082***	0.042*	0.070
	(0.024)	(0.041)	(0.054)	(0.055)	(0.025)	(0.023)	(0.044)
$Lib \cdot Post$	-0.085	0.036	0.115	0.071	0.062	-0.172**	-0.224**
	(0.070)	(0.098)	(0.138)	(0.107)	(0.069)	(0.073)	(0.107)
$Cocoa \cdot Post$	0.018	0.112*	-0.019	0.037	-0.053	-0.034	-0.042
	(0.037)	(0.059)	(0.066)	(0.069)	(0.037)	(0.034)	(0.068)
$Lib \cdot Cocoa$	-0.105*	0.220**	-0.070	-0.067	-0.084	-0.202***	-0.175**
	(0.060)	(0.096)	(0.100)	(0.135)	(0.075)	(0.072)	(0.089)
$Lib \cdot Cocoa \cdot Post$	0.478***	-0.235	0.369***	0.528***	0.304***	0.440***	0.450***
	(0.111)	(0.157)	(0.143)	(0.186)	(0.096)	(0.108)	(0.163)
Constant	10.732***	8.188***	7.750***	8.551***	9.762***	9.662***	8.110***
	(0.107)	(0.164)	(0.174)	(0.180)	(0.136)	(0.097)	(0.166)
Observations	43432	21831	29627	35941	41352	43363	42871
Adjusted R^2	0.246	0.202	0.117	0.199	0.182	0.297	0.157
Panel B: Split Districts							
Lib	-0.232	0.189	0.192	0.754	-0.306	-1.043***	-0.241
	(0.212)	(0.328)	(0.314)	(0.651)	(0.287)	(0.402)	(0.787)
Post	0.351***	0.321***	0.401***	0.809***	0.441***	-0.005	0.629***
	(0.049)	(0.085)	(0.103)	(0.094)	(0.052)	(0.060)	(0.070)
Cocoa	0.095***	-0.006	0.104	0.112**	0.098**	0.027	0.129**
	(0.034)	(0.055)	(0.072)	(0.048)	(0.043)	(0.028)	(0.060)
$Lib \cdot Post$	0.099	0.081	0.239	0.053	0.189*	0.163*	-0.270*
	(0.094)	(0.120)	(0.177)	(0.150)	(0.102)	(0.092)	(0.148)
$Cocoa \cdot Post$	0.029	0.153	0.091	0.103	-0.019	0.025	-0.089
	(0.060)	(0.103)	(0.093)	(0.100)	(0.073)	(0.050)	(0.098)
$Lib \cdot Cocoa$	-0.101*	0.181*	0.006	-0.061	-0.038	-0.094	-0.243**
	(0.061)	(0.108)	(0.113)	(0.128)	(0.076)	(0.070)	(0.099)
$Lib \cdot Cocoa \cdot Post$	0.332***	-0.250	0.110	0.278	0.115	0.189*	0.508**
	(0.114)	(0.168)	(0.146)	(0.187)	(0.113)	(0.109)	(0.201)
Constant	10.261***	8.097***	6.544***	8.028***	9.660***	9.782***	7.347***
	(0.162)	(0.350)	(0.275)	(0.291)	(0.257)	(0.372)	(0.406)
Observations	22469	11402	15639	18390	21481	22427	22174
Adjusted R^2	0.220	0.168	0.115	0.209	0.176	0.268	0.131
Household Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Two-way cluster-robust standard errors at the household and census block levels are reported in parentheses. Dependent variables are log per capita consumption by categories of spending displayed in each column. In all specifications, province fixed effects, household-level and individual-level controls are included. $*$, $**$, $***$ denote statistical significant of the coefficient at 10%, 5% and 1%, respectively.
Data Source: ENV (2002) and ENV (2008).

Table 6—Distributional Effects using Quantile Difference-in-Difference-in-Differences.

	Quantile Regression Estimates			
	[1]	[2]	[3]	[4]
	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	**OLS Estimates**
Panel A: All Districts				
Lib	-0.528	-0.479	-0.161	-0.750***
	(0.380)	(0.555)	(0.327)	(0.076)
Cocoa	0.017	0.042	0.051**	0.036
	(0.027)	(0.032)	(0.022)	(0.024)
$Lib \cdot Cocoa$	-0.065	-0.111	-0.061	-0.105*
	(0.090)	(0.083)	(0.079)	(0.060)
Post	0.373***	0.359***	0.379***	0.357***
	(0.044)	(0.052)	(0.042)	(0.040)
$Lib \cdot Post$	-0.101	0.046	-0.035	-0.085
	(0.094)	(0.084)	(0.071)	(0.070)
$Cocoa \cdot Post$	0.021	-0.024	-0.007	0.018
	(0.037)	(0.039)	(0.035)	(0.037)
$Lib \cdot Cocoa \cdot Post$	0.568***	0.468***	0.251**	0.478***
	(0.150)	(0.132)	(0.102)	(0.111)
Constant	10.202***	10.745***	11.228***	10.732***
	(0.111)	(0.105)	(0.092)	(0.107)
Observations	43432	43432	43432	43432
Panel B: Split Districts				
Lib	-0.277	-0.335	-0.005	-0.232
	(0.543)	(0.522)	(0.801)	(0.212)
Cocoa	0.067*	0.077**	0.059**	0.095***
	(0.040)	(0.036)	(0.027)	(0.034)
$Lib \cdot Cocoa$	-0.067	-0.095	0.008	-0.101*
	(0.078)	(0.080)	(0.071)	(0.061)
Post	0.347***	0.400***	0.409***	0.351***
	(0.063)	(0.060)	(0.052)	(0.049)
$Lib \cdot Post$	0.086	0.201**	0.118	0.099
	(0.118)	(0.100)	(0.095)	(0.094)
$Cocoa \cdot Post$	0.027	-0.022	0.038	0.029
	(0.066)	(0.055)	(0.069)	(0.060)
$Lib \cdot Cocoa \cdot Post$	0.474***	0.317**	0.076	0.332***
	(0.179)	(0.130)	(0.122)	(0.114)
Constant	9.789***	10.456***	11.074***	10.261***
	(0.487)	(0.246)	(0.476)	(0.162)
Observations	22469	22469	22469	22469
Household Controls	Yes	Yes	Yes	Yes
Province Fixed Effects	Yes	Yes	Yes	Yes

Note: One-way cluster-robust standard errors at the census block level are reported in parentheses. $*$, $**$, $***$ denote statistical significant of the coefficient at 10%, 5% and 1%, respectively.
Data Source: ENV (2002) and ENV (2008).

Table 7—Falsification using Difference-in-Differences.

	Including Cocoa Farmers		**Excluding Cocoa Farmers**	
	All Districts	Split Districts	All Districts	Split Districts
	[1]	[2]	[3]	[4]
Lib	-0.773***	-0.225	-0.758***	-0.029
	(0.074)	(0.211)	(0.079)	(0.511)
Post	0.358***	0.355***	0.349***	0.353***
	(0.040)	(0.050)	(0.040)	(0.049)
$Lib \cdot Post$	-0.065	0.120	-0.078	0.096
	(0.069)	(0.094)	(0.070)	(0.094)
Constant	10.737***	10.263***	10.734***	10.410***
	(0.107)	(0.161)	(0.111)	(0.342)
Observations	43432	22469	38832	20530
Adjusted R^2	0.244	0.218	0.241	0.216
Household Controls	Yes	Yes	Yes	Yes
Province Fixed Effects	Yes	Yes	Yes	Yes

Note: Two-way cluster-robust standard errors at the household and census block levels are reported in parentheses. The dependent variable is the logarithm of per capita total consumption expenditure in constant domestic currency. In all specifications, province fixed effects, households and individual farmer's characteristics are included. $*$, $**$, $***$ denote statistical significant of the coefficient at 10%, 5% and 1%, respectively.
Data Source: ENV (2002) and ENV (2008).

Table 8—Investigating Alternative Potential Driving Factors using DDD estimation.

	[1]	[2]	[3]
Panel A			
	Time Worked	**Output**	**Productivity**
All Regions	-0.433	-0.077	0.131
	(2.108)	(0.109)	(0.164)
Observations	37656	16426	12562
Adjusted R^2	0.074	0.188	0.126
Split Regions	-4.571*	-0.105	0.175
	(2.442)	(0.120)	(0.189)
Observations	19312	7007	5351
Adjusted R^2	0.063	0.168	0.160
Panel B			
	Hired More Workers	**Why?**	
		Available Labor	**High Sales Price**
All Regions	0.132***	0.034	0.077*
	(0.049)	(0.120)	(0.042)
Observations	12129	3862	3862
Adjusted R^2	0.057	0.112	0.106
Split Regions	0.066	0.001	0.015
	(0.076)	(0.161)	(0.038)
Observations	6088	2090	2090
Adjusted R^2	0.074	0.128	0.061
Panel C			
	Increased Cropland Size	**Why?**	
		Available Labor	**High Sales Price**
All Regions	0.189***	-0.025	0.298***
	(0.045)	(0.097)	(0.079)
Observations	43276	11787	11787
Adjusted R^2	0.057	0.073	0.085
Split Regions	0.125**	-0.032	0.184**
	(0.055)	(0.102)	(0.093)
Observations	22375	6581	6581
Adjusted R^2	0.031	0.063	0.076
Household Controls	Yes	Yes	Yes
Province Fixed Effects	Yes	Yes	Yes

Note: Two-way cluster-robust standard errors at the household and census block levels are reported in parentheses. In panel A, dependent variables are: weekly hours worked in farming (column 1), log of output produced in kg (column 2), log (output/cropland size) (column 3). In panel B and C, dependent variables are dummies for hiring more labor, increasing cropland size (column 1), availability of labor (column 2), and higher farm-gate prices (column 3). In all specifications, province fixed effects, households and individual farmer's characteristics are included. $*$, $**$, $***$ denote statistical significant of the coefficient at 10%, 5% and 1%, respectively.
Data Source: ENV (2002) and ENV (2008).

Table 9—Price Mechanism using Standard Difference-in-Differences.

	[1] Pre-Partition	[2] Post-Partition	[3] Within-State Difference
Panel A: All Districts			
1. Northern CI (Treatment State)	484.60	430.12	-54.48***
	(7.95)	(6.07)	(10.04)
	[301]	[293]	
2. Southern CI (Control State)	549.10	455.69	-93.41***
	(3.49)	(1.77)	(3.57)
	[1399]	[2151]	
3. Cross-State Difference	-64.49***	-25.57***	
	(8.38)	(5.29)	
4. Difference-in-Differences	**38.93*** **		
	(9.50)		
Panel B: Split Districts			
1. Northern CI (Treatment State)	483.32	430.77	-52.55***
	(7.91)	(6.32)	(10.28)
	[299]	[268]	
2. Southern CI (Control State)	528.88	436.60	-92.28***
	(5.94)	(3.43)	(6.47)
	[486]	[664]	
3. Cross-State Difference	-45.56***	-5.83	
	(9.79)	(6.73)	
4. Difference-in-Differences	**39.73*** **		
	(11.67)		
Panel C: Falsification (Experiment Control)			
1. Split Southern CI	528.88	436.60	-92.28***
	(5.94)	(3.43)	(6.47)
	[486]	[664]	
2. Non-Split Southern CI	559.86	464.21	-95.65***
	(4.28)	(2.02)	(4.22)
	[913]	[1487]	
3. Cross-District Difference	-30.98***	-27.61***	
	(7.30)	(3.79)	
4. Difference-in-Differences	**3.37**		
	(7.53)		

Note: Column 3 reports the within-state difference in per kilogram farm-gate price which is the post-partition price minus the pre-partition price for the state identified in each row. The third row of each panel reports the cross-state or cross-district difference in price per kilogram (example: row 3 = row 1 - row 2). The difference-in-differences reported in the fourth row of each panel is the post-partition cross-state difference minus the pre-partition cross-state difference. Alternatively, it can be obtained by subtracting the change in price in Southern CI (or Non-Split Southern CI) from the change in price in Northern CI (or Split Southern CI). Standards errors are in parentheses and number of observations are in brackets. $*$, $**$, $***$ denote statistical significant at 10%, 5% and 1%, respectively.
Data Source: ENV (2002) and ENV (2008).

Table 10—Price Mechanism using Regression Difference-in-Difference.

	All Districts			Split Districts		
	[1]	[2]	[3]	[4]	[5]	[6]
Lib	-64.494***	-65.843***	-74.530***	-45.560**	-46.926**	-322.553***
	(16.751)	(16.787)	(19.215)	(19.552)	(19.517)	(2.820)
Post	-93.410***	-92.155***	-91.196***	-92.276***	-91.170***	-100.175***
	(6.967)	(6.883)	(6.413)	(13.421)	(13.869)	(12.022)
$Lib \cdot Post$	38.927**	46.538**	53.609***	39.730*	47.104**	63.796***
	(19.782)	(19.727)	(16.854)	(21.838)	(21.551)	(19.344)
Male		-5.033	2.513		-13.458	-10.709
		(10.355)	(10.933)		(15.813)	(17.415)
Age		-0.077	-0.151		-0.338	-0.374
		(0.153)	(0.159)		(0.281)	(0.298)
Literate		7.830**	6.561**		1.404	4.321
		(3.357)	(3.310)		(6.069)	(6.732)
Cement/Tile		9.318**	6.070		7.415	-0.672
		(3.859)	(4.166)		(6.093)	(5.596)
Mobile		1.500	-2.256		6.960	3.115
		(3.726)	(3.749)		(5.993)	(7.909)
Rural		36.415***	39.204***		37.561***	43.652***
		(5.917)	(6.892)		(11.897)	(11.535)
Constant	549.097***	514.880***	537.733***	528.876***	517.518***	762.330***
	(6.167)	(14.238)	(15.841)	(12.287)	(32.038)	(31.439)
Observations	4144	3910	3910	1717	1582	1582
Adjusted R^2	0.152	0.162	0.250	0.117	0.126	0.262
Province FE	No	No	Yes	No	No	Yes

Note: Two-way cluster-robust standard errors at the household and census block levels are reported in parentheses. The dependent variable is the farm-gate price per kilogram of cocoa received by each individual farmer. In columns 1-3 and 4-6, estimates using the full-sample, and the sub-sample of split districts are reported, respectively. In each sub-sample, three specifications are considered: baseline estimates without any controls (Columns 1, and 4); estimates with household's controls such as demographics and wealth proxies (Columns 2, and 5); and estimates with both household's controls and province fixed effects (Columns 3, and 6). $*$, $**$, $***$ denote statistical significant of the coefficient at 10%, 5% and 1%, respectively.
Data Source: ENV (2002) and ENV (2008).

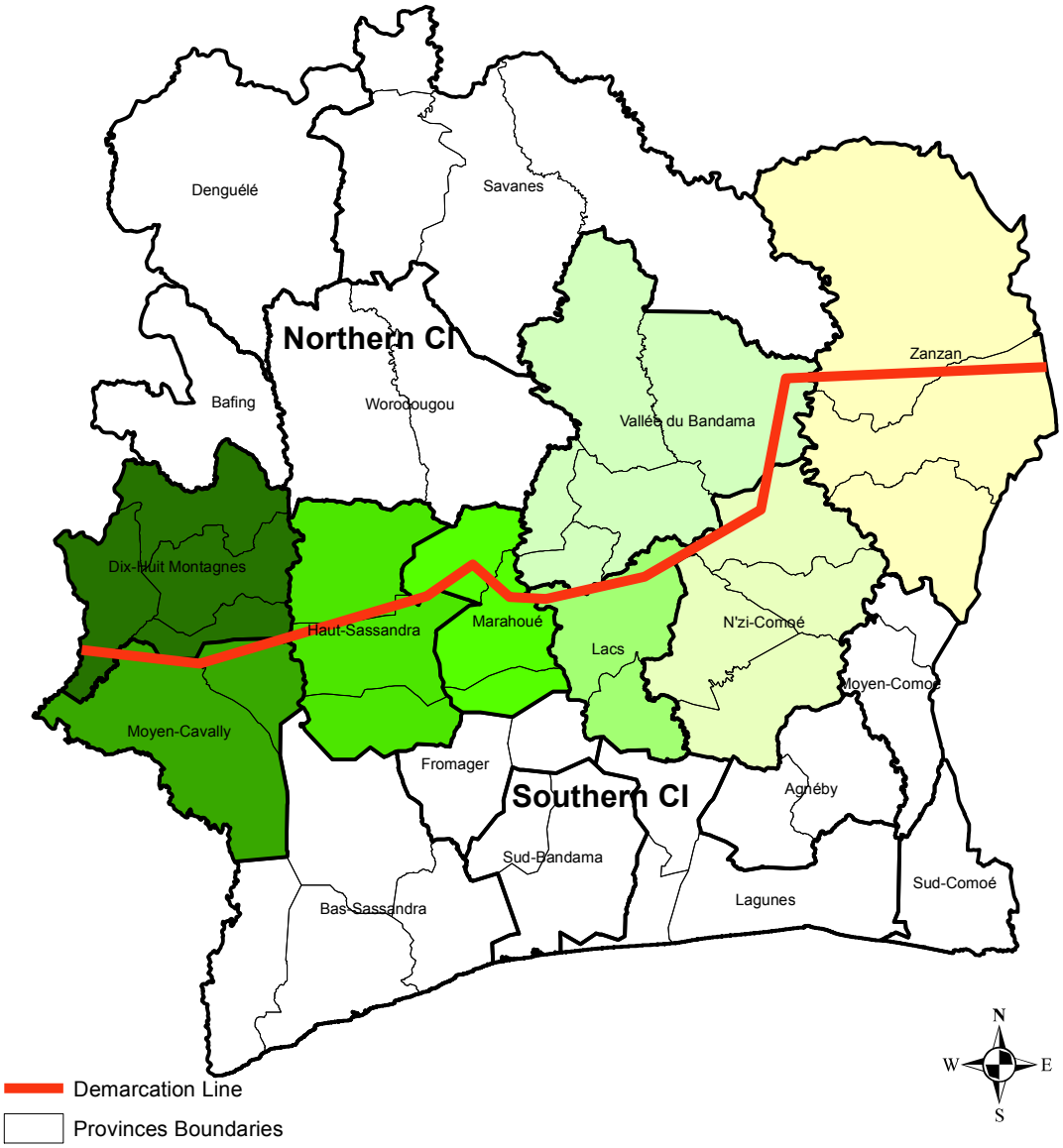

Figure 1. Côte d'Ivoire as Two de facto States (2002-2007)

Note: The demarcation line separating Northern and Southern CI is a buffer zone placed under the surveillance of international forces. Regional and provincial boundaries are described by thick and thin black lines, respectively. The colored (or dark in black-and-white paper) regions with different levels of degradation represent the districts split between the two states.
Data Source: Author's own calculations using Global Administrative Areas Database.

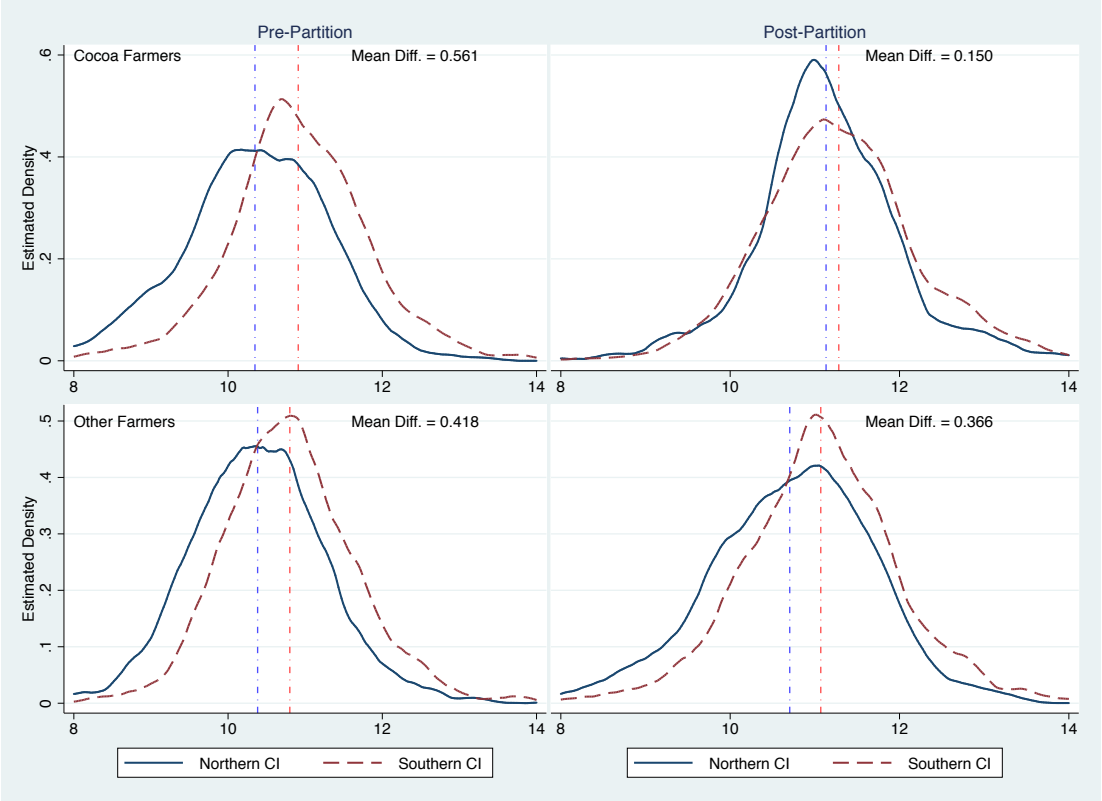

Figure 2. Pre and Post-Partition Cross-States Consumption Expenditure Distribution by Sector

Note: Each panel compares the kernel distribution of the logarithm per capita consumption expenditure by sector across states. The mean difference is computed as the average log consumption expenditure in Southern CI (red or dashed line) minus the average log consumption expenditure in Northern CI (blue or solid line).
Data Source: ENV (2002) and ENV (2008).

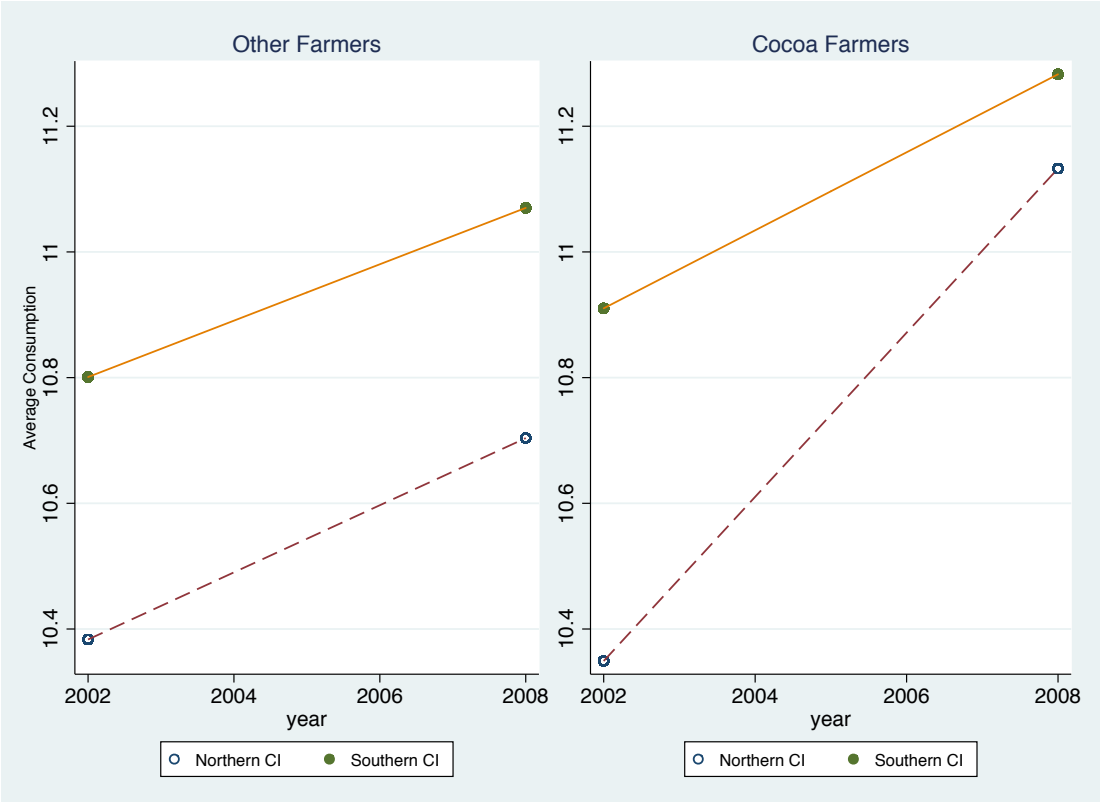

Figure 3. Pre and Post-Partition Differences in Average Log Consumption Expenditure.

Note: Each panel compares the differences in average log consumption expenditure between other farmers (left panel) and cocoa farmers (right panel) across states.
Data Source: ENV (2002) and ENV (2008).