Emergence and impact of transaction costs in developing economies: the case of the Nicaraguan coffee industry during the Sandinista Regime (1979-1990)*

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This paper analyses transaction costs emergence and impact within the Nicaraguan coffee industry during the Sandinista Regime (1979-1990). It is argued that traditional transaction cost economics requires adjustment to be successfully applied in developing countries since it partially ignores the role of governmental policies and institutional change. Although North linked transaction costs to economic development theories, it is yet not clear how these influence industrial performance. A framework combining Williamson's and North's theories is therefore devised to explain industry evolution in a Latin American economy by taking into account both power relations and incentives structures issues. Case study evidence highlights the importance of assessing transaction costs from a dynamic and strategic position taking into account country specific contexts; thus filling a precise gap in the academic literature.

Key words – Central America, Nicaragua, Sandinista, transaction costs, coffee, institutional change, power relations, strategic behaviour.

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1. Introduction

In its beginnings, the impact of transaction costs on economic performance was limited to an acknowledgement of their influence on the decisions of firms between market and internal procurement (Coase, 1937). Nowadays, theoretical and empirical studies suggest that transaction costs are critical in explaining not only the organizational structure of firms, but the composition of industries and market emergence and functioning. As a result, they are present not only in the industrial organization or economics of the firm literature but in the development economics literature as well. Nevertheless, there seems to be significant differences between how transaction costs have been assessed depending on the assumptions made about the degree of economic development in which firms are circumscribed. The fact is that the traditional transaction cost economics (TCE) framework (as portrayed by Williamson, 1985) was initially devised to analyze transaction costs in developed country situations and it will be argued that this framework requires adjustment in order to serve its same purpose in the context of developing countries. It will also be illustrated that this objective can be achieved by incorporating North's theories of development and institutional economics and by integrating the dynamic effects of agents' strategic behavior.

In this paper, section 2 involves a description of a transaction costs framework for developing economies where its conceptual origins, key advantages and functional properties are explained. In section 3, the Nicaraguan coffee industry case study problem is introduced. Section 4 presents a discussion of the empirical evidence under the light of the proposed transaction costs framework. This is followed by brief conclusions.

2. A transaction cost framework for developing economies

The attempt to construct a framework to analyze the emergence and impact of transaction costs in developing economies is novel in itself. The proposed framework goes beyond the traditional TCE

approach for developing countries (i.e. Gabre-Mahdin 2001, Holloway 2000, and Park 2002). Yet it is based to a great extent on a combination of the arguments of Williamson and North about the role of transaction costs in economic exchange. It will become evident, as we discuss, that the claims of these authors have been referring to transaction costs as emerging from (apparently) dissimilar sources and as a consequence have been applying the concept at different levels of abstraction. However, if an explicit link between the two is established, a clearer understanding of the nature of transaction costs in developing countries could be achieved. The framework at hand is developed with the idea of overcoming the main limitations of these two well-known approaches and of improving the explanatory power of transaction costs concerning industrial evolution and market functioning in a Latin American developing economy. In this section, elements taken from traditional TCE and North's theories are stated along with an explanation of how particular criticisms may be surmounted.

(a) Traditional transaction costs economics: methodology and criticisms

Our framework embraces the main statements of traditional TCE. In other words, it incorporates the premise that the choice of a firm contractual arrangement (and therefore its boundary) depends on two key behavioral assumptions (bounded rationality and opportunism) and the three dimensions of transactions (asset specificity, uncertainty and frequency). Likewise, it integrates the idea that there is a positive relationship between the three dimensions of transaction and the movement from one contractual form to another; where vertical integration corresponds to the inclusion of a transaction characterized by higher levels of asset specificity, uncertainty and frequency.

Williamson has extended Coase's conception of transaction costs as the costs of using markets by arguing that their definition would also include the costs arising from inefficiencies in the selection

of the adequate institutional arrangement of a firm. In this perspective, the examination of transaction costs, which he defines as "the economic equivalent of friction in physical systems" (1985, p 19) can mainly be undertaken by relying on comparative institutional analysis, where one mode of contracting is compared with another. Despite its static view, TCE has provided crucial explanations to what were before considered unusual contracting practices and industry structures.[1] Put differently, the issue is therefore to inspect whether transactions are correctly assigned to governance structures and "the difference between rather than the absolute magnitude of transaction costs" is what matters (Williamson, 1985, p 22). In this traditional TCE scenario, changes in the institutional environment are treated as shift parameters which are only thought to part determine the comparative costs of spot market, hybrid and hierarchal governance structures. It is particularly with this last assertion that our framework substantially disagrees for it aims at a more complete analytical approach that explicitly includes the impact of changes in the macro-institutions since these are considered to be of a more unstable nature in developing countries.

There are however other strong criticisms (besides the disregard of the effects of macro-institutional changes) to the conceptual arrangements of traditional TCE that should be tackled. The main ones are based on the nature of the behavioral assumptions and dimensions of transactions as well as the role of power. On the first point, Pratten (1997) argues that Williamson's attempt to move towards a richer account of human agency (by incorporating bounded rationality and opportunist assumptions on behavior) is incomplete and more importantly incompatible with "the operational sophistication of economic orthodoxy" (p 794). Moreover, according to Pratten if a realistic approach to human behavior is to be incorporated, not only will "constant conjunctions be rare occurrences" but it is absolutely necessary to give an account of the origins and role of influence and trust in economic

[1] Carter and Hodgson (2006)

relationships. This hints to the fact that power issues have been substantially disregarded in traditional TCE.

According to Palermo (2000), economic power can be defined as "the ability of one person or group to deliberately generate economic results even (but not necessarily) against the willingness of others" (p 8). The author argues that if it is acknowledged that institutional environments pose a number of constraints and it is within such constraints that choices are developed (voluntarily and freely) according to individual preferences and if the premise (which Williamson also holds) of recognizing the role of power clashes in institutional evolution is also accepted; it follows that the institutional arrangements appearing in an economy are the direct consequence of power relations which Williamson has rejected in his actual framework by stating that the concept is analytically vague and of secondary relevance (1997, p 14). Palermo (2004 p 14-19) concludes that the asymmetric power relations between the parties derives from the establishment of social relations that are capitalistic and that class analysis is therefore necessary to understand the processes through which free voluntary interactions modify and are modified by the institutional system.

Furthermore, if it is recognized that power in the economic sense becomes relevant only under the presence of asset specificity (which incorporates the concept of sunk costs) the assumption that this particular dimension of transactions is an exogenous component is challenged. Whatever the case may be, agents will consider the evolution of their institutional environment while studying their investment decisions. Likewise, uncertainty, as a dimension of transactions in the traditional TCE approach, is mainly made dependent to the limitations of bounded rationality and opportunistic actions of agents. However, it is not acknowledged that an unstable institutional context may affect incentives of individuals to alter their behavior while transacting.

The main point is that there is a lack of explicit recognition of a two-way interaction between firms and their supra-environment. Put differently, a clear mechanism illustrating how institutional arrangements (as selected by firms) and institutional environment shape and influence each other is absent. Briefly, taking the dimensions of transactions as exogenous components and omitting agents' strategic behavior may be in part explaining why TCE fails to adapt adequately into the context of developing economies that are characterized by more varying institutional contexts. The main idea is that issues of power and the nature of the interactions among agents and their environment introduce a dynamic element to the analysis which confronts the static comparative approach of traditional TCE. In addition, the study of agents' strategic reactions is crucial to explain the evolution of firms' structure. Our proposed framework partly surmounts these last points by introducing the theories of North and later focusing on the drastic experience of a Latin American country.

(b) North's approach to transaction costs and development

Unlike Williamson, North embraces the fact that transaction costs and incentive structures are determined by the institutional environment. While Williamson uses asset specificity as the main determinant to agents' transaction cost minimizing strategies, North points out that it is "the complex institutional framework of formal rules, informal constraints, and enforcement that together make possible low cost transacting" (North, 1990, p 58). This institutional framework includes property rights systems, courts and judicial apparatus, development of voluntary organizations and norms; that holistically affect economic performance by introducing an incentive scheme and a corresponding set of transaction costs constraints that in the long run determine an economy's growth path and potential.

In his quest for explaining the causes of underperformance, North not only explicitly recognizes the impact of the institutional environments but at the same time and unlike Williamson, he stresses the effects of power exercised by firms and various organizations in the construction and delimitation of the institutional framework. For instance, North argues that "institutions are not necessarily or even usually created to be socially efficient; rather they, or at least the formal rules, are created to serve the interests of those with the bargaining power to devise new rules" (1990, p 16). Consequently, if it serves the interests of a few agents of high bargaining power to sustain unequal and inefficient institutions, the opportunity for readapting the institutional environment and obtaining economic advancement is diminished because the right incentives are never present. Thus an institutional lock-in appears in the same way that technologies become locked-in in Arthur's analysis (1988, 1989). Path dependency is therefore perpetuated, consolidating and enhancing the gap between rich and poor countries.

In North's perception, institutions typically change incrementally rather than in a discontinuous fashion. This is because formal rules, which may change overnight as the result of political or judicial decisions require that informal constraints (embodied in customs, traditions, codes of conduct etc) are also accordingly altered. This view suggests a rather fixed and static environment, where once an institutional equilibrium has been achieved, none of the players would find it advantageous to devote resources into restructuring the agreements (North, 1990, p 6, 86, 93). Such a conception of institutional change is the basis to the explanation of sustained underperformance in North's theory.

As it will become apparent, the transaction costs framework for developing economies will take North's idea that firms are not passive subjects regarding their macro-institutional context; and that they will use their power to obtain strategic gains. Moreover, the linkage between the institutional

environment and transaction costs is also absorbed. Nevertheless, the conception of the lock-in will be altered to account for the more varying nature of developing economies scenarios. To summarize, even though power issues are taken into account, the inclusion of an institutional lock-in does not reflect the potential for dynamic change that results from the agitated and asymmetric interactions and negotiations which take place between different economic agents (government, firms, unions etc.) in developing countries. Other chief concerns regarding North's approach is the obvious inability to capture the economic costs of diverse macro-institutions; which is also correlated to the problem of dealing with the uniqueness of each nation's institutional configuration when executing both theoretical and empirical analysis.

(c) Advantages of an integrated framework to analyze transaction costs in developing economies

The first advantage of designing a transaction costs framework for developing economies is that the unstable nature of the institutional environments in most developing countries may be accounted for. Macro-institutions tend to be more varying than what is implied by both Williamson and North. For instance, government policies and interventionist programs become dominant factors in the sustainability and expansion of economic activity. And it must be acknowledged that in developing countries, changes in policy environments are usually aimed, with different rates of success, at altering a nation's path dependency. Each economic policy affects incentives or introduces new ones that may reinforce, counterbalance or contradict the incentives of other long existing or recent policies thus altering how individuals approach specific transactions. This implies the existence of a political and economic agenda that is usually characterized by unpredictability and uncertainty which ultimately imposes high costs on economic agents who have to spend resources not only gathering information to comply with new rules but also readapting their governance structures to adjust

contractual arrangements and create safeguards for their investments in the context of inconsistent institutional environments and if possible aiming at altering the scenario conditions in their favor.

Moreover it is important to underline that the perception of the state in a developing country differs sharply from that commonly present in developed countries. Borner, Brunetti and Weder (1995) argue that in developing countries, societies generally function without consistently enforced laws. As a result, there is strong pressure to behave opportunistically. The solution requires the introduction of rules enforced by a powerful third party, the state, which punishes deviations strongly enough to guarantee that agents act in a mutually beneficial manner. But the "complex network of control mechanisms that work together to limit the power of the strong third party" (ibid, p 45) has not effectively evolved in developing countries. The authors conclude (in their case study based on the Nicaraguan experience) that this unilateral power of the state introduces an inherent danger because it allows for arbitrary inconsistent action which creates a persistent institutional instability that hinders private investment and impedes economic growth.

In other words, a more realistic analytical framework for developing economies would recognize the reactions and interactions not only among agents but a two way channel of influence regarding their institutional environment. This last element constitutes the main novelty of the proposed transaction costs framework. It can now be stated that an integrated transaction costs framework aimed at analyzing the industrial performance and overall economic evolution of developing countries could be summarized as in Figure 1.

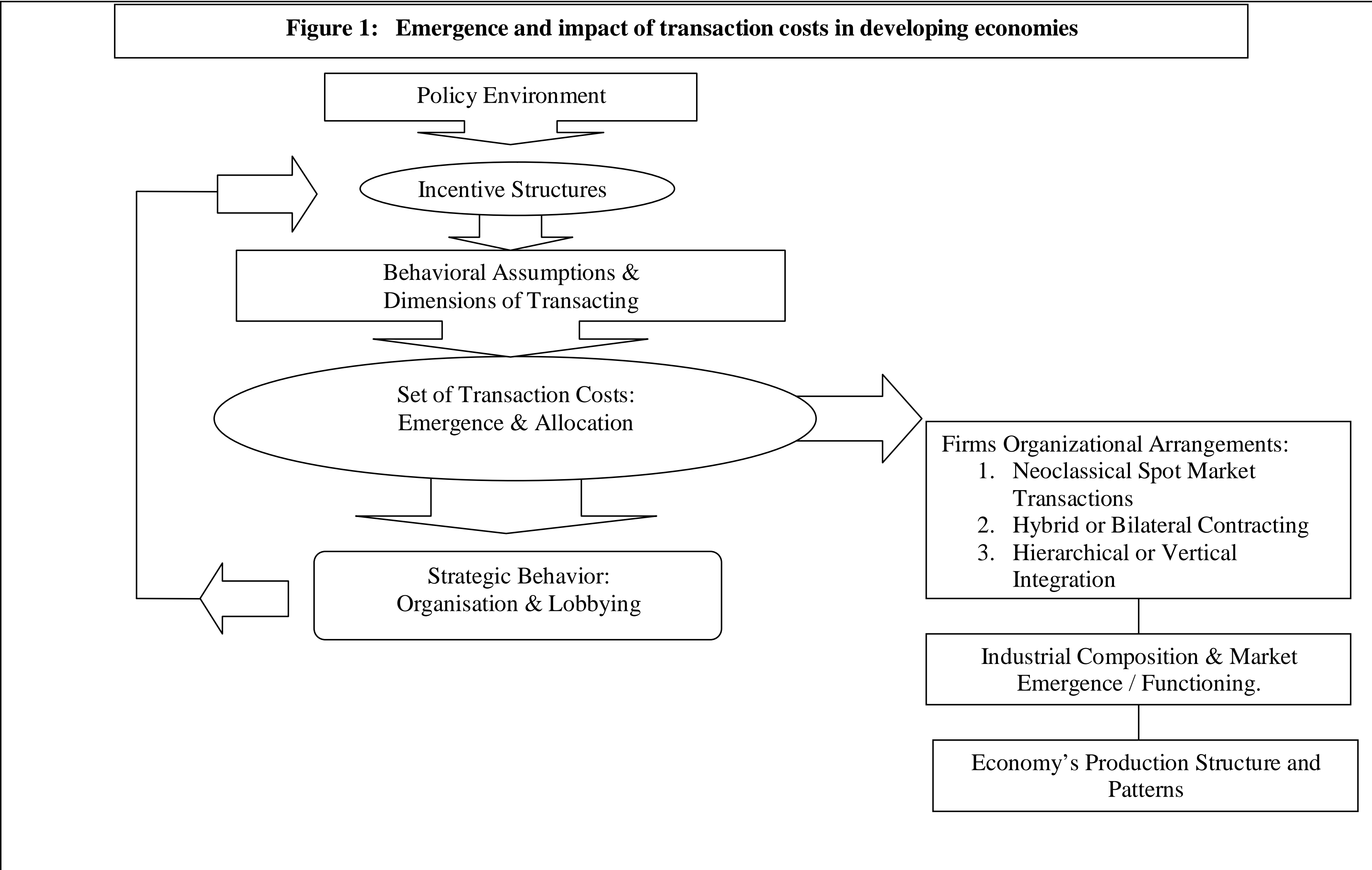
Figure 1: Emergence and impact of transaction costs in developing economies
Policy Environment
Incentive Structures
Behavioral Assumptions & Dimensions of Transacting
Set of Transaction Costs: Emergence & Allocation
Strategic Behavior: Organisation & Lobbying
Firms Organizational Arrangements:
1. Neoclassical Spot Market Transactions
2. Hybrid or Bilateral Contracting
3. Hierarchical or Vertical Integration
Industrial Composition & Market Emergence / Functioning.
Economy's Production Structure and Patterns

(d) Functional properties of a transaction costs framework for developing economies

To overcome the limitations of both Williamson and North's approaches, a transaction costs framework aimed at analyzing the economic performance and evolution of developing countries at the industry level must narrow down the institutional effects of the policy environment and must incorporate the role of power in the shaping of incentives structures and modes of conducting transactions. As represented in Figure 1, the first issue can be tackled by studying how specific government policies impact on the dimensions of transactions and the behavior of agents in a given industry. In more detail, changes in national programs or introduction of new ones are by their nature aimed at altering incentives of different economic agents. Once these alterations in the incentive structures are recognized, it is possible to assess how these might affect the levels of opportunism and bounded rationality along with changes in the levels of uncertainty, frequency and asset specificity of particular transactions. This first step of the analysis has a double purpose for it improves on both Williamson and North's frameworks.

As it has been averred, the main problem with North's approach is that its application and use (though theoretically logical and widely accepted) have not been successfully applied in empirical terms (particularly at the industry level) and when this has been attempted the results tend to be unspecific and broad (e.g. Benham 2000, De Soto 1989 and 2000). What Figure 1 portrays by linking the "Policy Environment" to the "Incentives Structures" and "Dimensions of Transactions & Behavioral Assumptions" (as defined by Williamson), is that it is essential to confine the effects of the institutional environment to improve testability. Once the impact of the macro-institutional changes (in terms of governmental policies) on a specific industry are examined and the effects on both incentives, behavioral assumptions and the dimensions of transactions are traced, the theoretical

shortcoming of traditional TCE regarding its omission of the institutional environment, can be overcome because dimensions of transactions have been made endogenous.

From this point onwards, the analysis follows closely the statements of traditional TCE, but a key digression is the introduction of feedback effects to account for the role of power. These feedback effects are aimed at capturing the strategic nature of agents' behavior that is usually omitted in traditional TCE analyses and so commonly present in the socio-economic and political agendas of Latin American estates.

In other words, agents' behavior is assessed not only in terms of their choices regarding the most efficient internal organization plan of production to economize on transaction costs and the consequences this has for industrial composition; but also in terms of their reactions to perpetuate, alter or detach from the institutional environment that is constraining them through specific policy enactments. These reactions or feedback effects (aimed at protecting investments, securing profits or rent seeking) may take several forms. Agents might get involved in corrupt practices to influence government practice or simply adopt a wait and see attitude or try to supplement or compensate internally for misguided intervention which has consequences in their productive activities and organizational schemes that cannot be explained with the traditional TCE approach. Ultimately, it can be expected that these feedback effects will re-shape the incentive structures, alter the initial allocation of transaction costs to a particular exchange and the end result of policy applications become distorted thus diverting from the aimed long-run production patterns.

This transaction cost framework follows a traditional transaction cost rationale to explain changes in firms' institutional arrangements and industry structures, but it goes a step forward by also

establishing a link between the chosen organizational structures and the functioning of relevant markets in an industry. Eventually, the ways markets work will determine the degree of economic activity and potential growth and development of a country, bringing us back to North's assertions.

A key point of the framework is that government intervention not only introduces incentives and costs to trading but that the strategic response of agents must be examined to understand the evolution of internal organizational structures. In the end, both their strategies on institutional arrangements and their attempts of reshaping (or detaching from) the institutional context itself (i.e. lobbying, corruption or autarky) bring about a more rich and dynamic picture to analyze economic organization and performance in developing countries. To move into an empirical test of the proposed framework, it is necessary to focus on how specific public intervention and development programs shape transaction costs' dimensions in a particular industry.

3. Case Study: The Nicaraguan coffee industry during the Sandinista Regime (1979-1990)

(a) Aims and methodology

As suggested, the aim of this case study is to serve as a test for the proposed framework which involves an explanation of the appearance and role of transaction costs in developing economies at the industry level. There are specific reasons for such country and industry selection. First, Nicaragua was selected since it is a representative example of how Latin American politics and economics function. This Central American country scenario is also appropriate given that its quite contrasting policy environments have been imposed within a relatively short time period. Second, of all the industries within the Nicaraguan economy, coffee was selected because of its relevance as a major export crop in the sub-continental region. In addition, the fact that coffee cultivation is characterized by investments that are highly durable requiring growers to plan in terms of longer time horizons

which impose higher entry and exit barriers; ultimately implying that the degree of asset specificity in the industry is a valuable element in the transaction costs economics analysis.

Given that the examination of the agents' change of behaviors will ultimately reveal how and what type of transaction costs emerged and how these re-shaped production patterns; the units of analysis are the individuals' reactions to a set of Sandinista policies that altered their day to day transactions within the Nicaraguan coffee industry. Such reactions were captured through carefully designed face to face interviews[2]. The discussed topics included the land reform process, the institution of new commercial relations with the government marketing agency: ENCAFE[3], the regulations on access to factors of production, credit and technological assistance programs. Arguments were thus categorized as representing elements of changes in the policy environment, alterations to the incentive structures, issues related to the three dimensions of transactions and the standard behavioral assumptions, actual examples of transaction costs or benefits and all feedback effects as well as the corollaries for the industry structure and overall performance.

Before we move into the actual discussion of results it is necessary to include a general description of the coffee production process (Subsection b) and the country's coffee industry background prior to the Sandinista Revolution (Subsection c). Once the general context is in perspective, in Section 4, the

[2] Twenty nterviews with agents of different sizes (large, medium & small) from different geographical regions and opposing political views were conducted.

	No. of Coffee Growers
Size:	7 Large, 7 Medium & 6 Small
Geographical Location:	13 Northern region, 67Pacific region
Political Affiliation:	12 Sympathizers, 6 Non-Sympathizers, 2 Neutral

Two Sandinista policy makers were also interviewed. One of them was the person responsible for the grand design of the Sandinista Agrarian Reform. The other was the head of the Sandinista government's coffee marketing agency: ENCAFE.

* Interview transcripts in Spanish and English are available upon request

[3] ENCAFE: Empresa Nicaragüense de Café or Nicaraguan Coffee Enterprise.

framework will be implemented to analyze specific transactions of the labor[4] and the output market of the Nicaraguan coffee industry in the 1980's.

(b) Characteristics of coffee production in Nicaragua

Given the nature of investment in coffee production that not only requires substantial initial investment in durable assets but the fact that the highest pecuniary returns occur five to fifteen years after trees have been planted; only financially better off agents enter and remain in the industry. Coffee production demands high knowledge specificity as well. It is not only essential to purchase land (whose value and suitability diverge according to agro-climatic zones) but also to select the appropriate technology to specific coffee variety. In addition, to initiate the cultivation of trees it is necessary to secure their balanced insertion in the environment. Compared to other agro-export crops, coffee is labor intensive because the trees necessitate constant attention in terms of grass and shadow regulation, fertilizations and plague supervision. The density of trees per manzana[5] and therefore potential yields depend considerably on the growers' ability to effectively conduct such maintenance tasks. Permanent labor is thus required in coffee farms but during harvest season (November through February) substantial additional labor is hired. The collection of the coffee cherry also involves particular know how because an inappropriate procedure damages branches affecting future pollen dissemination which reduces future yields. Clearly, temporary and especially permanent labor supervision costs are of extreme relevance. As with any production process input substitution is possible. However, in coffee production the substitution of permanent labor (that is in charge of key maintenance tasks) for agricultural equipment (i.e. tractors) to control for plagues or shadow levels comes at the expense of higher yields because it entails a lower density of trees per manzana.

[4] Analyses of other key inputs markets (i.e. fertilizers, agricultural equipment and credit) and the specific government actions that affected them have also been prepared and results are available upon request.
[5] Manzana is a Nicaraguan land measure equivalent to 0.7 hectare.

In Nicaragua, the categorization of coffee growers is mainly guided by farm land extensions. Historically, there has been a positive correlation between land extension, the use of agricultural inputs and wealth of coffee growers. For instance, the larger the coffee farm, the better off the coffee grower is likely to be and, in turn, the higher the input utilization is in terms of both labor and fertilizers thus bringing about higher yields. Medium and smaller producers use smaller proportions per manzana and many small traditional producers can only afford to introduce labor to sustain their production that is naturally characterized by smaller yields.

After collection, coffee must be washed and dried so that the grains are toasted and grounded. Not only specific temperature and humidity controls are necessary to ensure quality standards; coffee grains must also be packed using special bags to preserve quality. The percentage of the grains left for internal consumption are usually grounded and processed by domestic manufacturers. Given that the production stages require investing in highly specific physical assets (e.g. toasters, grounding machines, etc.) only larger coffee growers and a few very well organized cooperatives of medium producers have undertaken such projects. However, further integration, (i.e. exportation) is undertaken by yet fewer agents because the management of international contacts is time consuming and bargaining costs for the country's output (which is considerably small in worldwide terms[6]) are indeed substantial. To conduct these activities agents have to invest considerable resources in gathering information and securing sales contracts.

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(c) Background of the Nicaraguan coffee industry (1950's to 1970's)

Prior to the revolution, large coffee growers had usually opted for a forward vertical integration of production and commercialization. In other words, many of them (in groups or individually) undertook all the necessary tasks to prepare the coffee grains for exportation and take their output to

[6] Nicaragua maintains a historic share of the world coffee supply in the range of 0.7-0.9%

ports. Medium and small producers often sold their harvests to the larger producers or private processors who usually even provided financial support as means to secure the purchase. It must be stressed nevertheless that small and medium producers could either finance their production within the coffee industry or through the financial system that had in general a strong preference for agro-exporters. The forward vertical integration decision in the industry was justified in terms of the higher asset specificity involved in both coffee cultivation and commercialization.

Looking into coffee growers' bargaining power before 1979, it is obvious that they had a privileged position in all core input markets. It could even be averred that in a sense transaction costs were actually being passed on to other agents, especially to rural workers in the form of reduced salaries; a situation that was partially reversed in the 1980's. In addition, the coffee industry during the years before the revolution had a very well coordinated network of providers who imported high quality fertilizers, herbicides and agricultural equipment and machinery. There were no hold-up problems or issues of scarcity because suppliers were certain that growers would purchase the necessary items to sustain high production yields since during this time period very attractive international prices were paid.

Throughout the 1950's, 1960's and 1970's the Nicaraguan coffee had a quality premium on price, principally in German and English markets. As a consequence it was not uncommon for coffee growers (particularly large ones) to obtain preferential prices provided they invested in higher technology and implemented more labor intensive growing and cultivation techniques necessary to produce higher quality coffee. Still during these years, the medium and small (more traditional) growers were facing international prices that portrayed a promising increasing trend.

It can be concluded that during El Somocismo (1936-1979) there was not any major hold up problem in the production and the commercialization of coffee. Payments were made on time and access to high quality inputs was guaranteed. But this was not only the case of the coffee industry alone but of most agro export industries in the country that had both economic and political support from the government's development agenda usually to the detriment of the staple crops sectors.

4. Case study evidence and implementation of the proposed framework: Discussion of empirical results

The Sandinista Revolutionary Government imposed a dramatic institutional breakthrough in Nicaragua. In the case of the coffee industry, the land reform, the introduction of technological and credit programs and the instauration of a state marketing board (ENCAFE) altered noticeably the standard exchange modes. In the next subsections however, only the transactions related to the labor and output market will be assessed under the light of the framework.

(a) The Sandinista Land Reform & rural labor

"The state or the workers could end your existence as a grower."

-. *Interview to Coffee Grower 05*

Before the Revolution, specialized coffee collectors did not have a remunerated salary. Still labor was abundant as many came from other Central American countries and other areas of Nicaragua for the coffee harvest season. However, when the Sandinistas seized power in 1979, the introduction of the Agrarian Reform Laws shifted dramatically the bargaining power of both seasonal and permanent rural working classes which led to the consolidation of an altered set of productive incentives for all agents in the Nicaraguan agrarian economy.

There were several decrees that supported an empowerment of the rural labor in a direct and indirect manner. The direct approach included open demands to improve the social conditions of peasants stationed in coffee farms during harvest and non-harvest seasons[7]. Certainly such dispositions inserted pressure for the coffee growers, yet, the true empowerment of the rural class was achieved with the introduction of various confiscation decrees and peasant participatory schemes. Specifically, the Sandinista Land Reform Law stated that in the coffee industry, any farm above 500 manzanas in the northern and central zones of Nicaragua or above 250 manzanas in the Pacific region was subject to confiscation and re-structure. However, any farm during the Sandinista Regime was subject to confiscation irrespective of its size if the owner was absent for more than six months; if the farm was being managed in an inefficient manner; if there was under-investment or asset stripping; or if there was a nearby community of landless individuals or if the zone was declared as strategic to the revolutionary goals. Such a set of conditions inevitably left a great scope for arbitrary confiscations without compensations of any kind which increased uncertainty levels for the propertied segment[8].

The confiscation decrees related to absenteeism and mismanagement[9] were highly subjective in the nature of their enactments for they required that insiders denounced the situation in a particular farm to the government. It was therefore not uncommon that the government would send labor union representatives to advise the rural workers on how they had to involve themselves in the administration of coffee plantations and report any "anti-revolutionary" practice. "At least once a week, there were open discussions with the workers of the farms so that they became more active in

[7] Claims were related to housing infrastructure, nutritional requirements, regulations on transport vehicles and agricultural equipment as well as sanitary conditions and educational facilities.
[8] A key problem with direct government confiscations is that these were based on unclear justifications. The usual arguments were a connection to the previous regime (however vague o sporadic it had been) or that a zone was determined as strategic to the revolutionary goals (usually, military or socio-economic reasons were stated). On top of this, there were no advanced notifications on whether a farm would be intervened and these usually took place from one day to the other. It was common that coffee growers would find out that their farm had been confiscated by reading it in the newspapers or by listening to a public speech of any important officeholder of the revolution. Additionally, there were contradictory messages from within the members of the Sandinista State who would disagree on whether a particular property had been rightly confiscated or not; but in the meantime lands remained intervened. Many of the interviewees expressed that they lived in constant fear of confiscation throughout the 1980's.
[9] Decrees 760 and 700 respectively of the Agrarian Reform Law (1981)

the management of estates and in the demands of higher living and social standards." *Interview to Coffee Grower 02*

Coffee growers perceived labor force demands as being artificially directed by the government in order to sabotage plantations making them subject to confiscation. In other words, from the coffee growers' perspective many of the social demands were regarded as ridiculous or impossible to achieve. But if the workers abandoned the farm, the land would be most certainly lost. Many union representatives were left in the rural areas to supervise these matters and sometimes a kind of popular trial was conducted where workers were asked whether they thought a particular landowner deserved or not to have his/her land confiscated or re-structured. Often the reply was that part of the farm had to be given to the workers along with monetary compensations.

The modifications to the policy environment and the supportive actions of the government altered the working incentives for the rural labor force who found they could threaten their employers with reporting them for inefficiency or under-investment thus increasing the risk of losing their plantations. Under these circumstances the dimensions of transactions in this market were seriously modified. There was scope for highly opportunistic behavior since rural workers were aware of their new bargaining status and used it in their favor. Private coffee growers concurred that basically their workers did whatever they wanted, increasing the level of uncertainty regarding land ownership and farm management. In other words, monitoring was simply no longer feasible as the nature of the labor contract itself had broken under the new socio-economic scenario. In fact, the standard rural employment contract became unenforceable because employers would not be willing to supervise nor demand labor discipline due to the fear of a possible confiscation from their own laborers. If before 1979 workers went to the fields at six am, during the Revolution they started by eight am and they

also finished a lot earlier (around 11am). This behavior was especially accentuated in state farms where it was not even possible to fire workers due to ideological principles. The average of hours worked per day in the fields shrank from six hours prior to the revolution to two hours and a half during the 1980's (Spoor, 1990, p 538). Clearly, the feedback effect was in the form of an open shirking that contributed greatly to the decline of yields in the industry.

The incentive structure not only gave way to shirking in the fields but also to opportunistic strategic actions beyond the scope of the traditional rural labor contract because if the properties were in fact confiscated these were turned into either state farms or cooperatives that were integrated mainly by members of the rural labor mass. In truth, the entire revolutionary process was threatening the viability of the property rights system as it had been conceived and implemented up to that time. It is not surprising that with the higher levels of uncertainty and opportunism regarding the continuity in land ownership and the inability to undertake cost-effective agricultural management due to the higher transaction costs of working with what was considered a subversive rural labor force, coffee growers consequently also altered their productive and strategic behavior.

In the face of increased costs of transactions with the rural labor, coffee growers changed their productive behavior by trying to substitute labor with other agricultural inputs. The standard reaction was to hire as little permanent labor as possible and to introduce more mechanized techniques to protect against plagues and to apply fertilizers. Put differently, they were really aiming to avoid frequent exchange in the market that presented the highest transaction costs from their perspective[10]. What this is suggesting is that a change in the distribution of transaction costs in the labor market also had an impact in the constitution of the transformation costs of the coffee farm. This new combination of technology was not the most efficient because to introduce any sort of machinery into

[10] One of the medium sized coffee growers interviewed indicated that he had reduced the number of permanent workers by half (from 80 to 43) by 1983.

the plantations required that the density of trees per manzana to be substantially reduced (almost by 50% as alternate lines of trees had to be cut down to form trails for tractors). Despite the obvious decrease in yields, this nevertheless seemed to be the most adequate solution (especially for larger growers) because if production was on the other hand all together suspended, not only would they never recover the original investment made to the coffee plantations but their farms would be automatically confiscated by the government.

Coffee growers' strategic behavior was also modified and the feedback effect was a dramatic one. Under the circumstances of unclear property rights and high uncertainty, coffee producers froze all major investment plans related to renovation or expansion and kept to the minimum level all necessary regular tasks to sustain moderate production levels. It is well documented that the majority assumed conservative and cautious business attitude which had a long term damaging impact in the industry (Colburn 1984). This negative effect is partly explained in terms of the nature of coffee cultivation. Once the coffee tree passes maturity levels (around 10 years after plantation) optimally it should be renovated. However, it was usual that growers would not compromise any additional resources to their farm. As one of the interviewees stated, "…after 79, we did continue tiling our lands, but the adverse attitude against growers… made us reduce our employment of technology and our yields decreased…" Many also reported to have operated with losses during the Sandinista Regime years[11]. *Interview to Coffee Grower 01.*

[11] Towards the middle and end of the 1980's the conditions of coffee plantations also suffered due to a shortage of skilled seasonal rural labor due to the escalated intensity of civil war in the Honduran borders. Inexperienced collectors from the cities (mainly university students) were brought by the government to the fields during the harvests months. In the interviews it was recorded that the people that picked up coffee during the Sandinista Revolution did not know how to do it properly. They used to break the tree because they rubbed the branches when collecting the fruit thus hampering future harvests. One of the interviewee stated: "We tried to train them telling them only to pick the red fruit but while some were motivated others were not. It was a mess, they damaged coffee plantations".
The military recruitment process also imposed other costs on coffee growers. If a worker was recruited, he or she had to continue receiving his/her farm salary. It could be argued that this loss was compensated by the government's attempt to guarantee seasonal labor give the shortage of labor. However the substitution was not perfect and it had efficiency costs.

To summarize, there was the threat of confiscation from the government and the rural labor force which paralyzed private investment plans and on the other hand there were increased transaction costs in the internal management of the farms. Supervision, monitoring and enforcement costs were all out of proportion as the traditional labor contract became unenforceable. Along with the increased transaction costs in other key inputs markets (agricultural equipment & fertilizers), a substantial modification of the coffee farm structure took place. This process will be discussed after exploring the alterations to the output market in the Nicaraguan coffee industry.

(b) ENCAFE & coffee output

The Sandinista Government wanted to make structural changes to redistribute wealth and resources in the agrarian economy. One of those structural changes included the nationalization of foreign trade and the creation of a marketing board: ENCAFE. These measures directly affected the financial interests of coffee growers who were unenthusiastic to the implementation of such system.

The ex-director of ENCAFE expressed that the main objective was to guarantee stable prices for coffee producers and create a stabilization fund. The price of coffee was calculated by the Ministry of Agrarian Reform and it was based on an estimation of production costs. In theory the fixed price was set so that a profit margin of 10% to 15% could be obtained. The difference between the international price and the fixed price was to be transferred to a fund so that whenever the international price declined the same fixed price could be sustained. In other words, the government was offering a sort of insurance mechanism to procure a steady income for the growers in the Nicaraguan coffee industry. It may be argued that there was a transaction costs savings rationale in this government plan since the costs related to risk reduction activities in the marketing process could be virtually eliminated for all producers. The marketing board became thus a monopsony that was also in charge of collecting,

classifying and selling the Nicaraguan coffee abroad. There were around 70 agencies throughout the coffee cultivated areas and the growers had to assume the costs of transporting their output to such centers of collection, but not any other costs related to searching for trading partners and the corresponding costs of enforcing contracts or correcting for ex post misalignments.

By controlling the country's coffee production (which at the beginning of the 1980's was on average 1.5 million QQ) it was expected that the international bargaining position of ENCAFE would be strengthened. In some cases, countries supporting the Revolution would purchase the coffee at a premium price. In addition, there was scope for scale economies gains to be materialized since the shipment of large quantities of coffee justified the purchase or rent of carrier ships that could bring back key inputs for the industry. In other words, the profit of performing these transactions previously captured by coffee growers' private elite (who could afford to invest in the setting up of these forward integration activities) was to be captured by the Revolutionary State during the 1980's. It could be argued that the government imposed a trade off. Private producers no longer had to undergo any of the transaction costs related to marketing or risk reduction plans due to varying international prices; but in return they also had to settle for a reduced price and a maximum ceiling in terms of potential profits' margins.

In general, these marketing policies provoked a negative reaction from the private sector in the coffee industry. They used to complain about the lack of competitors to ENCAFE. But there were strong pressures from the government to absorb all foreign currency inflows to the country as they were in the middle of an expansionary fiscal policy program in various spheres (not only social but mainly military) that led to high and unsustainable inflation levels and overvalued exchange rates.

Although growers did not experience any uncertainties about selling their output since no searching costs for a trading partner were actually present, it was the lack of financial incentives (in terms of a reduced price) that had a tremendous detrimental impact. When the government was undertaking the activities previously done by the private sector, it only implied that the earnings from such transactions were being absorbed instead by the Revolution. Two main aspects created great upset among producers. One was the mechanism related to fixing the price for coffee and the other one concerns the payment procedures and regulations of coffee reception. Together these practices increased the level of transaction costs for coffee growers in the selling of their output while simultaneously reducing further their earnings.

i. Price policies

The fact that there was a maximum to what could be earned independently of any efforts introduced an immense disincentive in production. And even when part of the payment was made in dollars (three to five US dollars per QQ) to compensate for escalating inflation and overvalued exchange rates[12]; producers were not motivated to expand their output. The government had hoped that by introducing a percentage of the payment to coffee growers in dollars (that were essential to purchase agricultural equipment), the declining trend of the industry could be reverted. Yet in the interviews conducted to coffee growers, a strong consensus was evident when discussing the price levels imposed during the Sandinista Regime. "If they had paid the true prices the coffee plantations would not have been deteriorated" *Interview to Coffee Grower 10* -. This argument was based on the premise that the fixed price was eroded by inflation and it was insufficient to sustain production.

[12] Macroeconomic Indexes 1980-1989

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Inflation (%)	24.3	23.2	22.2	32.9	50.2	334.3	747.4	1347.3	33603.0	1689.1
Official ER	10.0	10.0	10.0	10.0	10.0	28.0	70.0	70.0	920.0	38150.0
Black Mkt ER	18.7	39.0	80.0	170.0	450.0	1000.0	3200.0	35000.0	5500.0	50000.0

Source: Spoor (1993; p 638)

During the inflationary process, the government refused to devaluate and all producers who faced price controls were absorbing higher costs and not obtaining any higher revenues. In the case of agro-exporters, the exchange rate was overvalued and profit levels were seen as unacceptable to cover production costs which eventually contributed to the generation of political tensions. Without secured or enhanced profits, incentives to renovate coffee trees and increase yields were not really present. Stated differently, the feedback effect of this price policy was in terms of reduced investment.

During this time period, access to the actual international price was limited. Yet it was known that the International Coffee Organization had a band of prices between 120 and 140 and Nicaragua was in their quota system. A growing resentment from private coffee growers was inevitable since they perceived the government as a highly opportunistic agent[13]. The change in the degree of uncertainty and opportunistic behavior between both trading partners is more obvious in the implementations of coffee reception and payment procedures.

ii.Reception and payment procedures

Coffee growers had to take their coffee (either as cherries or grains) to ENCAFE agencies where government technicians evaluated and determined the quality levels. Depending on the number of imperfections found, a penalty was imposed. The deductions from the fixed price were not clearly defined in advance and the uncertainty regarding the final price was considerable. In effect, such penalties became a very discomforting factor and as a result individuals usually tried to alter the weight of their coffee by bringing the cherries wet or by adding weight to the bags of grains. These maneuvers were also known by the representatives of ENCAFE who were even stricter in their

[13] "And they were so lucky because the coffee prices were never below 150 dollars per QQ during the 1980's. There was a peak in 1986, where it reached 200 dollars but we only got around five or two dollars per exported QQ…" *Interview to Coffee Grower 04*

imposition of fines which ultimately only worsened the degrees of trust and increased enforcement costs.

Another problem was that growers did not receive payment immediately after delivering their coffee. ENCAFE payment procedures were troublesome to say the least. They emitted a crossed check in favor of the National Bank of Development so that any credit would be automatically paid for and the rest was deposited into the coffee producer's account. Only after a few months (two to three months) were the complementary payments received. But the real problem was not the delay but the fact that it was assured if the money was really available. In other words, there was an uncertainty of whether the bank had cash to make the withdrawals possible. Then it was problematic to pay both permanent workers and coffee collectors and to purchase any agricultural inputs, not mentioning agricultural machinery. One interviewed coffee grower summarized it like this: "…to sustain the farm you really had to put back everything you were paid and still it was not enough." *Coffee Grower 06*

According to the policy makers, many of the coffee growers did not understand the government's approach and only saw it as a control mechanism. The reduction in prices was seen as a political measure to suppress any opposition from a segment that historically had been very powerful. An element of hysteresis was at work since private agents did not assimilate the nature of the revolutionary system. Basically, they were used to undertake the risks of their industry and were reluctant to adopt the procedures of a planned economy that limited earnings since ENCAFE was absorbing a higher percentage of profits. Before, when the private sector undertook the commercial transactions a higher profit margin was kept; ultimately this suggests that the new governance structure imposed to administer all marketing transactions had actually passed on higher transaction costs to the coffee growers instead of reducing them.

Additionally, many coffee growers complained that the new government enterprise lacked knowledge specificity and the incentives of the private sector to innovate and capture higher profits. In the interviews it was stressed that ENCAFE used to mix different qualities of coffees reducing overall quality; while further reducing the incentives of private agents to process their output into grains since the fixed price would not justify the maintenance of the relevant governance structures to direct such productive activities.

The feedback effect was therefore strong and dramatic. In the attempt to preserve a profit margin level similar to the one experienced under El Somocismo, but in the face of lower prices and higher transaction costs, producers tried to lower their internal production costs (by decreasing labor and the purchase of inputs and equipment) which led to a decreased output level. As output declined, average transaction costs only increased.

(c)Corollaries for intra-firm structure and industry performance

It will be argued in this section that the change experienced in the Nicaraguan coffee industry was molded substantially by growers' reactions to increased transaction costs which emerged under the Sandinista Regime. Prior to the Revolution, the coffee industry had expanded its cultivated area by approximately 20% between 1960 and 1979. Simultaneously, an increase of more than 50% in production levels (from 570,000 to 1,415,000 QQ) was recorded. In the ten years of Sandinismo however, the cultivated area declined from 140,000 manzanas to 99,000 (approx 31%) and output shrank from 1,200,000 QQ in 1980 to only 769,000 QQ in the mid 80's and a slight recovery took place towards the end of the 1980's of approximately 980,000 QQ (MAGFOR, 1990).

Many have claimed that it was the military conflict that led to stagnation in the coffee industry. However two facts offset such argument. First, the armed confrontations were confined to specific geographical zones close to the Honduran borders. Second, by the end of the 1980's when the war intensity escalated a slight recovery in coffee output was reported. This recovery coincides with a short-lived attempt of the government to devaluate the currency, increase agricultural investment expenditure and return some state farms to their previous owners. It would nevertheless be completely wrong to suggest the war had no impact in the coffee industry, but it should be stressed that it affected this industry in the same way it affected other productive sectors in the country outside the actual geographical conflict zone; especially through exacerbating labor scarcity and hindering the distribution and access to other inputs.

In the previous sections, evidence of transaction costs emergence in the labor and output markets of the coffee industry and the consequent feedback effects were discussed. Now, their overall impact on re-shaping coffee cultivation in Nicaragua will be analyzed. As stated, transaction costs were increased in the form of higher supervision costs and unenforceability of the rural labor contract. They were increased with the imposition of technological regulations in the management of farms, and throughout the commercial relations with ENCAFE.

Different types of coffee growers implemented different strategies to handle the increased transaction costs levels. Their responses depended on their size or more precisely in the relative amount of their initial investments which is a reflection of their financial status and degree of asset specificity. Large and high medium producers, who were better off, managed to alter their technology and substitute labor by agrochemicals or rented equipment in order to sustain moderate production levels. In other words, they altered the ratio of factors of production so that fewer transactions were undertaken in the

market that presented higher costs to conducting an exchange (i.e. rural labor market). For low medium and smaller producers who usually employed mainly labor; such a substitution strategy was less feasible. As a result, these agents that had smaller plots of land opted in the first instance to diversify into other economic activities and eventually abandon the industry when profits had considerably eroded.

Diversification could be seen as a strategy of partial exit from the industry. As it has been explained, the high asset specificity of coffee production imposes high exit costs. This strategy was based on the aspiration to obtain higher profits in alternative economic activity and escape the constraints imposed in the coffee industry without completely abandoning the hope of recovering the initial investments. Growers diversified into producing whatever they knew more about. In the interviews conducted such crops included: citric fruits, staple crops and cattle which are all relatively highly re-deployable investments.

The case was different for high medium and larger producers, who were likely to be more attached to their investments in coffee cultivation and less inclined to experiment in other areas. In addition, for them a trade off and a re-accommodation in the use of factors of production was possible. Most of them adapted their technology so that transformation costs could be reduced and a marginal profit similar to the one they were used to could continue (at least in the short run) to be obtained despite the increase in transaction costs. The reduction in the transformation costs took the form of a reduction in manual activities related to shadow control and fertilizations. All renovation plans were frozen and activities related to the processing of coffee after harvests, were also reduced since the governance structures related to marketing activities were dismantled with the institutionalization of ENCAFE. This was a clear effort to minimize those costs that were still under the control of the entrepreneurs while absorbing the higher transaction costs that had evolved with the new macro-policy environment.

In fact, there seems to be an implicit, not fully explored relationship between transaction costs and transformation costs. Transaction costs like standard production or transformation costs can be divided into fixed and variable components. Naturally the proportion of fixed and variable transaction costs will vary according to the nature of the factor of production and transaction dimensions. For instance, in coffee farms, variable transaction costs are higher for labor than for fertilizers (i.e. labor supervision costs increase with the number of hired workers. But transaction costs are invariant whether growers buy 100 or 1000 kilograms of fertilizers.) In the Nicaraguan coffee industry, transformation costs are nominally higher for larger coffee growers due to the employment of more labor. However, in pre-revolutionary Nicaragua, larger coffee growers could sustain high ratios of labor and fertilizers because of the increasing trend in international prices that enlarged profits and the low salaries of the rural labor force and the guaranteed access to high quality inputs[14]. Additionally, accessing credit involved less transaction costs for a larger producer during the Somoza Regime (1937-1979). It can be stated that the movement or change in technology throughout the 1980's represents an attempt to escape the enhanced transaction costs that emerged in the different markets with the introduction of new policies that affected the bargaining positions of all trading partners. Equally, under the Sandinista revolution, the level of threat for confiscation was notably higher for a larger coffee grower; though medium and smaller ones also expressed such a fear. A key conclusion is that when transaction costs increased coffee growers (of all sizes) tried to reduce transformation costs in the hope to safeguard profits and it was such a disposition that led to the decline of yields in the private Nicaraguan coffee industry as depicted in Figure 4.

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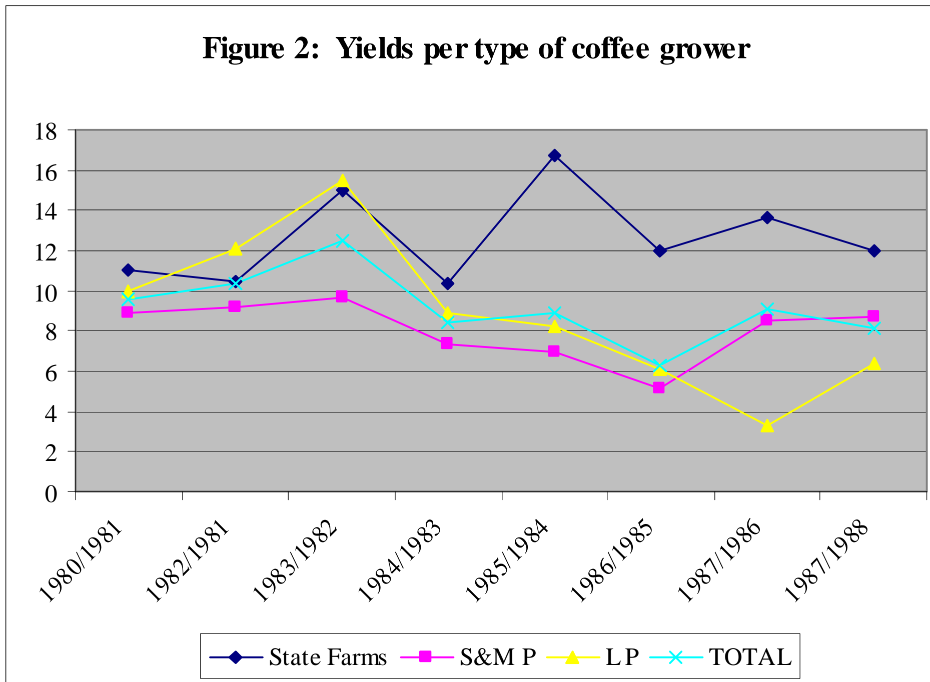
[14] A government agency (ENIA: Empresa Nicaragüense de Importación Agropecuaria) was in charged of purchasing inputs abroad and distributing them domestically. With the U.S. Economic Blockade in 1984, the inputs to which the coffee industry had been familiar with were no longer easily available. The revolutionary government had to substitute them for Latin American or Soviet Union products of lower quality and it was common that mixes of generic agricultural components had to be improvised within the country.



Source: MAGFOR, 1990

There was also a de-verticalization in the industry. Many large and efficient coffee growers who had usually opted for forward integration in the coffee industry were confiscated so that the Coffee State Farms could be formed. For the private sector that remained, the lower expected profit reduced the incentives for coordinating production beyond the harvest stage. It could be claimed that during this time period, agents became more atomistic, and only aimed at protecting their asset specific investment, by undertaking the minimum level of maintenance tasks. Gains from forward integration and specialization in marketing activities were no longer obtainable for the private sector thus further contributing to stagnation in the industry.

5.Conclusions

Douglass North in his book "Institutions, Institutional Change and Economic Performance" (1990) argued that the institutional environment (via incentives and transaction costs) determines what

activities will be profitable and which will not thus defining path dependencies. The change in institutions also affects transformation costs because it makes certain types of technology more or less efficient. Both statements find empirical support in the case of the Nicaraguan coffee industry under the Sandinista institutional environment. The introduced transaction costs framework exemplified how policy changes altered relative prices in the inputs markets and inserted an entirely new distribution of transaction costs which affected not only the technology employed but the investment plans of economic agents and their strategic behavior. The interviews of this case study revealed how the Sandinista government altered coffee grower's transaction costs through both their inputs and output markets by shifting bargaining powers which also gave way to feedback effects that modified the end results of the revolutionary policy enactments.

The main problem in the Nicaraguan coffee industry was that the imposed governance structures (especially in the output market) were not the most efficient in terms of economizing on transaction costs. As Williamson has stated, transaction cost analysis entails an examination of the comparative costs of planning, adapting and monitoring task completion under alternative governance structures (1996, p 58). During El Sandinismo, marketing mechanisms increased transaction costs for coffee growers simply because it was accompanied by frequent misunderstandings, conflicts that led to delays, breakdowns and malfunctions which made parties to the exchange operate inharmoniously (Ibis). Yet a key advantage of the conducted analysis is that it enables us to assess the evolution of transaction costs emergence and impact from a far less static approach. Explaining why the industry experienced such a dramatic change in its rising historical trend of production. In conclusion, the stagnation of coffee production in Nicaragua during the 1980's is based on the re-structuring of the industry and the attitude undertaken by the private producers in a revolutionary policy environment that dramatically distorted incentives and transaction costs.

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