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# Collective Efficiency: *MEZCAL* Production and the Clustering of Small Firms

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## 1 Introduction

During the past decade, the Mexican economy has gone through a stage of unprecedented change accompanied by thoroughgoing transformations at the societal and political levels. These dramatic changes are undoubtedly related to the complex interplay between the major restructuring of world markets and the concurrent upsurge of neo-liberal policies on a worldwide scale. In Mexico, this transition parallels similar processes presently taking place in core Western economies. To mind come the rapid and radical changes in production technology and industrial organization of some key sectors and the ensuing changes in economic management policies at international (NAFTA, GATT), national and regional levels. Other examples would include the rise of new produc-

tion spaces in hitherto unindustrialised areas; forms of regional development not any more based on Fordist mass production techniques; the relative expansion of manufacturing activities based on less rigid and more highly adaptable (i.e. flexible) technologies. Other, less virtuous transformational effects are the socially speaking costly processes of de-industrialization and decline of some manufacturing regions and the virtual collapse of smallholder agriculture.

Analogous to these trends is the enormous growth of small-scale enterprise in urban and rural areas. As a response, the Salinas Administration launched a number of large-scale programs that pretended to increase the competitiveness and productivity of the micro, small-scale and medium sized enterprise sector. In fact, the most important government programs under the Salinas administration concerned the creation of alternative income possibilities<sup>1</sup>. With the new policy the government expects this sector -by far the largest employer- to contribute to industrial reconstruction, especially because small-scale enterprise promises to adapt flexibly to the new conditions of international competition.

Considering this situation, it is remarkable that the research community has been slow in responding. Although there is a good deal of literature on the subject, there is a particular dearth when it comes to understanding small-scale economic activities from new, promising perspectives. One such perspective is that offered by innovative work on 'flexible specialization' in advanced countries (Piore and Sabel 1984). In a nutshell, flexible specialization may be defined "as a technological paradigm or ideal-typical model of industrial efficiency: the manufacture of specialized goods using flexible machinery and skilled labour" (Hirst and Zeitlin 1991:2). The model was used by Piore and Sabel to contrast it to Fordist mass production in which mass goods are produced using standardized machinery and unskilled workers. The concept of flexible specialization has been used in the context of the debate on industrialization in the heart of capitalism itself, particularly in small firm industrial districts of the Third Italy (Becattini 1989; Brusco 1990), Germany (Häusler 1992) and Japan (Dohse et al 1986), where small enterprises have shown their economic strength in times of crisis. The general argument is that the strength

of small-scale enterprise there cannot be comprehended by examining individual firms. Rather, their vitality lies in clustering and cooperative competition, the effect of which is shown by an increased ability to adapt and innovate.

It is not the aim of this paper to discuss the at times elusive model of flexible specialization<sup>2</sup>. However, I will borrow two instruments from its conceptual toolbox - 'clustering' and 'collective efficiency'- in order to explore their potential contribution in understanding the role of rural small-scale enterprise in the regional development of underdeveloped economies. Using both concepts, in the next pages I will illustrate one instance of regional development in the State of Jalisco in Western Mexico that has recently been fuelled by a number of firms engaged in the production of mezcal (a distilled spirits made from agave). I argue that the relative success and expansion of these firms in the otherwise "poor" agricultural landscape can best be understood by the efficiency and flexibility gains ensuing from their sectoral and geographical concentration. Although such opportunities do not necessarily follow from clustering, geographical and sectoral concentration in this case

encourages inter- and intra firm division of labour as well as product specialization; the appearance of input suppliers and parties providing new and second hand equipment and spare parts; a rapid supply of products on short notice; the arrival of distributors willing to sell in both national and international markets; specialized financial and accounting services; and the emergence of a pool of skilled labourers.

In the next two paragraphs, I will provide a short overview of the intricacies of mezcal production against a historical background. In order to support my argument, in the third part I furnish some evidence of the efficiency and flexibility gains resulting from the webs of inter-firm linkages between mezcal producers. This is followed by a brief statement on the importance of borrowing the concepts of 'collective efficiency' and 'clustering' from the flexible specialization approach in light of more general issues of regional development in Third World contexts.

## 1 Mezcal - historical overview<sup>3</sup>

There are no records of the existence of distilled spirits in prehispanic Mexico, and there is widespread agreement that the process of distilling already fermented beverages such as mexcalli or vino mezcal (made from the heart of the mezcal agave) was introduced by the Spanish conquerors in the early 16th century. At the beginning of the 17th century some hacendados in the immediacy of Guadalajara were known to produce distilled mexcalli for their own and their labourers' consumption. However, it is not until Guadalajara becomes a regional center (around 1650) that vino mezcal is produced for commercial purposes. From the Conquista to roughly 1650, producers, traders and consumers of vino mezcal had to put up quite a fight against a series of prohibitions and restrictions that ranged from hefty fines, to jail sentences and even the death penalty for whoever was found drunk upon arrival at certain colonial cities. The latter was the case in the city of Colima and some districts of the coast of Jalisco and Southern Nayarit where early colonialists were engaged in war with the Colimotes whom they tried to "pacify". Despite the penalties, evidence suggests

that from the middle of the 16th to the middle of the 17th century, vino mezcal was being produced at an ever larger scale. Most consumers were neo-Galicians and criollos for the local population liked pulque<sup>4</sup> better. By then -probably for tax reasons- a legal break for both producers and consumers of the well-liked beverage was provided by creating an estanco<sup>5</sup> in which all liquor entering the gates of Guadalajara had to be sold. Many municipalities, however, protested heavily to this measure because the estanco was the only one in New Galicia -a centralizing move that effectively prevented these places to levy taxes<sup>6</sup>.

The actual boost in the production of vino mezcal, however, does not take place before the start of the 18th century when the northern part of Sonora, Baja and Alta California were "pacified" and opened to colonization by the jesuits Kino and Salvatierra. Slowly a market developed, with Guadalajara as the natural supplier. This market grew significantly after 1767, when all jesuits were expelled from the Castilian Empire and opportunistic friars such as Junipero Serra expanded the Spanish and Franciscan jurisdiction all the way to San Francisco. Trade increased by the

middle of this century between New Spain and the Philippines, with both Acapulco and San Blas (Nayarit) as important harbours for valuable goods in transit to Veracruz and Cádiz in Spain. These developments certainly opened new windows to the world for Guadalajara, and by 1800 the city was a major trading center communicating the Philippines, Upper and Lower California as well as Northern Mexico with Spain. A further boost for trade in Guadalajara occurred during Independence War (1810-1821). The leader of the insurrection, Morelos, dominated the Southern coasts of Guerrero, and all Eastern commerce was detoured from Acapulco to San Blas.

Vino mezcal became an important byproduct of this trade. Especially those Alcaldías where the liquor was produced and that lay on the trading route (Tequila, Amatitán, Ahualulco) fared very well. The vino mezcal from this area also became widely known in Mexico City, where it was preferred over cheaper vinos mezcales from Oaxaca and San Luis Potosí. Willing to profit from tax revenues, the colonial Administration opened two more estancos in Sayula and Colima, both on the road to the alternative harbour of Manzanillo. The

vino mezcal in these cities, however, came from the relatively nearby towns situated in the region of "El Llano" (Tonaya, Tolimán, Tuxcacuesco and San Gabriel). In time, vino mezcal reaching Guadalajara and Mexico City became known simply as "Tequila" -its place of origin. Similarly, in Colima vino mezcal was (and is) known as "Tuxca" (from Tuxcacuesco) in the vernacular. In other areas vino mezcal is simply called mezcal<sup>7</sup>.

Mezcal never profited from an expanding market the way tequila did. Because of the remoteness of their location - which in some cases lasted until well into the twentieth century- mezcal producers never manufactured much more than was consumed in their haciendas. The secret of distilling was passed on from father to son, to the extent that even nowadays most producers are directly related to the former latifundistas. With the exclusion of the producers from Tuxcacuesco, mezcal rarely passed the gates of the hacienda and, probably because of the scarcity of it, this mezcal soon acquired the reputation of being of exceptional quality. It is still recalled that traders (arrieros) were awaited with great expectation in Sayula, Zapotlán (now Ciudad Guzmán) and Colima if it was

known that they had paid a visit to one of these haciendas. Commercial production, however, took off only recently. There may be many reasons for this, but two are the most commonly expressed. The first involves the appearance of bogus producers who, perceiving the great demand for the product, started fabricating cheap, bootleg imitations of inferior quality. Customer dissatisfaction was the outcome, and the market collapsed. Another reason often cited was the construction of the Guadalajara-Autlán road in the 1950s. Traffic between these two cities used to pass through Sayula and Ciudad Guzmán which were relatively close to El Llano. As the new road was built over Autlán to the West, old and regional trade centers such as Sayula and San Gabriel (the gravitational centers of the El Llano communities) lost their relative importance. With them, the local mezcal market also diminished.

This situation was altered when a new, paved road was built between Autlán and Ciudad Guzmán in 1974. With the road, local caciques (who intensely objected against it) lost some of their power as the local population of these isolated areas was suddenly able to buy cheaper agricultural inputs and obtain higher prices

for their products. This meant more cash in these communities, which in turn had a positive effect on mezcal demand<sup>8</sup>.

### 3 Mezcal - the production process

Mezcal production has since expanded enormously, and presently the product is sold in both national and international markets<sup>9</sup>. On first sight, mezcal seems to be a quite straightforward product to elaborate, with a low entry threshold for would-be producers. In principle at least, mezcal is obtained from the agave plant. The plant material is harvested after a growth period of some 10 years (jima). Once harvested and undone of its long, pointed leaves, the mezcal hearts are transported to the distillery (taberna), where they are piled into a crater-like hole in the ground which is half full of burning charcoal covered with stones. The hearts are then covered with earth and allowed to "cook" slowly (72 hours) in order to convert its sour juices into sugars. Once uncovered, the plant material is threshed in a mill and the fibrous material (bagazo) is left to ferment in a tub for around 6 days. The

brownish, fermented liquid is then boiled in a cauldron and distilled through a still (alambique). After distillation the liquor can be aged in oak barrels to obtain a better taste, bottled and sold.

What seems to be a relatively straightforward process, however, incorporates an extremely complex blend of decisions that can be taken at any point of the production process. For example, the growth period of the agave can be shortened without quality losses through the use of fertilizers or by a careful selection of the soil<sup>10</sup>. The first possibility entails higher production costs; the second option entails a very wide network of ejidatarios and pequeños propietarios owning land of differing soil conditions and willing to rent or sharecrop for a relatively long period of time. A third possibility is to buy plant material from Los Altos and Tequila<sup>11</sup>, which in turn presupposes the right connections for agave demand is higher than supply. Decisions affecting the quality of the final product surface over and over again: fermentation can be boosted through different means<sup>12</sup>; the amount of the final product can be increased by adding 96% alcohol to the boiling cauldron; taste can be altered with both natural and chemicals

compounds, and so on.

In fact, these crucial decisions have in common that they are based upon a specific, localized knowledge of the technical, socio-cultural, political, economic and ecological elements involved. This body of knowledge, which in the end is traduced in a specific form of enterprise organization, is clearly not open to just anybody. Hence a relatively small number of producers are presently concentrated in a relatively small geographical area that comprises the municipalities of El Grullo, Tonaya, San Gabriel, Tuxcacuesco and Tolimán. Out of a total of 27 producers, 21 have operating permits and 6 distil mezcal illegally (that is, they are not registered). Apart of these producers, there are some 5 to 10 resellers who "baptize" most of the mezcal made by illegal producers (and some of the legal ones) by bottling the product and providing it with their own sticker. Most producers make more than one brand of mezcal, and each brand is offered in a variety (three to five) of "qualities" and prices. The size of the enterprises, as well as their output, varies greatly: whereas the owner of the smallest illegal distillery obtains 200 liters of mezcal every so many weeks and employs only one

casual labourer for harvesting, the largest firm has an output of 30,000 liters a week and 58 labourers on the payroll (most of them women at the bottling and packaging plant), not including 3 secretaries, a lawyer and an accountant. Three producers are presently exporting mezcal, and others are willing to join the lucrative export market as well<sup>13</sup>.

#### 4 Collective efficiency

A casual conversation with a mezcal entrepreneur would indicate a sector in which harsh competition, hostile jealousy and backward mentalities are commonplace. So, for example, it is not uncommon to hear entrepreneurs complain about the 'traditionalist spirit' of fellow producers who mix up all sorts of business (including their distilleries) with family matters and hence seriously constrain the development of the sector. Gossip is also out that the mezcal fields of one of the bigger producers was set afire by an envious competitor only some months ago. Producers consciously hold this revanchist attitude as responsible for blocking the unity so much

needed to lower fiscal, financial and marketing risks eg. through direct, collective negotiation with Hacienda, banks, or wholesale purchasers. This lack of solidarity is also blamed by some as the prime reason for the sometimes enormous quality variations which, in turn, are potential causes of customer dissatisfaction.

Yet, a closer look reveals that quite the contrary is the case. Indeed, the circumstantial association of mezcal producers that is derivative of their sectoral and geographical agglomeration has brought into being a developmental process characterized by progressive externalization of production and distribution. Whereas the "traditional" producer tried to keep direct control over his business by offering only one product, owning his mezcal fields, utilizing self-made implements and machinery and having his own distributors, today producers tend to specialize and fragment the production process. So, for example, specialization is evident by the fact that producers -most of whom engage in a number of other, unrelated agricultural activities and animal husbandry- are selling their grazing and arable land as well as their mezcaleras (agave fields). This strategy has allowed producers to invest

in the modernization of their distilleries<sup>14</sup>. As a consequence of this land-use modification, new rent contracts as well as changing labour and sharecropping relations are emerging between mezcal producers and ejidatarios with formerly idle communal land. Apart of this type of specialization, all distillers have diversified their products in terms of appearance, quality and price, thus catering for different types of consumers in different markets. In their quest to reach new consumers, some distilleries have recently started producing two, three and even four different brands of mezcal, with each brand coming in different price (and quality) ranges.

The fragmentation of production has gone hand in hand with a technical and sexual division of labour at the inter- and intra firm level. With the exception of some illegal distillers who perform all productive and distributive tasks themselves, all mezcal firms have separate distillation, bottling/packing and distribution units, while the larger firms also have their own plantation and administrative departments. But for the small illegal ones, all firms employ skilled, unskilled and semi-skilled labour. Skilled personnel is contracted for administrative tasks and spe-

cialized workers manage the actual distillation process; semi-skilled work is utilized for the *jima* (harvesting) of agaves and the distribution and selling of mezcal; unskilled labour is used mainly for bottling and packaging purposes. The latter, with few exceptions, are women. On-the-job training is provided only in the administrative and distillation departments, while semi-skilled work is learnt quickly by casual labourers accompanying more experienced ones. Upward mobility does exist, but is confined to the skilled and semi-skilled categories. Unskilled labour is generally contracted on a casual basis, and only few of them enjoy any social benefits (social security, SAR<sup>15</sup>, INFONAVIT<sup>16</sup>).

The collective gains of an inter-firm division of labour can be exemplified by the fact that producers may buy mezcal in bulk from one another when, for a variety of reasons, they cannot meet consumer demand. The flavour and the alcohol content of the unbottled liquor is then "corrected" by mixing it with their own or by adding artificial flavouring, alcohol and water to it. Then it is bottled and provided with the brand name of the end producer. Clearly not all producers engage in this practice. The larger manufacturers help

each other out only when there exists a good relationship, but smaller ones (as well as all illegal distillers) partly derive their right to exist through their specialization as *maquiladores* (contract distillers) for one or more of the larger firms. This incipient division of labour between larger and smaller enterprises also benefits the latter. Larger producers, for example, may buy a truckload of jerrycans of 96% alcohol at wholesale markets to be used later in the mezcal distillation process. Although they may not need all of the alcohol at once, buying in bulk is advantageous to them because it lowers transport costs. Small producers in turn buy modest quantities from them (5-10 jerrycans) and end up paying a much lower price (sometimes as much as fifty percent) than they would if they would stock with local merchants. Other, more "illegal" forms are also employed, for example when a large customer asks a distributor of brand X to bring along a certain amount of the competitor's mezcal on his next visit. In order not to disappoint the customer (or not to give away his location by placing the order directly with the competitor), the distributor may pass the order to his boss. The producer then "steals" some stickers from the competition (by ask-

ing, for example, a female employee to procure them through a sister or a relative bottling for the competitor), gums them on his own plastic bottles (which are of standard size and form), "corrects" the taste according to his notion of what the competitor's mezcal tastes like, and delivers. One and the other have the effect of creating a productive structure from which all profit, and in which the delivery of mezcal in near and far away markets can be met at short notice and at great speed.

Together with this division of labour and product specialization, mezcal production by these clustered small-scale enterprises has seen the emergence of networks of suppliers of raw materials, intermediate products, and producer services. So we have, for example, middlemen selling agaves from the Tequila and Los Altos region. Taking advantage of the presence of many producers concentrated in a relatively small geographical area, these middlemen do not risk being left with an unsold perishable product since they have the virtual certainty of there always being a buyer. This, of course, lowers costs for mezcal producers who would otherwise have to pay for individual transport of agaves. Other important suppliers include

three specialized water purification factories of El Grullo which, having soft lime water ideal for the fermentation process, send daily tankers to neighbouring Tonaya and Apulco at a fraction of the cost involved for an individual producer wishing to dig deep wells 500 feet deep. Similarly, there exist different producers of plastic and glass bottles catering specially for the mezcal sector. Here too, distillers profit from relatively low prices as a consequence of the economies of scale involved for bottle producers able to plan ahead and send only full containers. Likewise there is the emergence of a supportive network of specialized producer services. The list of services includes specialized repair and maintenance shops, accounting offices, fax and photocopying facilities, notary public, business and financial planning, legal advisors, and tax and financial services. These services, which are often shared, would otherwise be unaffordable for the smaller firms.

A related advantage of clustering is that it encourages a quick diffusion of innovations, know-how and skills. The distillation process, for example, has evolved from a relatively straightforward design in which vapours emitted from the wood-fuelled copper cauldron condensed against

a wooden plate hung above it to collect the mezcal, to more technologically refined propane boilers serially connected to stainless steel fermentation tubs through automatic bypass valves, stills and a complicated set of filtering devices. Although not all distilleries are equally developed, know-how and the skills necessary to operate the more sophisticated machinery are widely available. This is so, in the first place, because the diffusion of know-how and skills is directly related to an external agent: the highly technified producers of tequila. As I mentioned before, mezcal and tequila are nearly identical products, and innovations in one productive sector quickly find their way into the other<sup>17</sup>. Diffusion is facilitated by the fact that most personnel in charge of managing the distillation process has had prior experiences working with tequila companies. In the second place, successful innovations are quickly appropriated by others either through direct advice from the original developer, by way of gossip, or through the continuous switching of distillery personnel from one producer to another. The quick diffusion of innovations, know-how and skills -apart from reducing the technological gap between firms- effectively in-

creases the ability to react to market changes. For example, when two years ago sales of quality mezcal plummeted, one producer quickly reacted and successfully started selling his liquor in the same bottles he was using for export purposes. Within a year, five fellow producers bought second-hand, rudimentary bottling machines and multiplied the sales of their quality mezcal as well.

What has been said earlier (division of labour, specialization etc.) about collective efficiency is not the automatic outcome of mezcal firms being clustered. Running through this process of development are sets of social relationships between producers and their workers, distributors, suppliers and formal institutions such as ejidos. Equally, the inter-firm linkages that conform the cluster owe their existence to relations among producers -some of whom are compadres or relatives. In more theoretical terms, these specific networks of actors provide the conditions for a productive model that is very similar to what Piore and Sabel identified as flexible specialization. However, Schmitz (1990), in the context of a critical appraisal of Piore and Sabel's concept, asserts that what makes their model tick are institutional factors at

the local and macro level. These institutions, and especially local government, provide a proper environment for the industry in question and are regarded as essential to the flexible specialization model by directing competition towards innovation -a condition that is generally not met in LDC's. Indeed, in the case of mezcal the expansion of production through collective efficiency owes little to local or extra local institutions as such. In fact, the institutional environment has not been supportive but rather discriminatory. On the macro side, for example, we have that import substitution long maintained closed markets, thus increasing the price for a number of inputs such as glass bottles. Another case concerns the 44% of IESP taxes (*Impuesto Especial Sobre la Producción*) which consumers have to pay for hard liquor, cigarettes, and gasoline and which makes potential customers take a beer before they consider buying a bottle of mezcal<sup>18</sup>. Likewise, banks have officially not been eager to support this activity<sup>19</sup>, and specific Chambers such as that of tequila producers have closed the door on them (the local CANACO -membership whereof is compulsory- has accepted them but does little for its affiliates). Neither is there a for-

mal association to deal with local, regional or national governmental institutions.

This is, however, the formal side of the story. Once one "deconstructs" institutional agencies and sees them for what they are -organizations of individuals having their own projects and practices, and operating within broad and flexible policy guidelines- the picture that emerges is somewhat different. So, despite a discriminatory formal environment, producers have been able to find credit for their activities, have found a way to defend their interests by mobilizing local and regional governments, and have succeeded in stemming the Chamber of Tequila Producers in their favour. For example, some producers have succeeded in 'manipulating' the system by obtaining soft BANRURAL credits originally intended for agricultural or animal husbandry purposes. By the same token, they have easy access to municipal operating licenses, and may even count on a 'helping hand' when it comes to sanitary, labour or tax inspections. Likewise some of them have managed to procure alcohol at all times -in Jalisco virtually an impossibility for firms not registered at the Chambers of Tequila Producers or Alcohol Producers<sup>20</sup>. The success of producers can only

be understood by the relations they engage in with willing actors of formally unwilling institutions. These transactions are often based on kinship and compadrazgo relations, but also reciprocity is involved, as for example when a producer provides (for free) all the spirits necessary for parties or political manifestations of important CNC leaders, regional delegates or higher officials.

## 5 Conclusion

In this paper I have utilized the notion of clustering and collective efficiency to capture a form of productive organization definitely in existence. In the example of mezcal, a historical and gradually increasing division of labour has set in motion a flexible type of manufacture. This flexible and viable form is characterized by externalization or the fragmentation of the production process into a multiplicity of individual producers, suppliers etc., thus enabling rapid changes along the network of vertical and horizontal relations and in turn facilitating quick shifts in output level. The emergence of such a form of produc-

tion is obviously relevant for a number of reasons. For one thing, in this paper the appearance of incipient industrialization through collective efficiency is not dependent upon technologically sophisticated machinery or inputs. This is important because craft production (as opposed to Fordist mass production) is widespread in Third World countries, and especially in rural areas. Second, the progressive productive externalization of small-scale, flexible production forms create important backward and forward linkages (Hirschman 1981) that may bolster economic recovery and income generation. Finally, small, flexible networks of firms can act and react more swiftly to the disruptive circumstances characteristic of LDC's than rigid, large-scale industry -especially in the context of the globalization of the world economy. A word of caution, however, is on its place here. Small does not necessarily mean beautiful. The fact that clustering, as in the case of the mezcal producers of Jalisco, has brought about collective efficiency in the form of a flexible form of production must not blind us for similar or dissimilar historical situations that point in another direction<sup>21</sup>. Likewise, flexible organization of production in the form a progres-

sive externalization of tasks locates crucial areas of decision-making outside the firm, thus raising questions about power differentials and asymmetrical inter-firm relations. Clearly the debate on flexible specialization and its applicability in under-developed contexts is new and in need of much analytical refining. I hope that the empirical evidence shown in this paper contributes in some way.

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## Notes

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1. This is evident if one considers the recent change of focus of the official *Banca de Desarrollo* (Development Bank). Up to 1993, this Bank channelled resources to the agricultural sector through BANRURAL and FIRA; from 1993 onwards, the Development Bank directs most of its capital through *Nacional Financiera* (NAFIN) and the *Banco de Comercio Exterior* (BANCOMEXT) in an all-out attempt to make competitive micro-, small-, and medium-sized enterprises. To give an idea of the dimension of this endeavour: until 1993 all credit for the more than 2,000 *paraestatales* (government-owned enterprises) was disbursed through NAFIN. The amount credited to the former *paraestatales* is now being channelled to micro-, small-, and medium-sized firms, and is being financed by the surplus on the national balance of payments obtained through the sell-out of nearly 1,000 state-run enterprises during the Salinas Administration (including the largest company in Latin America, TELMEX, as well as 18 commercial banks).

2. Flexible specialization embraces both large and small-scale versions. The large variant entails decentralization and new organizational techniques, while the small-scale version results from the network or cluster of vertically or horizontally linked small firms (Morris and Lowder 1992; Schmitz 1990; Rasmussen *et al.* 1992).

3. This part draws extensively on Muriá (1990).

4. A fermented beverage obtained from the heart of another type of agave.

5. Outlet store under government supervision.

6. This collection of taxes through the sale of (above all) *vino mezcal* was no triviality. For example, by 1672 the Governor used the tax money obtained from *vino mezcal* to alleviate the water shortage by paying for its transport from Chapala. Another example is the magnificent Palacio de Gobierno (one of Guadalajara's most impressive colonial monuments) the first half of which was built with mezcal money coming from the *estanco*. The second half was constructed with other resources. In 1785, in order to support the export of peninsular spirits, King Carlos III prohibited the production of local liquor. This prohibition was partially lifted in 1795, five years after the completion of the building.

7. It took some time though before these differences in name became officially acknowledged. By the beginning of the 20th century, nearly one hundred years after *tequila* was a burgeoning term, official statistics still referred to both *tequila* and *mezcal* as *vino mezcal*. Today, *tequila* is widely understood to be a different product than *mezcal*. This difference is mainly based on the deodorization process of *tequila* by which it loses the somewhat harsher flavour characteristic of *mezcal*. In their respective production areas, however, confusion still exists as both *tequila* and *mezcal* are simply referred to as *vino*.

8. Some of the producers also opposed the road as they feared that with it, the State (taxes, quality control) would arrive.

9. In Mexico mezcal from El Llano is distributed in the states of Jalisco, Colima, Aguascalientes, Guanajuato, Zacatecas, Michoacán and Nayarit. In the U.S. it is sold in Washington, Oregon and California.

10. Right texture, right slope, not too much shade, etc. In short, the right micro-climate. This however is in itself a complex matter because there exist some 15 different varieties of agave that can be utilized

in the production of mezcal -each adding a peculiar taste to the liquor and each demanding different soil conditions.

11. The agaves from these regions have a higher sugar content than the varieties found in El Llano (this is traduced in more mezcal per kilogram of agave). However, the milder taste of the former is not found strong enough by mezcal producers, and agaves from Tequila and Los Altos need to be blended with local varieties. Curiously, producers of tequila add a certain amount of varieties from El Llano to their blends too in order to give more body to their product.

12. Adding sugar, increasing the temperature and the use of chemicals can increase alcohol content, fermentation speed, or both.

13. Negotiations are currently at hand with distributors in Chile (with which Mexico has a Free Trade Agreement), Venezuela, Colombia, and Costa Rica (soon to sign a sortlike agreement with Mexico).

14. The two largest producers, however, pursue a different strategy and are reconverting their properties into *mezcaleras*. The reason for this is a better control over supply and demand of this prime resource, as well as the economic potential of the crop: agave is a very profitable crop provided one has enough capital to wait 6 to 10 years for the plant to mature. With profits in the range of \$3,500-4,000 USD per hectare/year, unirrigated agave is second only to sugar cane production (which requires irrigation) and the extremely risky horticultural crops such as tomatoes, melons or watermelon.

15. *Seguro de Ahorro para el Retiro* is a retirement pension. Employers' participation amounts to 2% of the monthly gross salary of the worker.

16. *Instituto para el Fomento Nacional de Vivienda para los Trabajadores*. The employers' share in this housing fund amounts to 5% of the workers' gross

monthly income.

17. Though not all innovations, of course. The sheer volume of capital investments made by tequila producers makes it impossible for mezcal firms to adopt certain techniques. Another inhibiting factor is that *tequila* is a protected product name with very strict production norms. Whenever a mezcal too closely resembles the taste of *tequila*, the Chamber of Producers of Tequila, fearing potential competition (any product made from agave in the State of Jalisco may officially adopt the name of *tequila*) immediately sends an inspector who may actually close down the firm (though generally bribes in the range of US \$2,000-7,000 are paid).

18. In addition, 10% of IVA (value added tax) is added on top of the IESP. According to liquor producers, this is not constitutional because the IESP does not add to the value of the product. A long lasting legal battle is presently being fought out with Hacienda on the matter.

19. NAFIN does through its program of *Empresas Integradoras*. However, it demands from *mezcal* producers that they be formally associated, which is not the case.

20. Alcohol production is a state-run monopoly. Sold only to members of the *Cámaras*, it is sometimes hard to get as major companies such as Bacardi buy all production in advance. Periodical alcohol shortages have multiplied after the closure (in 1991/92) of one third of Mexican sugar refineries.

21. See Wilson (1992) for an example of small garment producers in Michoacán where decline in collective efficiency resulted from increased enterprise differentiation.