ALCOHOL CONSUMPTION AND ITS IMPACT IN MEXICO, 1970-1984: SOCIO-ECONOMICAL VARIABLES

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SUMMARY

In a time trend ecological study, an analysis was made of the evolution of the total consumption per capita of alcoholic beverages and of consumption by type of beverage, in Mexico between 1970 and 1984.

By correlating the evolution of the total consumption per capita with the Gross Domestic Product (GDP), the index of consumer prices (CONPRI), the minimum wage (MINWAG), and the outlets rates (TRE), an equation was found that explains 95% of the variance of per capita consumption in this period. It is formed by the GDP (85% of the explained variance), the MINWAG (6%) and the TRE (4%).. Finally, the consumption of alcoholic beverages was found to be independent of the prices.

INTRODUCTION

Lederman's model postulate that there is a direct and positive association between the level of overall alcohol consumption of a population, the prevalence of heavy drinkers and the rates of related problems (Brunn et al , 1975).

Some authors (Terris,1976) reported a strong relationship between, i.e, per capita consumption and liver cirrhosis

mortality; other research analyzes variations in alcohol availability within populations, its relationship with changes in per capita consumption and with alcohol related problems, which apparently undergo concomitant modification (Rabow and Watts,1982)(Rush et al,1986)(Parker and Harman,1987).

From that model of the distribution of consumption, it can be assumed that reduction or control of per capita consumption in a population may reduce the excessive prevalence of drinkers and related problems.

However,empirical evidence does not always support this theoretical assumption: various studies have demonstrated that the relationship is not direct and that not all the measures aimed at controlling alcohol availability have the same impact on the level of per capita consumption, nor is this level reflected in the same way in the different types of problems related to consumption in different populations (Smart,1987; Smart and Mann,1987).

Alcohol availability is integrated by many factors: production, imports and distribution of alcohol, prices, rates and distribution of outlets, hours of sale and limits of age, among others. It has been suggested that other sociodemographic indicators may also explain alcohol consumption and related problems, such as unemployment rates, income and the degree of urbanism (Gliksman and Rush,1986). It has been stated, that when prices and incomes keep an adequate distance, alcohol become less accessible and therefore consumption is less likely to increase. The same assumption is applied to the rates of alcohol outlet (Parker and Harman,1987)(Schmidt and Pophan,1978).

As the literature on the subject points out, it is difficult to determine which factors, among those mentioned explain changes in per capita consumption; different factors interact in a particular way in each population. As stated by Skog in his theory of social interaction (Skog,1986), the level of consumption within a population and the prevalence of heavy drinkers are a result of biological, psychological and social variables which interact and produce multiple effects. The culture of alcohol and drinking within a population is an important determining factor on alcohol related problems, and therefore, the mechanisms which regulated the drinking habits of an individual are strongly influenced by the drinking habits of the social group that surrounds him; this is related to what Lederman calls the "snow ball" effect (Skog,1980),

México; an overview of alcohol consumption: Alcoholic beverages have been produced and consumed in México since ancient times but, the type of beverages, the context of consumption and the means for control have changed significantly (Rosovsky,1985).

These changes are related to those experienced by the country as a whole with a rapid process of urbanization and the adoption, during recent decades, of new life styles and drinking habits clearly influenced by other cultures. Thus, both regarding alcohol consumption and other behaviors, México keeps traditions from its Indian past and from the Spaniard Conquest. Both cultures were mixed and new ethnicities and social organization were born; there is also a "modern" México that is undergoing a process of industrialization and development. Old and new customs are intermingled, and new social subgroups are emerging. Thus, the panorama is heterogeneous and it is almost impossible to make a generalization as to the behavior of any phenomenon, for all regions of the country. México has now more than 85 millions of inhabitants, half of them younger than 15 years old. Iliteracy level is around 4% and people are increasingly emigratting from rural to urban centers many living in margination. Average level of schoolings four years.

International types of industrial alcoholic beverages are consumed by most of drinkers, particularly in urban areas and the number and variety of these beverages reflects the development of this industry in México since the Second World War (Quintar,1983). On the other hand, many traditional beverages are still being produced and consumed mainly in rural areas, combined with the consumption of the industrial beverages.

Although measures of control were developed, alcohol is still very accessible to everyone. Though, alcohol consumption and related problems are not equally prevalent: a large proportion of the population is abstemious, particularly women, and among the drinkers a high proportion consumes alcohol infrequently, but in high quantities with episodes of drunkenness, as shown in a number of studies (Medina-Mora,1987). Alcohol related problems are manifested also in different ways: while the rates of deaths by liver cirrhosis are high though stable over the years, crimes and accidents occurring under the influence of alcohol, present considerable variation. There are also significant regional differences regarding consumption and the problems just mentioned.

In this article, we intend in first place, to analyze some indicators of Mexico's alcohol availability and of socioeconomic aspects, and their association with per capita consumption during the period 1970 to 1984. In a further paper we will analyze consumption with regard to some chronic and acute problems which traditionally have been considered as associated with excessive alcohol consumption.

We will analyze whether the sales of alcoholic beverages, prices, number of outlets and wage levels, are associated with per capita consumption in México. This type of analysis, witch tries to test the theoretical model mentioned initially, may have some important implications for the creation and evaluation of preventive policies in México.

METHODS

Sources and characteristics of available data are described as follows:

Per Capita Consumption. (Table I)

Sale volumes of alcoholic beverages, excluding exports and including imports, were used to calculated per capita consumption in liters of ethanol.

Table I present data showing the evolution of apparent per capita consumption of alcoholic beverages for the Mexican population. The data are divided into total per capita consumption, per capita consumption of tables wines, beer, spirits, pulque (a traditional fermented beverage) and other alcoholic beverages . As is shown, alcohol consumption grew considerably from 1.8 liters in 1970 to 3.3 in 1980, an increase of 84%. Total consumption remained at this level for the following 4 years, and then decreased to 2.9 liters in 1984.

Beer and spirits, such as brandy, rum and tequila are among the main beverages consumed in México. Although sales of table wines have increased considerably, its consumption is still low and fouded mainly by some urban sub-groups. The beer industry in México ranks 6th in the world and first in Latin America. In many sub-groups, beer is consumed as a substitute for soft drinks, especially in the hotter regions of the country. Among the spirits, brandy and rum have shown a growing trend and are continuously competing by means of major advertising campaigns in order to attract a larger part of the consumer market.

Pulque, an ancient fermented beverage, has been displaced and its consumption decreased in urban areas. It must be pointed out that, particularly in rural areas, there is clandestine or home production of pulque and distilled beverages. Further production is carried out by many plants which operate legally but outside government tax control due to the small volumes of alcohol produced. There are also large quantities of pure sugar cane alcohol that industry utilized, and some considerable amounts are sold to the public and consumed by low income groups for reasons of price. The latter cases are not included in the data utilized here.

Outlets (Table II)

The operation of outlets is governed by sanitary and commercial regulations. There are limitations in opening hours according to regional norms, but the restriction of sales and

consumption to youngsters of less than 18 years old apply in the country as a whole, though the enforcement of these control meassures is dubious. There are an unknown number of clandestine outlets functioning mainy in poor urban and rural areas.

Table I
MEXICO: EVOLUTION OF PER CAPITA CONSUMPTION
ACCORDING TO TYPE OF BEVERAGE IN LITRES OF ALCOHOL
/ TOTAL POPULATION.
1970 - 1984

DATE	TOTAL	WINE	BEER	SPIRIT	PULQUE	OTHERS
1970	1.8	0.011	1.400	0.158	0.241	0.000
1971	1.6	0.013	1.200	0.144	0.277	0.000
1972	2.3	0.012	1.400	0.517	0.285	0.097
1973	2.4	0.013	1.500	0.570	0.245	0.099
1974	2.5	0.014	1.700	0.486	0.220	0.108
1975	2.5	0.016	1.600	0.565	0.200	0.110
1976	2.6	0.018	1.600	0.657	0.200	0.098
1977	2.9	0.020	1.700	0.821	0.205	0.152
1978	2.8	0.021	1.700	0.746	0.188	0.158
1979	3.2	0.037	1.900	0.923	0.180	0.167
1980	3.3	0.036	1.900	1.063	0.175	0.184
1981	3.3	0.036	2.000	0.924	0.165	0.192
1982	3.3	0.033	1.950	0.981	0.160	0.184
1983	3.3	0.030	1.700	0.986	0.156	0.150
1984	2.9	0.044	1.700	0.909	0.156	0.060

Source: Different Industrial Associations: (Asociacion Nacional de Vitivinicultores, Asoc. Nac. de la Ind. Cervecera, etc.)

Prices

There is no price control for alcoholic beverages in our
country. Although the overall price index and the prices of each
type of beverage have undergone a considerable increase, the
former has increased more than the price of many alcoholic
beverages. This means that basic goods such as food, and clothing
underwent higher increases than alcohol. Recent economic policies
propitiating free trade with other countries have led to the
importation of large quantities of alcoholic beverages as well as
to price competition between national and foreign products. As a
result prices are comparatively low.

Table II
MEXICO: EVOLUTION OF THE RATE OF ESTABLISHMENTS AND
SOCIOECONOMICAL VARIABLES
1970 - 1984
(RATES PER 100.000 INHABITANTS)

DATE	TOTAL RATE OF ESTABLISH-MENTS a	CONSUMER PRICES b	REAL MINIMUN WAGE c	GROSS DOMESTIC PRODUCT d
1970	306.00	32.30	96.97	444,271.40
1971	312.00	34.00	91.69	462,803.80
1972	335.00	35.70	103.82	502,085.90
1973	335.00	40.00	95.48	544,306.70
1974	328.00	49.50	107.00	577,568.00
1975	303.00	57.00	108.75	609,975.80
1976	281.00	66.00	120.00	635,831.30
1977	280.00	85.10	124.44	657,721.50
1978	284.00	100.00	120.00	711,982.30
1979	294.00	118.20	117.15	777,172.60
1980	307.00	149.30	109.40	841,854.50
1981	311.50	191.10	109.43	908,764.80
1982	317.00	303.60	98.84	903,838.60
1983	358.39	612.90	86.58	856,173.60
1984	370.04	1014.10	78.90	887,647.40

SOURCE

a) Statistical Year-Book of the United States of Mexico
(INEGI -SPP-).
b) Banco de México: Indicators from Banco de Mexico - March
1988 (Base 1978 = 100).
c) Real Minimum Wage in Mexico City (1978 Prices), Nacional
Financiera.
d) Statistical Year-Book of the United States of Mexico (in
Millons of Pesos, 1970 Prices).

Minimum wage

Real minimum wage indices indicates the evolution of the purchasing capacity of wage earners in Mexico City and show a decline from 1978, when the country's economic crisis started to be more evident, and continued that in the rest of the series.

Gross domestic product

The gross domestic product can be seen as an indicator of a country's development. Mexico underwent a boom period that culminated in 1980-1981, which coincided with oil exportations. With the fall of crude oil prices in the international market, the increase in the external and internal debt and the subsequent inflationary process, the gross domestic product began to decrease after 1981, and did not begin to recover until 1984 .

RESULTS

We have considered this paper to be an ecological study of a tendency across time (Morgenstern,1982) where the dependent variables are the total per capita consumption (TPCC) and by type of beverage, and the independent variables the Gross Domestic Product (GDP), the retail price (CONPRI), the total rate of alcohol outlets (TRE) and the minimum wage (MINWAG). A multiple regression procedure has been applied to these variables, using the statistics package SPSS/PC (Norusis,1984).

An equation was obtained formed by variables GDP, MINWAG and TRE that explains a total of 95% of the variance observed in the TPCC for the period studied. The only variable not included in the model was CONPRI.

Table III

CORRELATION OF TOTAL CONSUMATION PER CAPITA OF ALCOHOLIC BEBERAGES WITH CONSUMPTION PREDICTORS. 1970 - 1984.

Multiple Correlation (Stepwise Method)

Variable	Total Variance Explained when entering into the Ecuation (R^2)	Sig.
GDP	.854	.000
MINWAG	.918	.001
TRE	.954	.014

$$TPCC = -4.67 + 2.88 \times 10^{-6}\ GDP + .03\ MINWAG + 8.62 \times 10^{-3}\ TRE$$

Since price variables had little explanatory power, simple correlations were done for the wholesale prices of bottled beer, red wine brandy and vermouth with the per capita consumption of beer, wine, spirits and others. Low correlations are observed that do not have statistical significance, except for wine. Nevertheless in this last case, the opposite relationship is observed, since as the price of wine increases, so does its consumption.

DISCUSSION

The presented data on per capita consumption of alcohol in Mexico may be considered lower than real, because as it was stated, the data refers only to industrialized beverages as these are the ones where registration is carried out, mainly for taxative purposes. Since variations in sales of other beverages are unknown, the increase observed in the series included could also be explained by changes in some consumers's habits replacing non-industrialized or regional beverages for industrial ones. This trend has been observed by studies conducted in semi-urban areas (Natera and Orozco,1981) where, for instance, pulque consumption among youngsters has been replaced by beer, rum and brandy. Another factor that may explain the increase in per capita consumption is that new subgroups consume alcohol, like women in urban areas and youngsters.

These hypotheses may be related with the correlation found between GDP and per capita consumption. In Mexico emigration from rural areas to large urban centers implicates strong changes in their ways of living, including drinking habits.

Mass media and increase on communications means also may play an important role in these trends; alcohol beverages are promoted and distributed in a more efficient fashion all over the country.

In opposition with alcohol literature (Cook,1981), per capita consumption seems to be independent of alcohol prices, since increases in alcohol price are not reflected in a decrease of consumption. Many Mexicans probably prefer to reduce their consumption of other goods rather than of alcohol since in our culture alcohol is so important for every social activity. Poorest people seem to consume more low price beverages such as non-industrialized or raw sugar cane alcohol(Skog,1986).

Rates of outlets by itself, does not explain per capita consumption according to our data. This indicator is limited, doesn't include illegal outlets and it's modified by market strategies; small establishments are disappearing while sales tend to concentrate in larger stores such as supermarkets. Purchasing habits are modified by urban life styles and the proliferation of the latter type of stores place alcohol within easy reach of shoppers as another good item among the basic ones.

The equation that was elaborated explains 95% of the per

capita consumption, by the combination of gross domestic product, minimum wages and rates of alcohol outlets.

Scope of the data, size of the series and the type of statistical analysis have limitations. If the founded association is real and explained consumption partially, other factors pertaining to the drinking culture at a microsocial level (22) should be sought for a better understanding. It is necessary to formulate other hypotheses regarding drinking behavior, the ways in which it develops or is shaped in different population subgroups, and the specific impact of socioeconomic development and availability in those groups.

On the other hand, it is necessary to continue to seek more and better information on the availability of ·alcoholic beverages, trying to obtain estimations of the volume of alcohol not included in our data here, and of the consumption at regional levels. The results of the recent national survey of alcohol and drugs' consumption in the general population (Instituto Mexicano de Psiquiatria-Direccion General de Epidemiologia,1988) could be used to calcule per· capita consumption, eliminating the proportion of abstemious males and females, in order to obtain better estimations.

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