

Potential consequences of replacing a retail alcohol monopoly with a private licence system: results from Sweden

Thor Norström¹, Ted Miller², Harold Holder³, Esa Österberg⁴, Mats Ramstedt⁵, Ingeborg Rossow⁶ & Tim Stockwell⁷

Swedish Institute for Social Research, Stockholm University, Stockholm, Sweden,¹ Public Services Research Institute, Pacific Institute for Research and Evaluation, Calverton, MD, USA,² Prevention Research Center; Pacific Institute for Research and Evaluation, Berkeley, CA, USA,³ Alcohol and Drug Research, National Institute for Health and Welfare, Helsinki, Finland,⁴ Center for Social Research on Alcohol and Drugs, Stockholm University, Stockholm, Sweden,⁵ Norwegian Institute for Alcohol and Drug Research, Oslo, Norway⁶ and Centre for Addictions Research of BC, Department of Psychology, University of Victoria, Victoria, BC, Canada⁷

ABSTRACT

Aim To examine the potential effects of replacing the Swedish alcohol retail system with a private licensing system on alcohol consumption and alcohol-related harm. **Design** Two possible scenarios were analysed: (1) replacing the current alcohol retail monopoly with private licensed stores that specialize in alcohol sales or (2) making all alcohol available in grocery stores. We utilized a multiplicative model that projected effects of changes in a set of key factors including hours of sale, retail prices, promotion and advertising and outlet density. Next, we estimated the effect of the projected consumption increase on a set of harm indicators. Values for the model parameters were obtained from the research literature. **Measurements** Measures of alcohol-related harm included explicitly alcohol-related mortality, accident mortality, suicide, homicide, assaults, drinking driving and sickness absence. **Findings** According to the projections, scenario 1 yields a consumption increase of 17% (1.4 litres/capita), which in turn would cause an additional 770 deaths, 8500 assaults, 2700 drinking driving offences and 4.5 million sick days per year. The corresponding figures for scenario 2 are a consumption increase of 37.4% (3.1 litres/capita) leading to an additional annual toll of 2000 deaths, 20 000 assaults, 6600 drinking driving offences and 11.1 million days of sick leave. **Conclusions** Projections based on the research literature suggest that privatization of the Swedish alcohol retail market would significantly increase alcohol consumption and alcohol-related harm.

Keywords Alcohol sales, alcohol-related mortality, demonopolization, projections, Sweden.

Correspondence to: Thor Norström, Swedish Institute for Social Research, Stockholm University, S-106 91 Stockholm Sweden.

E-mail: thor.norstrom@sofi.su.se

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INTRODUCTION

Various countries, as well as states or provinces within countries, have used government alcohol retail monopolies to limit the availability of alcohol and associated drinking and alcohol-related harm. In an extensive review of the literature, Her *et al.* [1] conclude that privatization of retail monopolies tends to stimulate consumption by increasing outlets, extending opening hours and lowering prices as a result of competition. Wagenaar & Holder [2] reviewed studies on the termination of retail wine monopolies and reported that of the 13 studies examined, 10 found significant increases in wine

consumption after the monopoly ended and that total alcohol consumption often also increased after allowing for substitution with other beverage types. Trollidal [3] found that wine sales increased by 10% after a similar change in Quebec. Holder & Wagenaar [4] found that elimination of a spirits retail monopoly in Iowa resulted in a statistically significant 9.5% increase in spirits sales, a decrease in wine sales and a net increase in total alcohol consumption. Trollidal [5] found that privatization of the retail sale of all alcohol in Alberta, Canada, had a significant lasting effect on spirits sales (but not total sales).

Hence, privatization of retail alcohol sales tends to increase population drinking [6], which in turn tends to

increase a wide range of alcohol-related harm rates [7]. For decision-makers dealing with alcohol policy, this *post-facto* evidence may be of limited value when considering a proposed alcohol policy measure. What is needed are projections of potential consequences, i.e. first, what is the likely effect of this measure in terms of change in total alcohol consumption; and next, how is this consumption change expected to affect population health? The present work is the third study that brings together these two types of evidence to project the effects of altering a specific alcohol policy measure on consumption, health and social harms in the Nordic countries, particularly Sweden. Holder *et al.* [8] projected potential changes in alcohol consumption and mortality rates in three Nordic countries that would result from alternative changes in alcohol prices and in retail sales of alcohol caused by joining the European Union (EU). Andréasson *et al.* [9] projected potential changes in consumption and alcohol-related harms under various possible scenarios of reduction in alcohol taxes in Sweden. Her *et al.* [10] applied basically the same approach to project the potential impact on consumption of privatizing/deregulating alcohol retail sales in Ontario, Canada.

The present study follows in this tradition by estimating the effects of replacing the Swedish retail alcohol monopoly with a private licence system on alcohol consumption and alcohol-related harm. This application is important for several reasons. First, in both Scandinavia and North America, this issue of weakening or totally eliminating government alcohol monopolies is debated regularly. Since Sweden's entry into the European Union (EU), the country has been questioned about its alcohol retail monopoly. The EU exerts constant pressures to eliminate key aspects of national alcohol policy that have historically been established for Sweden in the interests of protecting public health and safety. While the EU Court has upheld the legality of a monopoly alcohol retail system in Sweden, the provisions of the monopoly continue to be questioned. Secondly, the Swedish retail alcohol monopoly system comprises several types of restrictions on alcohol availability, and it is therefore feasible to illustrate the potential of complex or integrated policy measures. Thirdly, Swedish research has probed the impact of rising alcohol consumption on a broad range of health and social harms, and there is now more knowledge on elasticities and alcohol effects on harms than existed when the first projections [8] of monopoly privatization were carried out.

CURRENT SWEDISH RETAIL MONOPOLY AND ALTERNATIVE FUTURE SCENARIOS

Currently, Systembolaget is a government monopoly for off-premise retail sale of all alcoholic beverages

containing more than 2.25% alcohol by volume. The only exception is beer, with an alcohol content up to 3.5% by volume, which is sold in about 8000 grocery stores. There are approximately 400 Systembolaget stores and the most common opening hours are 10:00–18:00 h on Monday to Wednesday and on Friday, 10:00–19:00 h on Thursday and 10:00–15:00 h on Saturday. On Sundays, Systembolaget stores are closed. The legal age limit for buying alcoholic beverages is 20 years, but 18 years at on-premise outlets and for buying low alcohol content beer in grocery stores. In 2007, Systembolaget's sales were 5.3 litres of 100% alcohol per inhabitant 15 years and older and accounted for 54% of the estimated total consumption of 9.8 litres. Remaining parts of total consumption were unrecorded consumption consisting mainly of travellers' imports and smuggling (30%), on-premises consumption (10%) and low alcohol content beer (6%) [11]. If on-premises consumption and low alcohol content beer are excluded from the total, the market share of Systembolaget is 65%.

Both adult per capita consumption and Systembolaget sales were significantly higher in 2007 than only 10 years previously. Thus, per capita consumption rose from 8.2 litres per capita in 1997 to 9.8 litres in 2007, with corresponding increases for Systembolaget sales from 3.8 to 5.3 litres per capita. After 2004, however, per capita consumption declined somewhat, despite increasing sales at Systembolaget, due mainly to declining unrecorded consumption.

Systembolaget has been monitoring its public support through an external market research institute since 2001. Respondents are asked whether they want to keep Systembolaget or, rather, would prefer that other shops sell beer, wine and spirits. The support has increased from 49% in 2001 to 61% in 2007 [12].

We have considered two plausible alternative future scenarios in which the government retail monopoly is privatized.

Scenario 1: speciality alcohol shops

This scenario assumes that Systembolaget is dismantled and that the government issues a total of 800 licences to private shops that would sell alcohol under special restrictions as a speciality shop. This implies a doubling of the outlet density and corresponds approximately to the density of the licensed special alcohol retail stores in the Netherlands [13], which is the only EU country that has such a system. The total alcohol assortment in Sweden would be greater, and it would include some lower price beverages not currently sold. Average retail prices of alcoholic beverages would be unlikely to change dramatically if the current Swedish alcohol excise taxes were maintained. However, some alcoholic beverages

could be offered at discount prices and different stores could have quite different pricing systems. Speciality shops would probably have longer opening hours and increase advertising. Based upon studies from other countries, and specifically Nordic countries, monopoly retail outlets are more effective in enforcing the minimum legal purchase age than are private shops, and the elimination of Systembolaget would probably increase alcohol sales to underage individuals [14].

Scenario 2: all alcoholic beverages to grocery stores

In this scenario, grocery stores would be allowed to sell all alcoholic beverages, potentially up to 8000 stores if all food shops that currently sell beer of alcohol content less than 3.6% were to obtain alcohol licences. The product range in an average grocery store would be much smaller than that in an average Systembolaget store. Opening hours would mirror grocery store hours; that is, 84 hours weekly including Sunday. Grocery stores would stock cheap products that Systembolaget currently does not sell; for example, large food chains would probably offer cheaper and lower-quality drinks under their own brand. Enhanced point-of-sale promotions and less effective purchasing age controls compared with monopoly stores also seem likely.

DATA AND METHODS

Building the forecasting model

We modelled the effects on alcohol consumption and harm rates associated with the two scenarios through six steps:

- 1 Identification of the key variables that are likely to be affected by privatization;
- 2 Specification of likely changes in the key variables under the two scenarios;
- 3 Specification of the quantitative relationship (elasticities) between the key variables and per capita alcohol consumption;
- 4 Estimation of changes in per capita alcohol consumption under the two scenarios by integrating (2) and (3);
- 5 Specification of the quantitative relationship between per capita alcohol consumption and various alcohol-related harm rates;
- 6 Estimation of changes in harm rates under the two scenarios by integrating (4) and (5).

In step 1, we identified five key variables that are likely to be affected by privatization: (1) hours of sale, (2) retail prices, (3) promotion and advertising, (4) outlet density, i.e. number of retail outlets and (5) substitution, i.e. consumption would increase with privatized stores that reduce the consumption of alcohol purchased outside Sweden.

Table 1 Summary of variable values and elasticities by scenario.

Variable	Scenario 1		Scenario 2	
	Value	Elasticity	Value	Elasticity
Density	2	0.2	20	0.1
Hours of sale	1.2	0.2	1.8	0.1
Price	0.95	-0.6	0.90	-0.5
Promotion	1.05		1.08	
Substitution	RC ₁ /RC	-0.2	RC ₂ /RC	-0.2

RC₁: projected recorded consumption under scenario 1; RC₂: projected recorded consumption under scenario 2; RC: baseline recorded consumption.

Table 1 summarizes the elasticity values and expected changes in each variable under each of the two scenarios that were used in the forecasting. Below we explain the rationale underlying these value choices.

Hours of sale

In theory, current trading hours could persist under a private licensing system. In practice, experience in Canada and the United States suggests that liquor store associations might lobby persistently for the right to be open for longer hours. Our best estimate is that speciality stores under scenario 1 would stay open an additional 10 hours per week. Under scenario 2, we assume that current Swedish grocery store hours would apply, i.e. 12 hours a day throughout the week or 84 hours a week.

Our elasticity estimate was based on an evaluation of the Saturday opening of Systembolaget's shops, which was implemented in July 2001 after an experimental period of 17 months in part of the country. The evaluation suggested that adding Saturday trading hours, implying an increase from 42 to 47 hours a week, resulted in a 4% overall increase in sales [15]. This corresponds to an elasticity of 0.35. Further extensions of opening hours were assumed to be associated with lower elasticity values. For scenario 1 we chose an elasticity equal to 0.2, and for scenario 2, 0.1.

Prices

Two factors seem likely to lower alcohol prices. First, speciality alcohol shops, and to an even greater extent grocery shops under scenario 2, are (in contrast to Systembolaget) likely to use prices as a competitive instrument. One way of doing this is to stock a larger segment of low-priced products than does Systembolaget. Secondly, political and commercial actors are likely to exert consistent pressure to lower excise taxes that approach the EU standard, efforts that will be successful over time (an example of such activities is a review of Swedish alcohol

policy commissioned by The Brewers of Europe; the report [16] highlights the putative negative effects of the relatively high alcohol taxes in Sweden). However, as a counteracting factor, Systembolaget has a relatively low mark-up, presumably because it operates efficiently and with no profit interests. There would thus be an upward pressure on prices if private actors ran the business less efficiently. It is difficult to project the effects of these factors, but a general price decrease of 5% under scenario 1 and 10% under scenario 2 would seem to be conservative estimates.

The price elasticity used was based on the most recent estimates for Sweden [17]. We computed an average elasticity of -0.64 for beer, wine and spirits, weighted according to beverage-specific sales volumes. Assuming somewhat lower elasticities under a lower price regimen, we used an elasticity of -0.60 for scenario 1 and -0.50 for scenario 2.

Promotion and advertising

In 2003, the Swedish law prohibiting print advertising was changed to apply only to beverages above 15% alcohol by volume. Some wholesalers have already begun advertising alcoholic beverages. Currently, Systembolaget does not advertise, but private retailers would almost surely do so. Thus it seems likely that privatization would intensify advertising; however, we assume that the impact on consumption would be softened by required warning labels. A large number of well-designed studies suggest that alcohol advertising spurs consumption, not least young people's drinking (see [18,19] for reviews). Saffer & Dhaval [20] estimated that allowing advertising of beer and wine or of spirits in one of the media (radio, TV or print) raised consumption by 5%. Further, a large meta-analysis [21] concluded that the level of advertising is associated significantly with consumption at the population level; the outcome suggests that 5% is a conservative estimate. Thus, we used that figure (5%) as an estimate of how much increased advertising in a privatized speciality system (scenario 1) would raise consumption.

Selling alcohol in licensed speciality shops or grocery stores in Sweden would create an additional source of investment in alcohol promotion, which could affect consumption level. For instance, Bray *et al.* [22] concluded that promotions increase beer sales substantially, and that purchasing large package sizes may increase total consumption. Given the greater opportunity for product and price promotion, the widespread use of print advertising and the offer of large-volume containers in grocery stores elsewhere in the EU, we assume that expanding sales to grocery stores would increase promotion-related consumption by 3% more than in the speciality store scenario, or 8% in total.

Outlet density

Under scenario 1, we postulate that the government doubles the density by issuing 800 licences to privately owned stores that are to operate under certain restrictions as speciality shops. Under scenario 2, grocery stores are allowed to sell all alcoholic beverages. We assume that all 8000 food shops that currently sell beer with alcohol content less than 3.6% will obtain alcohol licences.

For scenario 1, we used the elasticity reported by Gruenewald *et al.* [23]; that is, 0.2. Because elasticity probably decreases with increasing density, we assumed an elasticity of 0.1 under scenario 2.

Substitution of recorded consumption for unrecorded purchases

If alcohol sales from Swedish stores increased significantly because privatization increased convenient local access, drinkers would be expected to spend less on alcohol from sources outside Sweden [24]. Essentially, increased physical availability of alcohol from a more expensive source might partially substitute for sales of less convenient although more affordable alcohol. This reflects the actual or perceived cost and difficulty of seeking lower-cost alcohol from a distant source. Norström & Ramstedt's [25] analyses of the relationship between Systembolaget's sales and estimated unrecorded alcohol consumption suggested an elasticity of -0.2 . Our model thus specifies that a 10% increase in Systembolaget's sales would reduce unrecorded alcohol consumption by 2%.

Specification of forecasting model

Because the effects of the various variables are likely to be interdependent [8], reinforcing each other, we apply a multiplicative model as follows:

$$C_i = RC * Dens_i^{e_{densi}} * Hours_i^{e_{hoursi}} * Price_i^{e_{pricei}} * Promo_i + Subst_i^{e_{substi}} * UC$$

where C_i is per capita consumption under scenario i , RC is baseline recorded consumption (i.e. Systembolaget's sales), $Dens$ is outlet density, $Hours$ is sales hours, $Price$ is alcohol prices, $Promo$ is promotion and advertising, $Subst$ is substitution (of recorded consumption for unrecorded purchases) and UC is unrecorded consumption. The following example shows how the model works: under scenario 1, density is assumed to double, i.e. $Dens_1 = 2$, while the elasticity for density under scenario 1 is estimated at 0.2. Recorded consumption is thus expected to increase by $2^{0.2} = 1.15$, or 15%.

Harm indicators

The indicators included in the projections were: explicitly alcohol-related mortality (e.g. alcoholic liver cirrhosis,

alcoholic psychoses, alcoholism, alcohol abuse and alcohol poisoning), accident mortality, suicide, homicide, assaults, drinking driving and sickness absence. These indicators reflect in part the harmful effects of chronic heavy consumption and in part the acute harmful effects of heavy drinking episodes. Predicting how much a given change in overall consumption will affect a harm indicator requires an estimated parameter that expresses the strength of the relationship between overall consumption and the indicator at issue. Except for the last three indicators, these estimates were obtained from the European Comparative Alcohol Study (ECAS) [26,27]. For each outcome a common methodological protocol was applied implying the use of the method for analysing time-series suggested by Box & Jenkins [28], often referred to as autoregressive integrated moving average (ARIMA) modelling. These analyses were carried out on country-specific data for the period 1950–95 and covered 14 European countries, including Norway, Finland and Sweden. The relationship between per capita consumption and harm indicators were estimated on the basis of differenced (detrended) time-series which greatly reduces the risk for obtaining biased estimates (see Norström & Skog [29] for a more detailed description of the methodological approach). Generally, semi-log models were used. The resulting parameter estimates express the relative change in the harm indicator, given a 1-litre increase in per capita consumption. Because estimates with small standard errors are preferable in the projections, we chose pooled estimates (for Finland, Norway and Sweden) whenever feasible. Because there was no estimate pertaining to the broader category of alcohol-related mortality, we took the estimate for cirrhosis mortality. It is recognized that the total effect on cirrhosis mortality of a change in per capita consumption is typically not realized instantaneously, but rather is distributed over a longer period of time. To take the lagged effects into account in the estimation of the alcohol effect on cirrhosis, a composite consumption measure was used that is a weighted sum of past and present observations, and where the lag weights are

fixed a priori (see Norström & Skog [29] for a more detailed description). We reduced the estimate by 2 standard errors in view of the weak response in alcohol-related mortality to changes in population drinking during the past decades [9]. For three indicators alcohol effect estimates were obtained from other sources than ECAS: assaults [30], drinking driving [31] and sickness absence [32]. These estimates were also based on ARIMA modelling (column 3 in Table 3 summarizes the effect parameters used).

The following formula was used to calculate the percentage change in a given harm indicator that is projected to be followed by a given increase in per capita consumption:

$$\text{Predicted Harm Increase (\%)} = 100 * (\exp(b \cdot \nabla C) - 1)$$

where ∇C is the change in per capita consumption (expressed in litres of 100% alcohol) and b is the alcohol effect parameter.

RESULTS

Table 2 shows the estimated effects of the various variables (adjusted for the effect of substitution) on consumption. The joint effect of all variables under scenario 1 implies a consumption increase from 8.2 to 9.6 litres; that is, 1.4 litres, or 17%. The corresponding figures for scenario 2 are 3.1 litres, or 37.4%.

Table 3 shows the projected changes in harm associated with the two scenarios. Replacing the current alcohol monopoly with private licensed speciality shops would increase the annual harm resulting from alcohol consumption in Sweden by 770 deaths, 8500 assaults, 2700 drinking driving offences and 4.5 million sick days. With grocery stores, the estimated annual increase would approach 2000 deaths, 20 000 assaults, 6600 drinking driving offences and 11.1 million days of sick leave.

DISCUSSION

The projections reported in the present study suggest that replacement of the current Swedish alcohol retail system

Table 2 Estimated cumulative effect on per capita alcohol consumption of various variables. All effect estimates are adjusted for the effect of substitution.

Scenario	1. Speciality shops		2. Grocery stores	
	Consumption (litres)	Increase from baseline (%)	Consumption (litres)	Increase from baseline (%)
Baseline	8.2		8.2	
Density	8.9	8.6	9.9	20.5
Density + hours of sale	9.1	11.2	10.3	25.4
Density + hours of sale + price	9.3	13.3	10.7	30.1
Density + hours of sale + price + promotion	9.6	17.0	11.3	37.4

Table 3 Estimated increases in harm rates under scenarios 1 and 2.

		Alcohol effect ^a	Baseline n	Increase under scenario 1		Increase under scenario 2	
				%	n	%	n
Alcohol-related mortality from diseases	Men	0.19	1 451	30.5	442	80.2	1 164
	Women	0.07	407	10.3	42	24.2	99
Accidents	Men	0.08	865	11.9	103	28.1	243
	Women	0.03	264	4.3	11	9.7	26
Suicide	Men	0.10	801	15.0	120	36.3	291
	Women	0.08	325	11.9	39	28.1	91
Homicide	Total	0.12	106	18.3	19	45.1	48
Total			4 219		776		1 962
Assaults ^b	Total	0.07	82 262	10.3	8 470	24.2	19 936
Drinking driving ^b	Total	0.10	18 122	15.0	2 718	36.3	6 578
Sickness absence ^c	Men	0.12	24 636 000	18.3	4 506 826	45.1	11 101 794

^aEffect parameter from semi-log model (see text). ^bNumber of police-reported offences. ^cDays/year.

with a private licensing system would cause a marked increase in population drinking and alcohol-related harm rates. However, even though our work was based on the best available evidence, there are considerable confidence intervals associated with the elasticities upon which our modelling is based. Hence, the projections are to be seen as what may plausibly happen, rather than as exact predictions. Sweden has two previous experiences of weakening the current alcohol retail monopoly, both by allowing grocery stores to sell beer and being abolished as a result of increasing alcohol-related problems. One was a local experiment starting in November 1967, in which two counties introduced sales of strong beer in grocery stores. The experiment was planned to continue until the end of 1968 but was interrupted in July due to reports of increasing alcohol-related problems, especially among youth [33]. The other initiative was the nation-wide introduction of medium-strength beer (<4.5% by volume) in grocery stores in 1965, which was repealed in July 1977. Again, a main reason behind the decision was reports of increasing alcohol-related problems among youth, an effect confirmed by subsequent systematic analyses [34].

Critics may contend that the focus upon total consumption is not relevant in studies of the present kind, and that it would be more feasible to focus upon problem drinkers. However, preventive measures based on population strategies tend to be more efficient and feasible than targeted interventions [6]. However, alcohol policy is not only concerned with the overall effects of drinking on population health; it is often also concerned with the consequences for particularly vulnerable groups. One limitation of our projections is, thus, that we have not addressed the potential consequences of privatization of the retail alcohol monopoly for such groups in the population. The reason for this is that the empirical basis for such projections is as yet insufficient. Several studies

suggest, however, that because a government monopoly system does not have a private profit motive, it may be more successful in curbing alcohol availability, consumption and harms among young people [14,35,36]. In this context, it is also worth mentioning that experience from the marked cut in alcohol prices in Finland in 2004 suggests that the adverse effects were observed in particular among the less privileged in society; that is, among the unemployed and those with a low education level [37].

In conclusion, given the projected changes in availability, low-price products, enforcement of minimum legal age, promotion and marketing and on the basis of the existing research literature on these topics, it seems very likely that privatization of the Swedish alcohol retail market would increase alcohol consumption, and thereby alcohol-related harm, significantly.

Declarations of interest

None.

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