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BY JEREMY CLARK[†][1]

April 19, 1999

Departures from self-interested behavior have been observed in a broad range of economics experiments, and suggested by case studies of ethical purchase behaviour. These are often attributed to people's ethical preferences or altruism. This paper looks for empirical evidence of ethical purchase behaviour in a decentralized, private good market. From the assumption that a good's marginal utility is conditional upon its perceived ethical status, it follows that demand for the good should shift with changes in its perceived ethical status relative to other goods. This assumption is tested with reference to Canadian demand for Chilean wine in the years 1962 to 1994. It is asked whether consumer demand shifted to the left during Chile's military dictatorship between 1973 and 1989. Despite suggestive changes in export trade patterns before and after the dictatorship, no significant evidence of ethical purchase behaviour is found after controlling for relative prices and expenditure.

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I. INTRODUCTION

Do consumers care about the conditions under which their goods are produced? Or about the external effects of their purchases? If they do, can these preferences play any observable role in decentralized markets? The answers are not obvious. On the one hand, competitive markets with full information and without externalities are thought to allocate resources efficiently. Under such markets, we would expect to see production tailored to meet the preferences of all stripes of consumers, including the socially conscious. On the other hand, a chief characteristic of markets is their ability to economize on the transmission of information through prices. As Milton and Rose Friedman (1980, p. 16) observed, when purchasing pencils, we need know only their price. We need not know the conditions under which the pencil-makers laboured. If they are foreign pencil-makers, we need not know the local environmental effects of their production. Thus, we might predict that private markets will generate goods that purposefully appeal to ethical purchase concerns. With imperfect information, however, we might also predict that goods made under ethical or unethical conditions may not be differentiable. As economies become increasingly open to trade, the information available on the conditions or external effects of production can become increasingly remote. For example, there are reports that hardware tools or toys made by prison labour in China are mixed with conventionally produced goods for export (Globe and Mail 1992; United States Congress 1994). Thus, if we fail to observe ethical purchase *behaviour* in decentralized markets, it could be due to a lack of external preferences, or to lack of information.

Limited evidence of external preferences comes from economics experiments. With often small financial stakes, a substantial minority of subjects in bargaining, public good and other experiments appear to care about the distribution of money between themselves and others. This

apparent preference for fairness or altruism has been observed to respond negatively to cost, market framing, and subject anonymity. This paper attempts to move the positive investigation of ethical preferences from experiments to observed markets. It adapts a standard model of consumer demand to ask whether ethical preferences can be seen to influence demand when information on production conditions or effects is available. The model is applied to the case of Canadian demand for wine from Chile in the years between 1962 and 1994. During this period, Chile suffered a well-publicized military coup and dictatorship, human rights abuses, and a subsequent return to democracy. Canada is assumed to be a price taker for Chilean wine, and so a simple log linear demand for Chilean wine is estimated. There appear to be dramatic reversals in the quantity of wine sold from Chile to Canada during the years of military rule. Surprisingly, however, no significant decrease in demand for Chilean wine in Canada is found once price and income effects are taken into account.

The paper begins with a review of the small literature concerning ethical purchase preferences in section 2. Section 3 presents a standard model of consumer demand incorporating a simple binary representation of ethical preferences. Section 4 tests the model in the case of Canadian demand for wine from Chile. This is followed in section 5 with a brief discussion and conclusion.

II. ETHICAL PURCHASE BEHAVIOUR IN DECENTRALIZED MARKETS

Economists from Adam Smith to John Harsanyi have recognized that people might possess sympathy, "fellow-feeling" or "external" preferences over the welfare of others (Cambell and Skinner 1982; Harsanyi 1986). Yet self-regarding preferences have been seen as sufficiently dominant that positive economists could safely ignore "fellow-feeling" in economic agents, especially in the impersonal realm of competitive markets. Indeed, economic agents who claim to "trade for the

publick good" have commonly been viewed with suspicion (e.g. Adam Smith 1976, p. 456). Yet there is some evidence that consumers have ethical or external preferences, and that these preferences could influence market outcomes.

In economics experiments conducted over the past thirty years, a consistent minority of anonymous subjects in a wide variety of decision-making, bargaining and public good environments have deliberately given money away to others (Hoffman and Spitzer 1982; Ledyard 1995; and Roth 1995). Relevant here, Kahneman et al. (1988a) found that subjects in bargaining experiments preferred at some personal cost to share surplus with others who themselves had been generous in allocating surplus. Hoffman, McCabe and Smith (1994) have increased the financial stakes in ultimatum bargaining experiments, and found scale independence in the distribution of offers. In the case of public good experiments, Andreoni (1996) has tested whether cooperative behaviour can be attributed to error or altruism, and has found evidence of both.

When we turn to non-experimental tests of external preferences, the evidence is mixed. Initial research into voluntary charitable giving has found evidence that individuals care not only for the total level of charitable provision, but also for the level of their own contributions (Andreoni 1990). More recently, researchers have attempted to show through donor identification and contribution patterns that charitable giving could be attributable in part to self-promotion or insurance, rather than concern for others (Harbaugh 1996). Much less attention has been paid, however, to external preferences in decentralized markets for private goods. A literature within business ethics has asked which factors influence consumers' ethical judgements (Kahneman et al., 1988b; Vitell and Muncy 1992). This literature has relied mainly on surveys where consumers are presented with vignettes about producer behaviour and asked for moral assessments. A rare survey of ethical purchase *behaviour* is presented

in N. Craig Smith's *Morality and the Market* (1990). Smith presents case studies of ethical purchase campaigns, often boycotts organized against companies or countries accused of unethical dealings. He also informally models the formation of highly motivated pressure groups who use the media to overcome information deficiencies about production conditions or externalities. Descriptive case studies include campaigns against firms banking in apartheid-era South Africa, producing cruise missiles, processing Angolan coffee, selling infant formula in developing countries, and growing grapes with non-unionized migrant workers. On the basis of these and other case studies, Smith identifies the characteristics of goods most susceptible to ethical purchase boycotts. They tend to be

1. consumer (final) goods
2. with low cost
3. frequently purchased
4. branded
5. perishable
6. distributed through retail outlets
7. publicly purchased
8. with substitutes readily available.

This list has striking parallels to the factors that have been found to influence ethical behaviour experimentally. Notably, experimental ethical behaviour has been shown to respond to price, information and the anonymity of decision-makers (Eckel and Grossman 1997; Hoffman et al., 1996).

As mentioned, Smith's case studies are descriptive rather than empirical. In addition, his criteria for success is measured in part by corporate response to threatened action, rather than by actual change in consumption patterns. This paper will attempt to test empirically for non-strategic ethical purchase behaviour, informed by Smith's findings.[1]

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[1] "Non-strategic" refers to the fact that individual consumers are price-takers in large markets and so presumably do not hope to unilaterally influence producer behaviour.

III. CONSUMER DEMAND AND ETHICAL PURCHASE BEHAVIOUR

A comprehensive model of ethical purchase behaviour would have to confront the role of information in markets. One could think, for example, of modeling the formation of pressure groups by individuals with the strongest ethical purchase concerns. These individuals might research and publicize information on production conditions or externalities on behalf of less motivated (free-riding) consumers. In addition, a comprehensive model would have to provide a criteria for defining "ethical" and "unethical" behaviour on the part of firms or countries. For example, one could construct ethical production indices for countries or firms based upon their use of involuntary (prison or child) labour, violation of environmental law, participation in human rights abuses, etc.

As a first step, however, I shall retain the standard model of consumer demand. Full information shall be assumed, and the criteria for ethical status shall be left unspecified. To begin, consider the standard preferences of consumer *i*:

$$U_i = U_i(x_1,\ldots x_j,\ldots,x_m)$$

$$\text{where } U_j' > 0,\ U_j'' \leq 0 \qquad \text{for j} = 1,\ldots,\text{m} \qquad (1)$$

Consumer *i* seeks to maximize his utility by purchasing physical goods, subject to each good's relative price, and his total income.

$$\text{Max } U_i(x_1,\ldots,x_m)$$

$$\text{s.t. } p_1x_1 + \ldots + p_mx_m \leq M_i \qquad (2)$$

$$\rightarrow \quad x_j^*(p_1,\ldots p_m, M_i) \qquad \text{for j} = 1,\ldots,\text{m}$$

Solving (2) results in (Marshallian) demands for each of j = 1,...,m goods. Ethical consumption preferences can be introduced mechanically in two steps. First, in the words of Smith (1987), assume that each good has a potential "negative product augmentation" for the consumer. In the simplest

possible case, assume he or she attributes to each good an ethical status of "o.k." or "not o.k." Second, assume that the marginal utility the consumer receives from a good is conditional upon that ethical status. Thus, for consumer *i*,

$$\frac{\delta U(x_1,\ldots x_j \ldots x_m / 1=\cdot, \ldots, j = o.k., \ldots m = \cdot)}{\delta x_j} \quad > \quad \frac{\delta U(x_1,\ldots x_j \ldots x_m / 1=\cdot, \ldots, j = not\ o.k., \ldots m = \cdot)}{\delta x_j} \qquad (3)$$

With these two assumptions in mind, consider the first order conditions from the consumer's problem for any two goods, say 1 and 2. Substituting their first order conditions together, we have

$$\mathrm{MRS}_{2,1} = \frac{U_1}{U_2} = \frac{p_1}{p_2} \qquad (4)$$

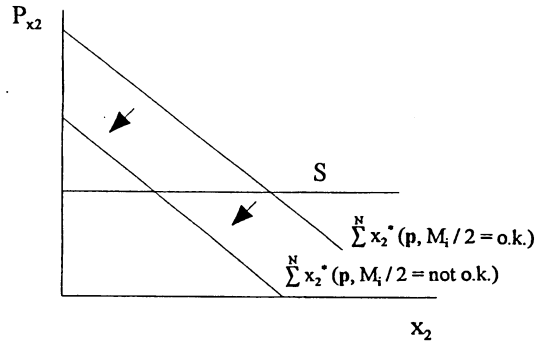
If consumer *i* judges the ethical status of good 2 to drop from "o.k." to "not o.k." while good 1's status remains unchanged, the ratio of marginal utilities would increase. That is, the marginal rate at which *i* would give up good 2 to get more of good 1 ($\mathrm{MRS}_{2,1}$) would increase. If the ratio of prices did not change, *i* would then want to purchase less of good 2 relative to good 1 to restore (4).

$$x_2^*(p, M_i / 2 = not\ o.k.) < x_2^*(p, M_i / 2 = o.k.) \qquad (5)$$

We may aggregate this result across a group of *N* like-minded consumers. Figure 1 illustrates the effect of good 2's fall from grace in consumers' eyes. Note that if the consumers are price takers and supply is perfectly elastic, price should remain constant, but the quantity of good 2 sold should fall. Similarly, if good 2 should regain ethical standing, all else equal, demand should shift back to the right. We shall turn next to test empirically for the existence of such an ethical demand shift.

FIGURE 1

SHIFTS IN DEMAND CAUSED BY A CHANGE IN ETHICAL STATUS



IV. ETHICAL PURCHASE BEHAVIOUR: THE CASE OF CHILEAN WINE

Background. A good such as bottled wine would seem well-suited as a test instrument for ethical purchase behaviour according to Smith's criteria. It is a consumer good with a small budget share, frequently and publicly purchased in Canada from liquor outlets, with many substitute varieties available. Of special relevance, bottled wine provides prominent information concerning its country of origin. Thus, purchasers of wine are more likely to be aware of its national origin than purchasers of other consumer goods.

Chile, situated along the south-west coast of South America, has long enjoyed a reputation for ideal wine-growing conditions, and as the premium wine-producing country of South America (Simon 1981, Robard 1984). Red wines, such as *Cabernet Sauvignon, Cabernet Franc, Cot Rouge* and *Merlot* have been exported to Britain, France and Spain since before the Second World War.

Canada began importing Chilean wines in the early 1960's, and by 1994 Chile supplied almost 10 percent of Canada's wine imports (U.N. annual). Chilean wines enjoy a reputation as being of "excellent quality and value for money" in comparison with European and American wines (Simon p. 557). Yet the country producing this wine has experienced great political upheaval.

Prior to 1970, Chile was governed under a constitutional and democratic political system. The country was characterized by a stability and tolerance of free discussion that was exceptional in South America (Alexander 1978). Though fairly industrialized by regional standards, Chile did not escape the problems of rural poverty and land distribution among native Americans and mixed-race *mestizos* (Edwards and Edwards 1994). Moderate social and land reforms in the 1960's under President Eduardo Frei were replaced by more aggressive reforms in 1970 under Salvador Allende. Allende led a coalition of socialists and communists who together proposed a program of nationalization, price controls, and land redistribution. High inflation, agrarian land expropriation, and black market expansion experienced under Allende led to increasing political confrontation. On September 11, 1973, an army coup replaced Allende's government with a military dictatorship, eventually concentrated under General Augusto Pinochet. In the four years following the coup, a newly-organized secret police force brutally murdered, tortured or exiled thousands of civilians (Oppenheim 1993). Yet concurrently, free market reforms were implemented, and private property rights were re-secured. After mounting international pressure, a revised military-backed constitution was implemented in 1980, but it promised a transition to constitutional government only by 1990. Following widespread political protests against the dictatorship in the early 1980's, a plebiscite was held on Pinochet's continuing rule in October 1988. Free elections were finally held in November of 1989, and newly elected President Patricio Aylwin took office in March, 1990.

Chile's 1973 coup, severe political repression, and subsequent struggle for democratic restoration received widespread attention in North America. *Time*, *Newsweek* and *Maclean's* between them featured 14 articles on the Chilean military's takeover or human rights abuses in 1973 alone, and 62 articles between 1973 and 1989 (Reader's Guide, Canadian Periodical Index). Thus, awareness of the political conditions in Chile among Canadian wine consumers should have been relatively high. In addition, the change in Chile's political status had a distinct beginning and end. Finally, in contrast to cases such as South Africa, the Canadian government took no action to discourage trade with Chile as a result of the coup or human rights abuses.[2] Thus any change in demand may be attributed to the decisions of individual consumers. For these reasons, Chilean wine seems a promising good to study for evidence of ethical purchase behaviour. We thus move from historical overview to empirical question: did Canadian consumers reduce demand for Chilean wine because of information about the political and human rights abuses in Chile?

Descriptive statistics of trade flows certainly suggest interesting shifts in trade patterns between Chile and Canada during this period. To set the stage, Figure 2 illustrates the total world exports of Chilean wine in the years before, during and after the military dictatorship. The data come from Chilean-reported data in the *United Nations Commodity Trade Statistics* (U.N. annual). Years under military rule are in pale grey, and no data is available for the year 1979. Wine exports rose gradually in the years before and after the coup in 1973, falling only in the early 1980's, before rising dramatically in the late 1980's when civilian rule was restored. Thus the supply of Chilean wine

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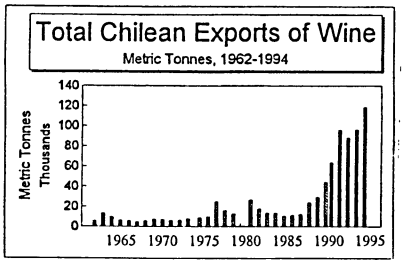
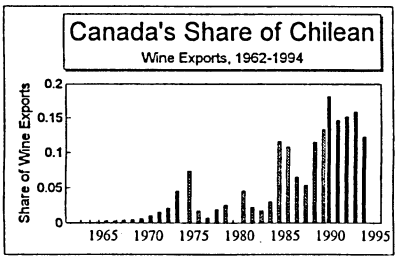
[2] Norman Frohlich has pointed out that the union handling liquor distribution in the province of Manitoba refused to handle Chilean wine following the coup. It is hoped that Manitoba's small share of Canada's wine imports (2.6% in fiscal 1974) will not seriously bias the results to be presented (Statistics Canada annual).

FIGURE 2
TOTAL EXPORTS OF CHILEAN WINE, 1962 - 1994

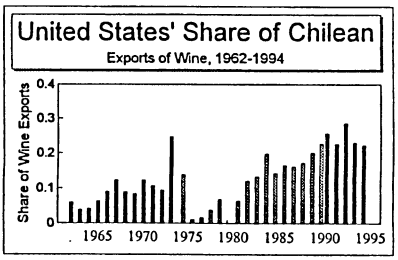


Source: United Nations *Commodity Trade Statistics*, 1962-1994

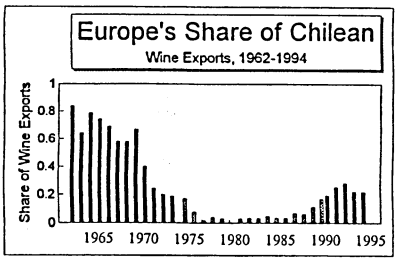
FIGURE 3
FOREIGN MARKET SHARES OF CHILEAN WINE EXPORTS



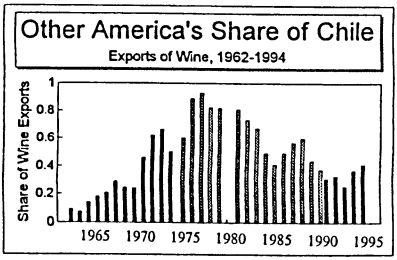
(a)



(b)



(c)



(d)

Source: United Nations *Commodity Trade Statistics*, 1962-1994

available for export did not appear to drop following the 1973 coup. Yet while total exports of wine remained healthy, Figures 3 a, b, c, and d reveal that the destination of exports tended to shift away from Canada, the United States and Western Europe in the 1970's, and towards other South American countries. Conversely, in the late 1980's, the share of exports to North America and Western Europe increased again, and the share to South America declined.

The quantity data might suggest that the demand for Chilean wine among wealthy Western consumers decreased following reports of the atrocities carried out in Chile, and recovered when civilian rule was restored. Yet the less we control for possible confounding influences, the less we can be sure this is so. Either price or income effects, for example, could have accounted for the shift in trade patterns. The relative price of substitute wines in Canada may have fallen in the 1970's and risen in the late 1980's from supply effects. Alternatively, expenditures on all wines in Canada may have dropped and then rebounded just as Chilean democracy was being restored. To control for these effects, we turn next to regression analysis.

Statistical Model Estimation. Suppose consumer i considers Chilean wine to be a distinct good j within the separable commodity group of m alcoholic beverages.[3] i's demand is

$$x_j (p, M_i ; \text{ethical status of goods } 1,...j...,m), \qquad (6)$$

where **p** is a vector of the m prices, and M_i is i's total expenditures on alcoholic beverages.

[3] The partition of commodities into separable groups for purposes of demand estimation requires one of several strong restrictions on a consumer's indirect utility or cost function (see Deaton and Muellbauer 1980, 130). Nevertheless, alcoholic beverages are commonly treated as separable from other goods in empirical work. Theil and Clements (1987, p. 215), for example, find in a systems-wide analysis using data from Australia, Britain and the United States that wine and beer/spirits form two block-independent groups in consumption.

Aggregate demand for wine across the Canadian population, N, would be:

$$X_j = \sum^{N} x_j (p, M_i;\ \text{ethical status of goods 1,...j...,m}) \qquad (7)$$

Strictly speaking, observed market demand can only be considered the exact linear aggregation of individual demands if consumers have linear Engel curves with identical slopes for good *j* (Deaton and Muellbauer 1980, p. 150). This seems a heroic assumption, but aggregate data is all that is available. To estimate market demand, I shall follow the original path of Stone (1954) as summarized by Deaton and Muellbauer (p. 61). We start with a simple logarithmic market demand function, but with the addition of ethical status demand shifters:

$$\log X_j = \beta_0 + \beta_1 \log \sum^{N} M + \beta_2 N + \sum^{m} \beta_{jk} \log p_k + \sum^{m} \gamma_{jk} Unethical_l + \epsilon \qquad (8)$$

β_1 is alcohol expenditure elasticity and the β_{jk} are the cross- and own price elasticities between the prices of the *m* beverages and Chilean wine, *j*. The ethical status demand shifters imply that demand for *j* will shift to the left if *j*'s ethical status falls to "not o.k.," ($\gamma_{jj} < 0$) or if the ethical status of another good rises to "o.k." ($\gamma_{jk} > 0$). The γ's may thus be thought of as "cross ethical status" elasticities. Returning to Stone's approach, we decompose the cross price elasticities using the Slutsky equation $\beta_{jk} = \beta_{jk}^{*} - \beta_j w_k$, where β_{jk}^{*} is compensated cross price elasticity and w_k is the expenditure share of the k^{th} good. This is substituted into (8).

$$\log X_j = \beta_0 + \beta_1 \{\log \sum^{N} M - \sum^{m} w_k \log p_k\} + \beta_2 N + \sum^{m} \beta_{jk}^{*} \log p_k + \sum^{m} \gamma_{jk} Unethical_l + \epsilon \qquad (9)$$

Expressing the sum of each good's expenditure share multiplied by its price as a general price index, *P*, (9) may be restated as:

$$\log X_j = \beta_0 + \beta_1 \log ((\sum^N M)/P) + \beta_2 N + \sum^m \beta_{jk}^* \log p_k + \sum^m \gamma_{jk} Unethical_l + \epsilon \qquad (10)$$

Next, from the condition that demand is homogeneous of degree zero in prices and expenditure, it can be shown that the sum of compensated cross-price elasticities $\sum \beta_{jk}^*$ equals zero. We may thus subtract the term $\sum B_{jk}^* \log P$ from (10), and so deflate prices by P.

Finally, two additions are included to reflect more recent practice in demand estimation. First, there is a possible dynamic effect from habit persistence over time for consumer goods like alcoholic beverages (Anderson and Blundell 1983). This shall be accounted for with a lagged consumption variable. Second, there is recent evidence that the demand for alcoholic beverages (and many other commodity groups) may be quadratic rather than linear in the log of expenditures (Banks, Blundell and Lewbel 1997).[4] Thus, in final form, demand for Chilean wine in Canada shall be estimated as:

$$\log X_{j,t} = \beta_0 + \beta_1 \log X_{j,t-1} + \beta_2 \log ((\sum^N M_t) / P_t) + \beta_3 (\log ((\sum^N M_t)/P_t))^2 +$$

$$\beta_4 N_t + \sum^m \beta_{jk}^* \log (p_{k,t}/P_t) + \sum^m \gamma_{jk} Unethical_{l,t} + \epsilon_t \qquad (11)$$

Prices p_k will include an (own) price index of Chilean wine in Canada, and three indices for Canadian domestic, Western European and American wines, respectively. Price indices are also constructed for other alcoholic beverages: domestic (Canadian) spirits, imported spirits, domestic beer, and imported beer. The unethical status variable for Chilean wines will shift from zero to one during the years of Chile's military dictatorship, 1974-1989. The ethical status of the alternative wines, spirits and beer (originating overwhelmingly in North America and Western Europe) shall be assumed to be

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[4] The latter finding, while simple to address, raises again the problematic issue of treating aggregate demand estimates as the simple sum of individual demand estimates.

unchanged during the entire 1964-1994 period, and so will not be included in the regression.

In a single equation, the disturbance term ϵ is assumed to be independent of all explanatory variables. Theoretically, this would not hold if price and quantity were determined simultaneously from a complete system of Canadian demand, Chilean supply, and an equilibrium condition (Greene 1997). In such a case, a simultaneous equations system would be used. Canada, however, is likely a price-taker historically in the world market for Chilean wine. It bought between 0% and 18% of Chile's wine exports between 1962 and 1994, or 5.4% on average. Thus, price shall be taken as given, and ordinary least squares (OLS) estimation shall be employed.

A concern has been raised that treating the price of Chilean wine as exogenous in Canada may confound the search for an ethical demand shift. That is, because many countries may have reduced demand, ethical effects may have already made themselves felt in a lower world price, reducing the effect that a shift variable specific to Canada could detect. However, if the world price for Chilean wine were depressed, whether from ethical concern or any other reason, the price effect would cause a movement *along* the Canadian demand curve. Any ethical effect in Canada would cause a *shift* in Canadian demand, whatever the world price. Thus the effects of world price and Canadian ethical concern are theoretically separable in this approach. It might, however, be the case that movements in world price and ethical status are highly correlated, which would make estimating separate price and ethical effects difficult. Fortunately, this can (and shall) be tested empirically.

Data. Regression variables use the following data. Quantity (X) and all price variables for wine imported to Canada are derived from Canadian-reported data in *United Nations Commodity Trade Statistics* (U.N. annual) for the commodity 112.1 "Wine of fresh grapes, etc." Prices were

constructed as simple ratios of total value over quantity, and thus ignore quality heterogeneity and the possibility of substitution between qualities of wine from a given source region. As mentioned, Western Europe and the United States provide the vast majority of imported wine for Canada (87.7% in the sample period), and so aggregate price series are included for each along with Chile. Price indices for Canadian domestic wine, as well as for domestic and imported beer and spirits, were similarly constructed from sales and quantity data from *The Control and Sale of Alcoholic Beverages in Canada* (Statistics Canada annual). The latter data were converted from fiscal to calendar year using weighted averages. Domestic wine sales data included sizable excise and federal sales taxes, and so these and customs tariffs were added to United Nations imported sales data (c.i.f.) before deriving imported wine prices.[5] Total expenditures on alcoholic beverages in Canada were also taken from *The Control and Sale of Alcoholic Beverages* and converted to calendar year. All prices and expenditures were then converted to Canadian 1986 dollars. Annual Canadian population data came from Statistics Canada Cansim Series D31248.

Diagnostics and Results. Table 1 presents the initial regression results. All non-binary variables are in logs. Three pair-wise correlation coefficients showed a high degree of positive correlation, exceeding .96. The correlation between the price of imported and domestic sprits was $r = .967$, and so a combined spirit price index was constructed and used in all regressions. More importantly, expenditures and squared expenditures were almost perfectly correlated $r = .999$), making it difficult to separate their individual influences on consumption. Thus, a quadratic expenditure term was retained in models (1) and (3), but dropped from models (2) and (4). Finally,

[5] Excise, customs and sales taxes come from McGoldrick's annual *Handbook of the Canadian Customs, Tariffs and Excise Duties.*

TABLE I
OLS REGRESSION RESULTS

	(1) Ln X	(2) Ln X	(3) Ln (X/N) Corrected for AR(3)	(4) Ln (X/N)
Intercept	-6891.9 (4479)	-160.33* (54.05)	-2594.6*** (464.5)	11.128 (19.89)
Lag(lnX)	.193 (.196)	.308 (.186)		
Lag(lnX/N)			.269*** (.068)	.540*** (.161)
ln ($p_{Chilean\ Wine}/P$)	-2.416*** (.677)	-1.970*** (.629)	-3.023*** (.282)	-2.289*** (.660)
ln ($p_{Canadian\ Wine}/P$)	.812 (4.519)	.046 (4.644)	3.150* (1.791)	1.111 (4.994)
ln ($p_{European\ Wine}/P$)	3.499** (1.467)	2.799* (1.439)	4.949*** .758	2.012 (1.501)
ln ($p_{American\ Wine}/P$)	.000 (.964)	.239 (.983)	-.147 (.415)	.473 (1.057)
ln ($p_{Canadian\ Beer}/P$)	7.357 (7.275)	-2.792 (2.802)	5.582*** (1.135)	1.687 (1.914)
ln($p_{Imported\ Beer}/P$)	-.356 (2.004)	.405 (2.006)	2.114* (1.130)	.479 (2.170)
ln($p_{Can.\ \&\ Imp.\ Spirits}/P$)	-6.494 (6.754)	1.010 (4.705)	-9.299*** (1.628)	-5.588 (3.735)
ln ($\sum M/P$	876.07 (584.6)	-2.650 (2.725)		
(ln ($\sum M/P$)^2	-28.036 (18.65)			
ln ($\sum M/PN$			921.67*** (164.9)	.005 (2.60)
(ln ($\sum M/PN$)^2			-81.479*** (14.64)	
ln N	6.599 (13.03)	20.053* (9.800)		

TABLE I ... CONTINUED

	(1) Ln X	(2) Ln X	(3) Ln (X/N) Corrected for AR(3)	(4) Ln (X/N)
Unethical	.652	-.063	.718*	-.511
	(.663)	(.478)	(.391)	(.461)
Adj. R^2	.960	.958	.988	.945
Obs.	30	30	30	30
ρ_1			-.983	
ρ_2			-1.030	
ρ_3			-.764	

*, **, *** refer to significance at the 10%, 5% and 1% levels, respectively.
Numbers in parentheses are standard errors.
Run on Shazam version 8.0

lagged consumption and population were highly correlated ® = .969), and so models (3) and (4) were estimated in per capita form. That is, per capita consumption was regressed on lagged per capita consumption, prices, and per capita expenditures both with (3), and without (4), a quadratic term. All four regressions omit observations for the years 1962 and 1963, because Canada did not report importing any Chilean wine until 1964.

Tests for autocorrelation were carried out using Durbin's alternative test (Davidson and MacKinnon 1993). That is, to test for an AR(x) process, OLS residuals were regressed on explanatory variables and residuals lagged up to the xth order. An F test was then conducted on the joint hypothesis that the coefficients on the x lagged residual terms were all equal to zero. Such tests were carried out for each model, checking sequentially for AR(1) up to AR(5) order autocorrelation.

Because Durbin's alternative test is valid only asymptotically, and I have only 30 observations, a null hypothesis rejecting an AR(x) process was rejected only at the 5% or 1% levels of significance. Using this criteria, only model (3) showed evidence of autocorrelation, and only of an AR(3) order. Thus, model (3) was corrected using an iterative Gauss-Newton algorithm as proposed by Pagan (1974), and it is these results that are reported in Table 1.[6] [7] A non-parametric runs test on the corrected residuals suggests that they are random (normal statistic .772).

Regarding data stationarity, Dickey-Fuller unit root tests (as described in Gujarati 1995) suggest that a few variables are stationary only with first-order differencing, and the rest with second-order differencing. Consistent with this, Dickey-Fuller tests on the residuals of cointegrating regressions for each model reject the null that the exogenous and endogenous variables are cointegrated. This raises the possibility that all four models' regression results are spurious. At the same time, however, the R^2 is far exceeded by the Durbin Watson d statistic for all four regressions. According to Granger and Newbold (1974), it would be the reverse result that would serve as a rule of thumb to indicate that spurious regression is occurring. While the inclusion of a lagged dependent variable in each model biases the d statistic towards 2, this would still make it less likely that the regression results are spurious.[8]

With the diagnostics completed, we can now address the central question of the paper. Is

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[6] The correction of model (3) for AR(3) serial correlation had some qualitative effects: $P_{\text{American Wine}}$ became negative but remained insignificant, $P_{\text{European Wine}}$ became significant at the 1% rather than 10% level, and $P_{\text{Canadian Beer}}$, $P_{\text{Imported Beer}}$ and the unethical dummy became significant at the 10% level.

[7] The effective sample size (30) does not permit a common factor restriction test as suggested by Davidson and MacKinnon (1993) to distinguish between model mis-specification and true AR(3) autocorrelation.

[8] Indeed, when the lagged dependent variable is omitted, the (unbiased) Durbin-Watson d statistic still far exceeds the R^2 for each of the four regressions.

there evidence of an ethical demand shift for Chilean wine in Canada?

Overall, the four regression results look plausible in the sign of the price and expenditure coefficients, but there is some instability in magnitudes. The coefficient on own-price of Chilean wine is uniformly negative, large, and significant at the 1% level across all four regressions. The coefficients on alternative wine prices are positive in 11 of 12 cases, with European wines having in general a larger magnitude than Canadian wines, which in turn exceed that of American wines. Only European wine price coefficients tend to be significant, however. Domestic and imported beer price coefficients are positive in 6 of 8 cases, but both are only significant in model (3), and the estimated magnitudes appear unstable. Perhaps more unsettling, the (domestic and imported combined) spirit price coefficient is negative in 3 of 4 cases, including the sole case where it is significant. Its estimated magnitudes also vary considerably.

When expenditures on alcoholic beverages are entered quadratically in models (1) and (3), the linear term is in both cases positive and very large. It is significant at 1% in (3), but misses significance in (1), with a p value of .15. The quadratic term is negative in both cases, but also only significant in (3). When the quadratic expenditures term is dropped in models (2) and (4), the coefficient on the linear term is no longer significant, and even becomes negative in model (2). Thus it is possible that Chilean wine is an inferior good among alcoholic beverages, and a (log) linear specification of expenditures is a correct specification. The results point more strongly, however, to Banks et al.'s (1997) finding that expenditures should be entered with a log quadratic term for goods such as alcoholic beverages. If so, this would imply that models (2) and (4) are mis-specified.

Of the other variables, the coefficient on lagged consumption (or per capita lagged consumption) is always positive and of a small magnitude. It is only significant in the per capita specifications, however. Population has a large, positive coefficient where it enters separately in (1)

and (2), but is only significant in model (2).

Despite some instability in estimated magnitudes, the regression results seem plausible enough that we may proceed to examine the unethical dummy variable. To my surprise (and disappointment), there is very little evidence of a negative shift in demand for Chilean wine in Canada during the years of Chile's military government. The coefficient on the unethical dummy variable is of uniformly small magnitude, and has the "wrong" sign in models (1) and (3). These are the models that include a quadratic expenditure term. The unethical coefficient is only significant at the 10% level in model (3) where is has the wrong sign.[9] As a first pass, it seems safe to say that a violent ethical demand shock is not emerging from the data.

Let us try a second pass. There is noticeable variation in the estimated price coefficients for Canadian and American substitute wines, imported or domestic beer, and spirits. In addition, none of these substitute prices are significant at any conventional level in Models (1), (2) or (4). Consistent with this, the joint test that these five price coefficients equal zero is not rejected for these models at any conventional significance level, though the test is rejected for (AR(3)-corrected) Model (3) at the 1% level. Thus, to conserve degrees of freedom with the small sample size, Models (1), (2) and (4) were re-estimated without the five mentioned price substitutes in Models (1'), (2') and (4'). The results are reported in Table 2.[10]

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[9] When model (3) is not corrected for AR(3) correlation, the unethical coefficient is still positive, but nowhere near significant.

[10] Analogous tests for autocorrelation, heteroscedasticity, and stationarity were conducted for models (1'), (2') and (4') as for the original regressions. There were identical findings of no order of autocorrelation at 5% or 1% levels, nor heteroscedasticity. Similarly, there was a lack of series stationarity and of cointegration, but the Durbin Watson d statistics far exceeded the R^2's.

TABLE II

OLS SHORTER REGRESSION RESULTS

	(1') Ln X	(2') Ln X	(4') Ln (X/N)
Intercept	-2799.7** (1198)	-96.868** (41.63)	-1.420 (12.20)
Lag(lnX)	.253 (.168)	.417** (.164)	
Lag(lnX/N)			.782*** (.063)
ln ($p_{Chilean\ Wine}/P$)	-2.056*** (.491)	-1.716*** (.508)	-2.125*** (.523)
ln ($p_{European\ Wine}/P$)	3.234*** (.922)	2.439** (.925)	1.710* (.954)
ln $(\sum M)/P$	337.15** (149.5)	-.240 (1.981)	
$(ln\ (\sum M)/P)^2$	-10.857** (4.810)		
ln $(\sum M)/PN$			.112 (2.159)
ln N	18.384*** (5.628)	10.185** (4.665)	
Unethical	.301 (.397)	-.206 (.355)	-.351 (.382)
Adj. R^2	.968	.962	.950
Obs.	30	30	30

*, **, *** refer to significance at the 10%, 5% and 1% levels, respectively.
Numbers in parentheses are standard errors.
Run on Shazam version 8.0

The coefficient estimates from the shorter regressions are broadly consistent with those from the longer, though with higher adjusted R^2's. The negative coefficient on (linear) expenditures in Model (2) remains, but it has a noticeably smaller magnitude, and remains insignificant. Once again, it appears that modelling expenditures quadratically as in (1) is preferable, save only for the high degree of correlation in the data.

More importantly, when we return to the ethical variable, the results are also similar. In each case, the estimated coefficient is small and insignificant. The sign is negative in only two of the three cases, as was the case with the corresponding longer regressions. Thus, the results of the second pass look much like the first; there is not significant evidence of an ethical demand shift.

Finally, what of the issue of correlation between the (exogenous) price of Chilean wine in Canada and its ethical status? Recall that separate estimates of price and unethical status effects might be hampered if the two variables were highly negatively correlated. That is, multicollinearity might be hiding the ethical effect. This explanation seems unlikely. The correlation between the price of Chilean wine and unethical status, at -.468, does not seem severe enough to prevent separate estimation of price and ethical effects. To investigate this further, all seven models were re-estimated with the Chilean price and ethical variable dropped in turn. Dropping the ethical variable had very little effect on the magnitude, sign or significance of the Chilean price coefficient in any model. Dropping the Chilean price variable had slightly greater effects on the ethical coefficients. While it remained consistently insignificant, the ethical coefficient reversed sign in Models (1), (3) and (1'). The magnitude of the ethical coefficients remained relatively low.

V. DISCUSSION AND CONCLUSION

This paper has attempted to find empirical evidence of ethical purchase behaviour in a private decentralized market. That is, it has sought evidence whether consumers reduce their willingness to pay for a private good purely because of changes in that good's perceived ethical status relative to

substitute goods. Ethical status judgements could potentially be made concerning the conditions under which a good is produced, or concerning externalities in its production (or consumption). The test case of Chilean wine consumption in Canada was chosen because it seemed to meet the requirements for ethical purchase behaviour identified in experimental and case study research. Historically, Chilean wine constituted a small share of consumer's expenditures, with many substitutes available. Wine buyers in Canada had to purchase Chilean wine publicly in liquor outlets, and were likely to be aware that it was Chilean in origin. Finally, Canadians in general received fairly widespread media coverage of conditions in Chile during its time of brutal military rule. Thus, I have attempted to give the hypothesis of non-strategic ethical purchase behaviour a "fair shot."

Taken in isolation, quantity trade flows appear to support the idea of an ethical demand shock. Despite a gradual increase in wine exports, the proportion of Chilean wine destined for Canada, the United States and Western Europe fell precipitously during the initial years of military rule, and increased again in the late 1980's as civilian rule was gradually restored. Conversely, the proportion of wine exported to the rest of South and Central America increased dramatically during the years of military rule, before falling again in the mid- and late 1980's.

Yet the evidence for an ethical demand shock in Canada appears to wither once we control for other variables thought to influence wine purchase decisions. With the price of Chilean and alternative wines taken into account, as well as the price of domestic and imported beer and spirits, total expenditures on alcohol, and lagged consumption, there is no longer evidence of any shift in demand for Chilean wine for the years 1974 to 1989. Across seven specifications with fairly plausible price and expenditure coefficients, the unethical dummy coefficient has a low magnitude, and the wrong sign in 3 of 7 cases. It approaches significance only once, with the wrong sign, in a regression corrected for AR(3) autocorrelation.

Thus while Canadians may have shunned Chilean wine once Chile fell to oppressive military rule, this appears to be explainable without recourse to ethical preferences. Relative prices and

overall expenditures on alcohol seem to have been sufficient to account for the fluctuations in trade flows.

A few caveats of interpretation seem in order. First, changes in wine quality were not controlled for in the highly aggregated price and quantity data used in the regressions. Thus, it is possible that Chilean quality improvements in the 1970's and early 1980's may have counter-acted negative demand shocks. Anecdotal evidence suggests, however, that modernizations improving quality consistency in Chilean viniculture began only in the early 1990's with capital raised from ballooning exports.

Secondly, the econometric estimates of some coefficients seem slightly unstable across specifications. In particular, estimated coefficients of some substitute prices changed sign, and in the case of beer and spirits varied by almost an order of magnitude. Coefficients were more stable, however, for prices found to be significant, such as own price and the price of European substitute wines. And the vast majority of coefficient signs were as expected.

Finally, one might ask whether the lack of evidence of a demand shift found here bodes ill for the hypothesis of ethical purchase behaviour in general. One could argue, for example, that wine purchasers are less beset by ethical purchase concerns than are consumers of other goods. Or, perhaps despite the many news reports, consumers were still uninformed about the conditions in Chile. Perhaps most significantly, some consumers may have had fully-informed ethical concerns about the Chilean *government*, but not associated these concerns with the ethical status of Chilean *goods*. Producer-specific ethical demand shifts might be more readily observable.

On the other hand, one could argue that if we do not find an ethical demand shock here, we are not much more likely to find it elsewhere. The initial coup, military abuses, and struggle for civilian rule in Chile received an unusual amount of attention in Canada, and consumers of wine are more likely to know its country of origin than are consumers of many other goods. In addition, wine is usually consumed socially, so that even if a purchaser does not have ethical purchase concerns, he

might not wish to consume it with others who do.

All that can be claimed is that this paper attempted to find *prima facie* evidence of an ethical demand shift in a decentralized private market, and did not find it. As an investigation of ethical purchase behaviour, it is only a start. Yet with the increase in international trade between countries with widely divergent human rights practices or production conditions, it is an investigation that seems well worth making.

REFERENCES

Alexander, R. J., *The Tragedy of Chile*, Contributions in Political Science, No. 8 (Westport, Conn.: Greenwood Press, 1978).

Amerine, M.A., AND V.L. Singleton, *Wine: an Introduction*, second edition (Berkeley: University of California Press, 1977).

Anderson, G., AND R. Blundell, "Testing Restrictions in a Flexible Dynamic Demand System: an Application to Consumers' Expenditures in Canada" *Review of Economic Studies*, 162, (1983), 397-410.

Andreoni, J., "Impure Altruism and Donations to Public Goods: a Theory of Warm-glow Giving" *Economic Journal*, 200, (1990), 464-477.

_____, "Cooperation in Public-goods Experiments: Kindness or Confusion," *American Economic Review*, 85, (1996), 891-904.

Banks, J., R. Blundell AND A. Lewbel, "Quadratic Engel Curves and Consumer Demand," *The Review of Economics and Statistics*, 79, (1997), 527-539.

Canadian Periodical Index, (Brampton, Ontario: Charters Publishing Company Limited, annual).

Cambell, R.H., AND A.S. Skinner, *Adam Smith* (London: Croom and Helm, 1982).

Davidson, R., AND J. MacKinnon, *Estimation and Inference in Econometrics* (New York: Oxford University Press, 1993).

Deaton, A., AND J. Muellbauer, *Economics and Consumer Behavior* (New York: Cambridge University Press, 1980, reprint 1996).

Eckel, C. C., AND P. Grossman, "Equity and Fairness in Economic Decisions: Evidence from Bargaining Experiments" in *Advances in Economic Psychology*, ed. G. Antonides, F van Raaij and S. Maital (New York: John Wiley and Sons, 1997).

Edwards, S., AND A.C. Edwards, "The Economy," in *Chile: a Country Study*, area handbook series (Washington: Federal Research Division of the Library of Congress, 1994).

Friedman, M., AND R. Friedman, *Free to Choose* (New York: Harcourt Brace Jovanovich, 1980).

Globe and Mail, The Toronto, "Made-in-China Label Raises Questions About Whether China has Exported Forced-labour Products to Canada" June 24, (1992),A15.

Granger, C.W., AND P. Newbold, "Spurious Regressions in Econometrics," *Journal of Econometrics*, 2, (1974), 111-120.

Greene, W.H., *Econometric Analysis*, third edition (Upper Saddle River, NJ: Prentice Hall, 1997).

Gujarati, D., *Basic Econometrics*, third edition (New York: McGraw-Hill, 1995).

Harbaugh, W.T., "What Do Donations Buy? A Model of Philanthropy and Tithing Based on Prestige and Warm Glow," working paper, Department of Economics, University of Oregon, December 2, 1996.

Harsanyi, J.C., "Individual Utilities and Utilitarian Ethics," in *Paradoxical Effects of Social Behavior: Essays in Honor of Anatol Rapoport*, ed. Andreas Diekman and Peter Mitter (Heidelberg: Physica-Verlag, 1986).

Hoffman, E., K. McCabe AND V. Smith, "Social Distance and Other-regarding Behavior in Dictator Games" *American Economic Review*, 86, (1996), 653-660.

Hoffman, E., AND M. Spitzer, "The Coase Theorem: Some Experimental Tests," *Journal of Law and Economics*, 25, (1982), 73-98.

Kahneman, D., J. Knetsch AND R. Thaler, "Fairness and the Assumptions of Economics," in *Quasi Rational Economics*, ed. R. Thaler (New York: Russell Sage Foundation, 1988a).

_____, _____, AND _____, "Fairness as a Constraint on Profit Seeking: Entitlements in the Market," in *Quasi Rational Economics*, ed. R. Thaler (New York: Russell Sage Foundation, 1988b).

Ledyard, J.O., "Public Goods: a Survey of Experimental Research," in *The Handbook of Experimental Economics*, ed. J. Kagel and A. Roth (Princeton NJ: Princeton University Press, 1995).

McGoldrick's *Handbook of the Canadian Customs, Tariff and Excise Duties*, co-published by Statistics Canada, annual.

Oppenheim, L.H., *Politics in Chile: Democracy, Authoritarianism, and the Search for Development* (Boulder, Colorado: Westview Press, 1993).

Pagan, A. R., "A Generalized Approach to the Treatment of Autocorrelation," *Australian Economic Papers*, 13, (1974), 267-280.

Reader's Guide to Periodical Literature (Unabridged), (New York: H.W. Wilson Company, annual).

Robard, T., *Terry Robard's New Book of Wine* (New York: G.P. Putnam and Sons, 1984).

Roth, A.E., "Bargaining Experiments," in *The Handbook of Experimental Economics*, ed. John Kagel and Alvin Roth (Princeton NJ: Princeton University Press, 1995).

Simon, A., *Wines of the World*, second edition, ed. Serena Sutcliffe (New York: McGraw-Hill, 1981).

Smith, A., *An Inquiry into the Nature and Causes of the Wealth of Nations*, ed. R.H. Cambell, A.S. Skinner and W.B. Todd (Oxford: Clarendon Press, 1976).

Smith, N. C., *Morality and the Market: Consumer Pressure for Corporate Accountability* (London: Routledge, 1990).

Statistics Canada, "The Control and Sale of Alcoholic Beverages in Canada," Catalogue 63-202, annual.

Stone, J. R. N., *The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-1938*, Vol. I (Cambridge: Cambridge University Press, 1954).

Theil, H., AND K.W. Clements, *Applied Demand Analysis: Results from System-Wide Approaches*, Vol. 7 of the Series on Econometrics and Management Sciences (Cambridge, Mass.: Ballinger Publishing Company, 1987).

United Nations, "Commodity Trade Statistics", Series D, Vols. 12-47, ST/ESA/STAT/SER.D, annual. Data extracted for "Canada-Imports" and "Chile-Exports" for commodity 112.1 Missing observations supplied by computer transmission from the Commodity Trade Statistics section of the Statistical Division of the U.N.

United States Congress "Chinese Forced Labor Exports to the United States," Joint Hearing before the Subcommittee on Economic Policy, Trade and Environment; International Security, International Organizations and Human Rights; and Asia and the Pacific. Committee on Foreign Affairs, House of Representatives, September 9, 1994.

Vitell, S.J., AND J. Muncy, "Consumer Ethics: an Empirical Investigation of Factors Influencing Ethical Judgements of the Final Consumer," in *Journal of Business Ethics*, 11, (1992), 585-597.

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