Undergraduate Economic Review

Volume 7 | Issue 1 Article 16

2011

The International Nature of Alcohol as Determined by a Cross-Country Analysis of Demographs and Pricing, 1995-2002

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Abstract

Few publications have attempted to tackle the nature of alcohol on a global level. Given its universal availability and the emerging amount of alcohol-related data, we explore the cross-country and cross-continent nature of alcohol. Similarly, the extremely visible global burden of disease attributed to consumption warrants its classification. Subject to available data, we find both relative price (incorporating income levels) and demographics of a nation to be the primary determinants of consumption and the effects of higher education and unemployment to be negligible. Further, we find the observed converging phenomenon of consumption rates to be attributable to the decreasing propensity to consume with age. Our results suggest alcohol is unclassifiable in the typical demand model as we observe more unresponsive price elasticity estimates as income rises, although more analysis needs to be performed once additional alcohol-related data is made available.

Keywords

alcohol, price elasticity, income elasticity, cross-country regression, fixed effects

Cover Page Footnote

*I would like to extend thanks first and foremost to Evgeny Yakovlev, Ph.D. candidate in the Economics department who effectively served as my mentor for the length of the semester. Not only do I consider him the foremost academic expert on alcohol in the department, but he is also a great guy and better teacher. I would also like to thank my advisor Prof. Yuriy Gorodnichenko for trusting me to undertake and finish this paper. Similarly, I would like to thank Prof. Roger Craine for hosting the thesis-writing class and also for trusting me to sort out my myriad hurdles in the Fall. Further thanks is in order for Jim Church of the UC Berkeley library system who promptly answered my data queries with invaluable data sets. If you want data, Jim is the guy. Finally, to The University of California at Berkeley, and in particular my peers and professors in the Economics department: Thanks for being innovative and motivating, at times even frustrating. Hey, you wouldn't be "Berkeley" otherwise.

The international literature on alcohol consumption is conspicuously sparse; where available, it draws solely from relatively affluent nations (Selvanathan et al). On a topic that has been nearly exhausted in the health and sociology realms, it remains peculiar why a more broad approach hasn't been applied to a commodity that economically defies classification and theoretically presents a fantastic puzzle to economists.

The empirical regularities across nations suggest the pervasiveness of alcohol use (given its availability) with ubiquitous consumption distributions. In light of this, it would make logical sense that there are factors that contribute to its universality. Namely, we should be able to infer that the correlates of consumption on a national level that we can observe should have some presence on an international level.

This isn't to suggest the literature does not identify existing global trends- for one, it has been well documented that alcohol consumption rates have been converging, unlike accompanying income levels (Babor *et al.* 2003). What is lacking is a clear picture of a set of inputs that allow one to consume at a particular level, while assuming there are a set of factors that conversely prevent one from attaining this desired level of consumption. Whether it be income, age, employment, etc., this paper will set out to uncover what draws people to the good that has puzzled economists for years, with strong policy and industry implications. This is in contrast to the vast amount of literature quantifying the global disease burden of alcohol and the litany of data on price and tax elasticity.

We begin our analysis by developing a preliminary model through cross-country regression using ordinary least squares (OLS), while then applying available panel data with temporal considerations, and controlling for inherent variability within the sampling process using the standard fixed-effects model. In this manner we hope to discern not only correlates of international alcohol consumption, but infer some degree of causality as well- the main deterrent being data restraints.

Our theory predicates on the previous cross-country economic work done on the subject, with consideration given to the established health and sociology literature. In this manner, we will address the argument that alcohol, universally, is an essential good- *ceteris paribus*, an individual will consume a fixed amount of alcohol in a relatively inellastic manner with regards to price. Economists debate this position with some noting it acts as any other good given the various estimates of its own-price elasticity. However, more recent research suggests some forms of alcohol (beer, wine) are irresponsive to price and accordingly are necessities[1].

Regardless, from a policy standpoint we must acknowledge that an over-indulgence in the good certainly has a negative economic impact in addition to its obvious societal impact, attributed to the high variability in consumption levels per person (Cook). This also would suggest that there exists an optimum level of consumption for the individual that can be generalized to the greater population. This indeed can be inferred from health studies suggesting a tangible increase in well-being directly attributed to moderate alcohol consumption and is further demonstrated by the alcohol-income trade-off suggesting increased levels of generated income associated with moderate (and interestingly, *heavy*) intake[2]. Of course, this position can be controversial, but the aim of this paper is to uncover the primary drivers of international consumption, not to take a moral high ground. Thus, on an international level, one could assume that subject to this optimal level, some countries are "over-performing" while others have yet to realize their optimal potential of consumption- or worse. The inference is left to the reader.

[1] S. Selvanathan, E. A. Selvanathan (2003) measure the average cross-country income elasticity of beer to be 0.66 in 10 sampled OECD countries.
[2] known formally as the "alcohol income paradox"

Therefore, the aim of this paper is such: to discern the nature of alcohol on an international level by looking at the relative importance of various correlates, specifically pricing, demographics, and education to address the correct classification of alcohol as a consumable good.

Literature Review

In developing an international model, we would do well first to reconcile intended theory with existing literature. In this manner, we will first turn our attention to existing global economic studies. We will then advance our review to the micro level, drawing from the fields of health and sociology to deduce correlates of consumption on the socio-economic level, while reviewing literature that will strengthen the argument for consumption optimality.

To begin any discussion of international alcohol consumption, we must revert to the seminal *Global Status Report on Alcohol* for the years of publication 1996 and 2004. Contained is the most comprehensive review of the existing literature and statistics available. Accordingly, we can associate some of the conclusions of these reports with our intended model.

As a review of alcohol as a consumable, we acknowledge that The *Global Status Report* highlights the economic costs of population level alcohol consumption through an examination of various factors. First and foremost, we can attribute our collective aversion to alcohol consumption to various aliments associated with consumption. Among these are an estimated 20-30% of esophageal cancer, liver cancer, cirrhosis of the liver, homicide, epileptic seizures, and motor vehicle accidents worldwide in addition to a direct causal relationship between consumption and more than 60 types of disease and injury. The World Health Organization (2000) notes, “alcohol consumption is the leading risk factor for disease burden in low mortality developing countries and the third largest risk factor in developed countries," resulting in approximately 4% of the global burden of disease and 3.2% (1.8 million) of annual deaths, ranking alcohol fifth of 26 risk factors examined. Similarly, the WHO notes alcohol abuse causes unquantifiable social problems, including problems related to the workplace, the family, and violence. Simply, problems associated with alcohol abuse have far higher prevalence than one would generally expect. For a comprehensive review of the global burden of alcohol abuse, see the *2004 Global Status Report on Alcohol*.

However, in monetary terms, in which the *Report* notes a lack consistency in measurement, the social and economic costs of alcohol abuse in the selected countries amounts to just a fraction of GDP in the range of 1-5%. This may be partially or fully offset by the contribution of the alcohol beverage industry to the gross domestic product, which was measured at nearly 3.5% in the United States for the year 2006[1] (with the implication that this equilibrium may induce further policy inaction in terms of a simple cost-benefit analysis).

Conversely, the benefits of moderate alcohol consumption have been long established in medical literature, and the medicinal properties of alcohol receive no less than 190 mentions in the Old and New Testaments of the Bible (Straus 1979). Although a few physicians may disagree, it is generally accepted that moderate drinkers enjoy better health and longer lives than heavy drinkers *and* abstainers. This effect is most pronounced in the reduction of coronary heart disease (Renaud, Lorgeril 1992), described as the *French Paradox* by Dr. Serge Renaud in 1991. Additional studies have revealed moderate drinkers experience fewer strokes, lower blood pressure, and are less likely to suffer hypertension, peripheral artery disease, Alzheimer's disease and the common cold. Further, a purely economic analysis of the health benefits of alcohol consumption, measured by the global burden disease (GBD) attributable to alcohol, reveals that

[1] Distilled Spirits Council of the U.S.

certain *patterns* of consumption had a beneficial influence on GBD, while the *average* volume tended to increase risk for several chronic aliments (Rehm 2003). For a comprehensive review on the benefits of alcohol on health see *An Overview of Health Risks and Benefits of Alcohol Consumption*.

Substantiating the claim that alcohol has an optimal level that maximizes health is the WHO's *International Guide for Monitoring Alcohol Consumption and Related Harm*, which ballparks a per capita figure of 8-10 liters of pure ethanol alcohol annually. A similar figure can be derived from the algebraic formula that multiplies the suggested 2 standard US drinks (~0.72 liters of 5% alc. beer, ~0.09 liters 40% alc. liqour, ~0.3 liters of 12% alc. wine) per day by the number of days in a year, adjusted for a suggested 25% reduction for females. This is calculated as 11.3 liters of pure ethanol annually. For ten sampled OECD countries that have suggested maximum daily limits (AUS, Austria, Czech Rep., Italy, Japan, Netherlands, Portugal, Spain, Sweden, Switzerland), the average daily limit for men is 26.7 grams (~0.028 liters pure ethanol) and 21.25 grams (~0.022 liters pure ethanol) for women, with an average of 23.975 grams (~0.025 liters pure ethanol) per day, 10.5 liters annually.

Turning our attention to a cross-country analysis, we now need to determine the nature of alcohol as a consumable good. Numerous studies have reported alcohol's similarity to any given consumable, with downward sloping demand and reported cross-country income elasticities in ten sampled OECD countries of 0.66, 0.95 and 1.48, in 2006 (Selvanathan 2006) for beer, wine, and spirits respectively. In all countries the demand for beer, wine and spirits was determined to be price inelastic. The cross-country average own-price elasticities for beer, wine and spirits are 0.19, 0.30 and −0.31, respectively. The study cited noted its relative accuracy with past figures. However, the author makes the argument that these elasticities are indicative of the qualification of alcohol as a necessity, as opposed to a normal good. We must also address the variation in estimated elasticities across countries, and the usage of these results in a refutation of Stigler and Becker's (1977) identical tastes hypothesis. This indeed should be duly noted in any consideration of policy.

In health economics, there has been strong evidence that drinking problems are highly correlated with per capita consumption of alcohol (Smart et. al 2000, Rehm 2003). However, the distribution of consumers within a population is estimated to approximate the highly right-skewed lognormal distribution (Edwards et al 2004), with the upper decile of the population consuming more than the other 90% combined in the US (Gerstein 1981). Despite this distribution, there is still strong incentive to enact a population-wide reduction in per capita consumption as the consumption of each quartile tends to fall in proportion with the overall reduction (Edwards et al 1994). This consumption distribution has been shown to exist almost ubiquitously on the international stage (Cook, Moore 2000) and is unlikely to be altered on a country-by-country basis given the sometimes-addictive qualities of the good.

The existing literature however should prove rather exciting in that one can deduce on an international level that although affinity towards alcohol varies culturally, the rather homogenous distributions and similar classification (in elasticity measures) in the developed world gives credence to the analysis of alcohol consumption on the international, cross-continent level.

Uncovering Correlates

Utilizing the existing literature as well as intuition, we begin a discussion of the hypothesized major determinants of consumption. The following arguments have been bulleted for ease of reference:

-Irrespective of elasticity measures, we would generally expect the price of alcohol to have a quantifiable effect on consumption levels. This arises from the intuition that a beverage priced at 0 units of currency would have a demand approaching infinity and a beverage priced at infinite units of currency would have no demand. This provides us a basis to be expounded upon.

-Further, we would assume one's income would aid in determining his consumption: this can alternately be controlled by adjusting prices relative to incomes.

-From the literature (Cook, Moore 2000), it can be assumed consumption is also subject to demographics, in particular age and gender, as men are more likely to be drinkers and women abstainers, similarly with older age groups versus young adults (Babor et. al 2003).

-Further, social and legislative blocks prevent certain demographics from consuming. This is pronounced in the near-universal social norm of alcohol consumption commencing at a certain age as well as law preventing consumption of mind-altering substances (including alcohol) in various nation-states.

-As numerous studies cite 'sociability' as a reason for drinking, especially among young adults, we might deduce that the amount of time spent in social activity would have an important role in alcohol consumption. Alternatively stated, the amount of time not spent in productivity might figure into alcohol consumption, denoted by unemployment.

-Various studies report education as a strong determinant of alcohol consumption (Cook).

-From a marketing standpoint, we might expect advertising to have an effect on consumption. However, Nelson and Moran (1995), Gius (1996), and various other studies report a negligible effect of overall advertising on aggregate consumption.

Therefore, our preliminary model is as follows: we expect that the total consumption of alcohol on a per capita basis is explained by: a. the price of alcohol, b. income per capita, c. the demographic makeup of the population, d. availability of alcohol to the average consumer, e. the amount of leisure time (sociability) available to the average citizen and f. the educational attainment of the average citizen.

$$(1) \quad cons. = f(price, income, demographics, sociability, education)$$

Data

For the first regression, we derive the majority of our data from the World Health Organization's (WHO) Global Alcohol Database, the penultimate resource for alcohol-related data. The dependent variable in our regression, consumption, is determined by the measured amount of alcohol consumption (in pure ethanol) per person in liters. This takes various forms; for the sake of this paper, we choose the recorded estimated consumption per person as the most reliable data on the relative amount of consumption. Thus, when we utilize the fixed-effects model, we assume the amount of unrecorded alcohol consumption is constant across time and measure the change in the *recorded* consumption. This is due to: 1. Rehm and Gmel's (2001) estimates that the amount of unrecorded alcohol has been constant since the year 1995 and 2. the absence of data available since this survey was performed.

Similarly, we derive the price data from the database. This has been standardized to the US dollar and is measured best by the price of a standard 500mL beer- the beverage most likely to be replaced by a non-alcoholic substitute, such as a soda pop and the most widely available form of alcohol. Further, the correlation between the price of cheap wine and spirits in the database is systematically strong and the price of beer will be the best indicator of relative alcohol prices worldwide.

Income data is also taken from the WHO, and is measured in gross national product per capita (gnpPC) adjusted for purchasing power parity in US dollars.

The demographics of the population are best approximated by the median age of the population, the ratio of men to women, and the percentage of the population claiming Islam as a practiced religion, as practicing Muslims are barred from alcohol consumption in most parts of the world. This data is taken from the WHO, and the data on Muslim population estimates is taken from the CIA World Factbook.

Sociability, which agreeably is difficult to quantify, is measured in this model by average amount of annual hours worked per worker, or alternatively measured by number of paid vacation days mandated by the government. This data was taken from the OECD website and the International Labor Organization (ILO). We leave debate on the appropriateness of these statistics to the reader. We include the unemployment rate of the male demographic in the 15-24 age range, available from the UN.

Finally, we derive the education correlate from the WHO, using the percentage of population enrolled in tertiary (college, professional) education and the proportion of women to men in secondary (high school) education. The latter statistic also is a strong indicator of the gender equity within a country (and is a large component of the gender parity index, or GPI) and thus might be indicative of equality in social situations.

A NOTE ON DATA AVAILABILITY

The primary deterrent to a full analysis of our hypothesized models is the lack of complete data. The WHO Global Alcohol Database commenced in 1997, and accordingly lacks archived data- namely, panel data for alcohol prices. While this effectively limits inference, we do our best to work around the constraints, using panel data where available. (It should be noted that more accurate analysis should be available as data is collected. At the time of this writing, data is available up until the year 2003).

Methods and Models

We derive our primary equation using the method of ordinary least squares. This provides us with correlates we will pass to panel-data analysis. We thus begin with a model of the following form:

$$(2) \qquad y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \ldots + \beta_k x_{ik} + \varepsilon_i$$

For equation one, we derive the specific form:

$$(3) \quad y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \beta_4 x_{i4} + \beta_5 x_{i5} + \beta_6 x_{i6} + \beta_7 x_{i7} + \beta_8 x_{i8} + \beta_9 x_{i9} + \varepsilon_i$$

y_i = avg. total consumption (recorded, unrecorded) per capita (liters), 2002

x_1 = price (in $US) relative to gnpPC (ppp, $US), 2002

x_2 = median age of population, 2002

x_3 = ratio of women to men, 2002

x_4 = percentage Muslim, 2002

x_5 = GPI secondary education, 2002

x_6 = gross tertiary enrollment ratio, 2002

x_7 = minimum mandated paid holidays per year

x_8 = average annual hours worked per employee

x_9 = unemployment of males, 15-24 years, 2002

We drop x_5 and x_7- *GPI* and *holidays* from the model to avoid data availability bias. Further, x_4 is omitted in (3) due to data availability- hours worked is available only for 29 countries that are typically affluent and OECD affiliated- the formal sector employment in these nations outweighs the informal sector and thus such statistics can be kept. Although we observe a negative coefficient on the *hoursworked* parameter, we omit the variable for the purpose of an international perspective. Similarly, the small sample size substantially reduces the significance of our parameters. We run the regression again for 51 nations of the following form, accounting for dropped variables by using the robust version of OLS:

$$(4) \quad y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \beta_4 x_{i4} + \beta_5 x_{i5} + \beta_6 x_{i6} + \beta_7 x_{i7} + \varepsilon_i$$

y_i = avg. total consumption (recorded, unrecorded) per capita (liters), 2002

x_1 = price (in $US)

x_2 =gnpPC (ppp, $US), 2002

x_3 = median age of population, 2002

x_4 = ratio of women to men, 2002

x_5 = percentage Muslim, 2002

x_6 = gross tertiary enrollment ratio, 2002

x_7 = unemployment of males, 15-24 years, 2002

Under this model, we can now determine the relative importance of price, demographics, and education in determining consumption. We drop unemployment due to its marginal economic significance, measured at 0.03L per person in the sample, statistical insignificance, and limited data availability. Given the strictly positive nature of price and income, and the hypothesized quadratic forms, we generate for 83 nations:

$$(5) \quad y_i = \beta_0 + \beta_1 \log(x_{i1}) + \beta_2 \log(x_{i2}) + \beta_3 x_{i3} + \beta_4 (x_{i3}{}^2) + \beta_5 x_{i5} + \beta_6 x_{i6} + \beta_7 x_{i7} + \varepsilon_i$$

y_i = avg. total consumption (recorded, unrecorded) per capita (liters), 2002

x_1 = price (in $US)

x_2 =gnpPC (ppp, $US), 2002

x_3 = median age of population, 2002

x_5 = ratio of women to men, 2002

x_6 = percentage Muslim, 2002

x_7 = gross tertiary enrollment ratio, 2002

While equation 5 lacks the panel data to perform panel analysis, we have sufficient data to regress the changes over a 5 year period (1995-2000) in our statistically significant indicators in equation 5 against changes in consumption. We apply panel data to the standard fixed effects model- appropriate on the international level given the inherent non-random nature of our data. Although panel data on pricing is not available, we do not lose too much credibility by assuming the variability in relative pricing can partially be captured by the changes in gnpPC over the time period. Thus, we have the standard model:

$$(6) \quad y_{it} = \beta_0 + \delta_0 d2_t + \beta_1 x_{it} + a_i + u_{it}, t = 1,2$$

-We pass the statistically significant (and available) correlates from equation 4 to 5:

$$(7) \quad y_{it} = \beta_0 + (\delta_0 d2000_t) + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + a_i + u_{it}, t = 1995,2000$$

y_{it} = avg. total consumption (recorded, unrecorded) per capita (liters)

x_{1it} = gnpPC (ppp, $US) in thousands

x_{2it} = median age of population, 2002

x_{3it} = tertiary enrolment, 2002

a_i = country fixed effect

Results

An OLS regression from equation 3 returns a vector of only 24 nations, mostly from the OECD, as per data availability and mentioned above. It is suggested that inference from these statistics be taken with caution- for the sake of the international perspective of this paper, we would do well to ignore the results of this regression.

Conversely, running the least squares regression for equation 5 (accounting for correlation among errors) measures the relative importance of demographics, price, and education across 69 countries representing all continents in determining total alcohol consumption. We find that 70% of the variation in consumption is explained by the variation in the independent variables, as given by the R-squared value (regression 5a). We also find that when controlling for these variables, that only the natural log of gnpPC and price are statistically significant at the 5% level. The effect of the women-to-men ratio seems to be negligible with a p-value of 0.38 after age has been partialed out. We note however the coefficient in the model is positive, and the large variation in the estimate of the parameter can be partially attributed to the low variation in the data of the variable itself.

When we drop two specific outliers from the model (regression 5b)- Ireland (a country who consumes twice as much alcohol per capita than predicted from the model) and Burundi (whose method of data collection has varied over the two main surveys given by the WHO), we find age to become marginally significant at the 10% level.

Finally, when we drop the women-to-men ratio altogether (regression 5c), justified by a p-value approaching 0.5, we reduce our R-squared by 7% to approximately 64% but increase the sample size to 83 nations (including Ireland and Burundi), and obtain highly significant estimates on median age squared, the Muslim majority dummy, and price and income at the 5% level, with marginal significance of age at the 10% level, not entirely unexpected given the higher significance of this value squared.

In this model (5c) we control for educational attainment, price and income, and demographics denoted by age and Muslim majority and thus can infer comparison between the three in explaining consumption variation. We find higher educational attainment to be economically insignificant (-0.008) and statistically indifferent from zero (F-stat: 0.627). On the contrary, the population parameter on the Muslim majority dummy is measured at approximately -1.9L with a standard deviation of 0.84L. The age component of demographics is found to have a quadratic effect on consumption- negative and increasing, given by the -0.76 parameter estimate on age and +0.016 parameter estimate on age squared. The interaction of the two estimates gives a turn-around value given by:

$$x^* = \left| \beta_3 / (2\beta_4) \right|$$

This is interpreted as a bottoming-out effect at a median population age of ~24.2 years and increasing and accelerating as age approaches infinity.

The semi-elasticity estimate on income is significant at 1% and is measured at .185L increase in consumption per 10% increase in income. Similarly, the semi-elasticity estimate on price is negative and estimated at -1.35, or -.135L per 10% increase in nominal price.

The pure elasticity estimates are given by regression 5d and are estimated at 0.507 for income elasticity and -0.49 for price elasticity.

What is noteworthy is that we find vastly different price-elasticity estimates for nations separated by income; specifically, a -0.75 income elasticity for nations earning less than $7,500 (US) and -0.21 elasticity for nations earning more that $7,500 (US).

When we pass the price, education, and demographic parameters to fixed-effects model, we have a trade-off in the model where we sacrifice the unobserved variation in nominal price and unrecorded amounts of consumption for increased sample size. Accordingly, we observe the statistical significance of the changes in age in quadratic form at the 1% level as well as income measured in gnpPC at the 5% level- both age and income having a positive effect on consumption and the squared effect of age being negative. We also note the insignificance of the variation in the female to male ratio over time and tertiary education levels. A closer look at the changes in female-to-male ratio over the five year period reveal very little variation, thus its inclusion in a fixed-effects model is inappropriate. Further, we find the joint inclusion of the income and age variables in the model to be significant at the 5% level with an observed p-value of 0.0125. It must be pointed out that the effect of the change in age is measured at nearly 5 times the size of the coefficient on change in gnpPC in the sample, with a 95% confidence interval on age covering ~0.22 to ~1.98, compared with an interval covering ~0.07 to ~0.36 for income. Note that the Muslim component of demographics was omitted from the endogenous portion of the regression- passing its effect into the fixed effect variable as we would expect this composition to vary little over time as well.

Interpretation

From equation 5, we find that when we regress recorded average consumption on educational attainment, demographic variables, and price as determined by the nominal price and gross national product per capita, educational attainment has no measurable effect in predicting consumption. This, on the international stage at least, would seem to contradict the extension of the common conception in the United States to other nations that a measurable increase in consumption occurs in college-bound persons. Further, the demographic statistic measuring the ratio of females to males in a population is insignificant, although in the sample it is slightly positive, indicating an increase in consumption associated with a ratio shift in the females favor. More data is necessary to substantiate this observation.

Conversely, we find nominal price, income per capita, and median age squared to be statistically and practically significant at the 5% level when controlling for majority Muslim nations, and the p-value on median age to be 0.087. This suggests that relative price of alcohol is a highly accurate predictor of consumption levels when income is accounted for. Similarly, demographics of a nation when measured by the median age of the population are also a highly accurate predictor of consumption rates. This latter effect is best approximated by a concave, increasing quadratic.

The observed income elasticity estimate, estimated at 0.507 cross-country is generally consistent with past cross-country income elasticity estimates of beer pricing among OECD nations. The observed price elasticity estimate, estimated at -0.49, is more elastic than observed in OECD nations. However, we also observe different estimates of elasticities at different income levels. For nations with gnpPC less than $7,500 (US) our price elasticity estimate is -0.75 and for nations earning more that $7,500 (US) the estimate is considerably more inelastic, at -0.21. This suggests income elasticity is dependent on a quadratic form, although the statistical significance of both these estimates is reduced to p= 0.044 and 0.092 respectively (regressions 5e, 5f). From these estimates, we might deduce that the classification of alcohol as a necessity is dependent on age and income- with alcohol becoming a necessity for higher income, higher aged nations.

Passing these variables to a fixed effects model substantiates our observation from the least-squares model that *both* demographics and relative pricing are significant in determining changes in measured amounts of consumption. In fact, we measure the effect of an added year in the median population to outweigh the effect of a one thousand dollar increase in income by a nearly seven-fold factor. Further, we observe a slightly decreasing effect of age as the median age approaches the upper bound.

We can interpret the significance of this observation as median age having a positive but decreasing effect on consumption levels. This accounts quite nicely for the observed converging levels of consumption- typically high consuming countries such as those in the OECD have experienced reduced levels of consumption over the past twenty years, accompanied by a gradual demographic transition from stage four (constant replacement) of the demographic transition model (DTM) to, in some cases, stage five (sub-replacement). Similarly, typically low consuming nations (AFR) that are experiencing stage two (exponential) growth have seen accompanying rises in consumption levels. While policy is not an aim of this paper, the point must be made that various estimates of the consumption of some of these stage-two nations (Uganda, Burundi, Nigeria, Swaziland) are already above optimal (~10.0 liter) levels.

Further, the observation that the demographic make-up of a nation is important- if not more important than relative pricing as measured by change in income- strengthens Selvanathan et al's claim that alcohol may indeed be a necessary good- necessary at least to middle-aged adults in population-wide terms.

Finally, the determination that an increasing age and increasing income accompany increasing consumption should provide some beverage industry implications for emerging markets. The morality of this is left up to the reader.

Conclusion

In this paper, we derived the strongest correlates of alcohol consumption internationally, focusing on education, price, and demographics as determinants using least-squares models. From our estimated regressions, we found that demographics and pricing are jointly significant in explaining the variation of consumption over time, with median age of the population being the dominant statistic. We also explore the possibility that alcohol as a good transforms from normal to necessity as income and age increase. Further research and data is necessary to determine the true strength of the demographic transitions of nations and alcohol consumption, but from the perspective of this paper, we reveal that the nations at greatest risk for alcohol-associated problems are indeed developing nations given the strong correlation of total volume and alcohol-related mortality. On the flip-side, we may observe a mediation of the traditionally visible negative externality of consumption in the developed world. This substantiates the observation of converging alcohol consumption rates and at the least provides an interesting corollary to the argument that alcohol is indeed a necessity.

References

Alcoholism: Clinical and Experimental Research (2010) Research Society on Alcoholism. Volume 22 Issue S7, Pages 285s - 298s

Babor et. al (2003) Alcohol: No Ordinary Commodity—Research and Public Policy. Oxford and London: Oxford University Press.

Cook PJ, Moore MJ (2000) Alcohol. Handbook of Health Economics. North-Holland.

Edwards G (2004) Alcohol Policy and the Public Good. Addiction, Vol. 92, Issue 3s1, 73-80.

Gerstein DR, Moore MH (1981) Alcohol and Public Policy; Beyond the Shadow of Prohibition. National Academy Press, Washington D.C. 1981.

Gius MP (1996) Using panel data to determine the effect of advertising on brand-level distilled spirits sales. Journal of Studies on Alcohol, Vol. 57 pp.73 - 76.

Global Status Report: Alcohol Policy (2004) World Health Organization, Geneva, 2004.

Global Status Report on Alcohol (1999) World Health Organization, Geneva, 1999.

Global Status Report on Alcohol (2004) World Health Organization, Geneva, 2004.

International Guide of Monitoring Alcohol Consumption and Related Harm (2000) World Health Organization

Nelson, J.P., Moran, J.H. (1995), "Advertising and US alcoholic beverage demand: system-wide estimates", Applied Economics, Vol. 27 pp.1225-36.

Rehm J, Gmel G (2001) Alcohol per capita Consumption, Patterns of Drinking and Abstention Worldwide after 1995. European Addiction Research 2001; 7: 155-157.

Rehm J, Gmel G, Sempos CT, Trevisan M (2003) Alcohol-Related Morbidity and Mortality. Alcohol Research $ Health, Vol. 27, 2003.

Renaud S, de Lorgeril M (1992) Wine, alcohol, platelets, and the French paradox for coronary heart disease. Lancet. 1992 Jun 20;339(8808):1523-6.

Selvanathan EA (1991) Cross-country alcohol consumption comparison: an application of the Rotterdam demand system. Applied Economics, 1991, 23, 1613-1622.

Selvanathan EA, Selvanathan S (2005) Empirical Regularities in Cross-Country Alcohol Consumption. The Economic Record, Vol 81 , No. 255, August, 2005, S128–S142.

Selvanathan EA, Selvanathan S (2006) Another look at the identical tastes hypothesis. Springer-Verlag 2006 .

Smart RG, Suurvali HM, Mann RE (1999) Do Changes in Per Capita Consumption Mirror Changes in Drinking Patterns? J. Stud. Alcohol 61: 622-625, 2000

Stigler G, Becker G (1977) De Gustibus non est: disputandum. Am Econ Rev 67:76–90

Straus, R (1979) An historical perspective on the clinical uses of wine. Vintage, August, 1979. Referenced in Ford, G. The Benefits of Moderate Drinking: Alcohol, Health and Society. San Francisco, California: Wine Appreciation Guild, 1988, p. 20.

Thakker KD (1998) An Overview of Health Risks and Benefits of Alcohol Consumption. Alcohol Clinical Exp Res. 1998 Oct;22(7 Suppl):285S-298S.

Appendix:

Regression 5a:

Linear regression

Number of obs	=	68
F(7, 60)	=	35.39
Prob > F	=	0.0000
R-squared	=	0.7052
Root MSE	=	2.2452

recorde~2002	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
womento~2002	.0532892	.0599396	0.89	0.378	-.0666079	.1731863
tertiar~2002	-.0164118	.0182194	-0.90	0.371	-.052856	.0200324
age2	.0094701	.0077034	1.23	0.224	-.0059391	.0248792
age_2002	-.4415772	.4607857	-0.96	0.342	-1.363286	.4801315
lnprice	-1.51323	.6308755	-2.40	0.020	-2.775169	-.2512912
lninc	2.64043	.52414	5.04	0.000	1.591994	3.688867
muslim_maj~y	-1.086072	.9281395	-1.17	0.247	-2.942627	.7704836
_cons	-18.58372	9.070717	-2.05	0.045	-36.72786	-.439586

Regression 5b (omiting Ireland, Burundi):

Linear regression

Number of obs	=	67
F(7, 59)	=	37.57
Prob > F	=	0.0000
R-squared	=	0.7341
Root MSE	=	2.094

recorde~2002	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
womento~2002	.0438119	.0621082	0.71	0.483	-.0804663	.1680901
tertiar~2002	-.0157777	.01839	-0.86	0.394	-.052576	.0210205
age2	.0125896	.0072383	1.74	0.087	-.0018943	.0270734
age_2002	-.6184516	.4366863	-1.42	0.162	-1.492259	.2553556
lnprice	-1.846166	.575183	-3.21	0.002	-2.997105	-.6952278
lninc	2.635651	.5268459	5.00	0.000	1.581435	3.689868
muslim_maj~y	-.8392022	.8693705	-0.97	0.338	-2.578809	.900404
_cons	-15.51114	8.735521	-1.78	0.081	-32.99088	1.968593

Regression 5c. (education / demographs / price, income ; robust):

Linear regression

Number of obs	=	83
F(6, 76)	=	24.22
Prob > F	=	0.0000
R-squared	=	0.6370
Root MSE	=	2.4354

consump~2002	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]

```
tertiar~2002 |  -.0088906   .0182363    -0.49   0.627    -.0452114    .0274302
        age2 |   .0158115   .0074674     2.12   0.037     .0009389     .030684
    age_2002 |  -.7642179   .4413647    -1.73   0.087    -1.643272     .114836
     lnprice |  -1.356209   .5468632    -2.48   0.015    -2.445382   -.2670367
       lninc |   1.854822   .6124276     3.03   0.003     .6350663    3.074577
muslim_maj~y |  -1.896374   .8379704    -2.26   0.026    -3.565337   -.2274117
       _cons |  -2.450076   6.797583    -0.36   0.720    -15.98864    11.08848
------------------------------------------------------------------------------
```

QuickTime™ and a
decompressor
are needed to see this picture.

Residuals vs. Fitted Values, regression 5c

Regression 5d (elasticity estimates):

```
Linear regression                                      Number of obs =      82
                                                       F(  6,    75) =   15.97
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.5827
                                                       Root MSE      =  .72861

------------------------------------------------------------------------------
             |               Robust
      lncons |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
tertiar~2002 |   .0046028    .004365     1.05   0.295    -.0040927    .0132982
         age |   .0020997   .0021233     0.99   0.326    -.0021302    .0063296
    age_2002 |  -.1144225   .1367567    -0.84   0.405    -.3868558    .1580108
```

```
       lninc |   .5067399   .1833541     2.76   0.007     .1414797        .872
     lnprice |  -.4924052   .1604132    -3.07   0.003    -.8119648   -.1728457
muslim_maj~y |  -1.266915   .5719277    -2.22   0.030    -2.406254   -.1275771
       _cons |     1.6567   1.792135     0.92   0.358    -1.913417    5.226816
------------------------------------------------------------------------------
```

Regression 5e (elasticity estimates, gnpPC < 7500):

```
. regress lncons tertiaryenroll_2002 age_2002 age2 lninc lnprice muslim_majority if
gnppc_2002 < 7500

      Source |       SS       df       MS              Number of obs =      44
-------------+------------------------------           F(  6,    37) =    3.85
       Model |  21.7344643     6  3.62241071           Prob > F      =  0.0044
    Residual |    34.77446    37  .939850272           R-squared     =  0.3846
-------------+------------------------------           Adj R-squared =  0.2848
       Total |  56.5089243    43  1.31416103           Root MSE      =  .96946

------------------------------------------------------------------------------
      lncons |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
tertiar~2002 |   .0089772   .0139331     0.64   0.523    -.0192539    .0372083
    age_2002 |  -.0332439   .2621543    -0.13   0.900     -.564419    .4979312
        age2 |   .0001328   .0046793     0.03   0.978    -.0093483    .0096139
       lninc |   .4829753   .2916783     1.66   0.106     -.108021    1.073972
     lnprice |   -.746836   .3573417    -2.09   0.044    -1.470879   -.0227929
muslim_maj~y |  -1.256853   .4677716    -2.69   0.011    -2.204648   -.3090577
       _cons |   .6664103   3.278573     0.20   0.840     -5.97661     7.30943
------------------------------------------------------------------------------
```

Regression 5f (elasticity estimates, gnpPC > 7500):

```
. regress lncons tertiaryenroll_2002 age_2002 age2 lninc lnprice muslim_majority if
gnppc_2002 > 7500

      Source |       SS       df       MS              Number of obs =      38
-------------+------------------------------           F(  6,    31) =   10.67
       Model |   6.7081849     6  1.11803082           Prob > F      =  0.0000
    Residual |  3.24894006    31  .104804518           R-squared     =  0.6737
-------------+------------------------------           Adj R-squared =  0.6106
       Total |  9.95712496    37  .269111485           Root MSE      =  .32374

------------------------------------------------------------------------------
      lncons |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
tertiar~2002 |  -.0006867    .003177    -0.22   0.830    -.0071661    .0057928
    age_2002 |   .0915926   .1708583     0.54   0.596    -.2568752    .4400604
        age2 |  -.0006691   .0025848    -0.26   0.797    -.0059408    .0046026
       lninc |   .1846215   .1591914     1.16   0.255    -.1400515    .5092945
     lnprice |  -.2112823   .1213394    -1.74   0.092    -.4587556    .0361909
muslim_maj~y |  -1.252973   .3842352    -3.26   0.003    -2.036626   -.4693203
       _cons |  -.8050014   2.649941    -0.30   0.763    -6.209591    4.599589
------------------------------------------------------------------------------
```

Regression 6a:

```
Fixed-effects (within) regression               Number of obs      =       258
Group variable: country_id                      Number of groups   =       152
```

```
R-sq:  within  = 0.1285                         Obs per group: min =         1
       between = 0.2601                                        avg =       1.7
       overall = 0.2355                                        max =         2

                                                F(5,101)           =      2.98
corr(u_i, Xb)  = -0.7343                        Prob > F           =    0.0150

------------------------------------------------------------------------------
   recorded_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        age_ |   1.104555   .4445068     2.48   0.015     .2227736    1.986337
       age2_ |  -.0266332   .0084441    -3.15   0.002     -.043384   -.0098825
    gdpthou_ |   .2162779   .0715344     3.02   0.003     .0743728     .358183
tertiaryedu_ |   -.005694   .0159293    -0.36   0.721    -.0372935    .0259054
 femalemale_ |   .0966498   .1761421     0.55   0.584    -.2527688    .4460684
       _cons |  -15.57808   18.55262    -0.84   0.403    -52.38148    21.22532
-------------+----------------------------------------------------------------
     sigma_u |  5.2213818
     sigma_e |  .92825344
         rho |  .96936283   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(151, 101) =    12.64            Prob > F = 0.0000
```

Regression 6b (omitting insignificant vars):

```
Fixed-effects (within) regression               Number of obs      =       314
Group variable: country_id                      Number of groups   =       159

R-sq:  within  = 0.0688                         Obs per group: min =         1
       between = 0.1785                                        avg =       2.0
       overall = 0.1739                                        max =         2

                                                F(3,152)           =      3.74
corr(u_i, Xb)  = -0.6658                        Prob > F           =    0.0125

------------------------------------------------------------------------------
   recorded_ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        age_ |   1.006866   .3760118     2.68   0.008     .2639814     1.74975
       age2_ |  -.0225094    .007193    -3.13   0.002    -.0367206   -.0082982
    gdpthou_ |   .1515697   .0633165     2.39   0.018     .0264756    .2766638
       _cons |   -6.19124   5.007744    -1.24   0.218    -16.08501     3.70253
-------------+----------------------------------------------------------------
     sigma_u |  4.9482348
     sigma_e |  .93490036
         rho |  .96553348   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(158, 152) =    17.62            Prob > F = 0.00
```

Table 1, Regression 5 (all):

country_name	consumption	nominal price	gnpPC (thousands)	GPI secondary edu	tertiary enroll rate
Afghanistan	0.01	.	.	.	.
Albania	2.06	.	4.48	0.93	15.80
Algeria	0.16	1.91	4.75	1.05	17.81
Angola	3.88	.	2.33	0.83	0.85
Antigua and Barbuda	5.45	.	11.28	.	0.00
Argentina	8.6	0.65	7.36	1.03	61.14
Armenia	1.44	0.43	2.75	1.06	26.46
Australia	9.17	1.29	28.94	0.97	76.48
Austria	11	0.66	29.98	0.95	47.40
Azerbaijan	4.95	0.61	2.63	0.97	15.90
Bahamas	9.94	.	.	1.05	.
Bahrain	7.13	.	25.32	1.09	.
Bangladesh	0	.	0.92	1.11	6.04
Barbados	.	.	.	1.00	.
Belarus	6.24	0.27	5.94	1.04	58.16
Belgium	10.64	.	28.63	1.12	59.82
Belize	6.77	1.47	5.82	1.04	.
Benin	1.06	0.37	1.11	0.48	5.02
Bhutan	0.73	.	2.92	0.83	.
Bolivia	3.37	1.04	3.18	0.97	38.26
Bosnia and Herzegovina	11.88	0.76	5.16	.	.
Botswana	4.96	.	8.64	1.06	4.18
Brazil	5.81	0.35	7.15	1.10	20.13
Brunei Darussalam	0.13	.	44.75	1.05	13.67
Bulgaria	6.35	0.21	7.3	0.98	39.89
Burkina Faso	4.55	.	0.89	0.66	1.35
Burundi	9.4	0.45	0.31	.	1.81
C_te d'Ivoire	2.12	.	1.45	0.55	.
Cambodia	1.39	1.58	0.99	0.60	2.53
Cameroon	3.68	.	1.68	.	4.91
Canada	7.7	0.89	29.99	1.00	60.21
Cape Verde	4.32	0.69	2.08	1.05	3.57
Central African Republic	1.6	0.5	0.66	.	.
Chad	0.22	.	0.89	0.33	.
Chile	6.5	0.4	9.62	1.02	41.01
China	5.12	0.6	2.85	.	12.71
Colombia	5.7	0.5	4.79	1.11	24.02
Comoros	0.09	1.81	1.04	0.84	.
Congo	2.22	0.58	2.07	0.73	3.72
Cook Islands	0.42	.	.	.	.
Costa Rica	5.89	1.08	6.97	1.08	18.97
Croatia	12.83	0.53	10.43	1.02	35.82
Cuba	2.66	.	.	0.99	27.80
Cyprus	11.73	.	21.19	1.02	25.10
Czech Republic	12.81	0.22	15.56	1.03	34.97

Democratic People's Republic of Korea	3.22	.	.	.	.
Democratic Republic of the Congo	1.94	.	0.21	0.58	.
Denmark	11.7	1.01	29.31	1.05	63.45
Djibouti	1.81	.	1.67	0.62	1.01
Dominica	8.37	.	5.52	1.06	0.00
Dominican Republic	6.6	.	4.37	1.21	.
Ecuador	1.9	0.33	5.15	1.01	.
Egypt	0.1	0.65	4.02	0.93	.
El Salvador	3.67	.	4.77	1.01	17.49
Equatorial Guinea	1.45	0.67	9.65	0.57	.
Eritrea	1.06	0.48	0.66	0.64	1.23
Estonia	7.49	0.56	11.26	1.02	62.04
Ethiopia	0.95	0.52	0.48	0.62	1.56
Fiji	2.03	.	3.78	1.08	.
Finland	9.2	1.85	26.19	1.12	84.84
France	12.67	0.66	27.48	1.01	53.32
Gabon	8.7	0.56	11.33	.	.
gambia the	1.87	0.47	0.87	0.72	.
Georgia	1.57	0.28	2.48	0.99	40.86
Germany	12.26	0.79	27.24	0.99	.
Ghana	1.68	0.39	0.95	0.85	3.26
Greece	9.13	.	23.93	.	66.44
Grenada	6.13	.	6.84	1.05	0.00
Guatemala	2.2	1.37	4.46	0.89	9.51
Guinea	0.14	0.51	0.99	0.42	.
Guinea-Bissau	2.51	0.31	0.42	.	.
Guyana	3.99	1.34	2.81	1.03	.
Haiti	7.66	.	1.15	.	.
Honduras	2.93	0.87	2.77	.	17.26
Hungary	13.29	0.41	12.98	1.01	44.80
Iceland	6.5	2.27	28.46	1.06	54.11
India	0.3	0.68	1.66	0.75	10.41
Indonesia	0.1	0.8	2.58	0.99	15.03
iran	0	4.16	7.54	0.95	19.35
Iraq	0.18	.	.	0.60	12.61
Ireland	13.72	2.07	26.73	1.09	53.57
Israel	2.35	1.05	18.96	0.99	57.17
Italy	8.6	1.64	25.75	0.96	55.24
Jamaica	2.08	0.93	5.94	1.03	19.14
Japan	7.6	2.02	26.87	1.01	50.53
Jordan	0.18	1.03	3.61	1.02	32.98
Kazakhstan	3.71	0.97	5.95	0.99	38.83
Kenya	1.66	.	1.19	0.96	2.82
Kiribati	0.65	.	6.57	1.17	0.00
Kuwait	0.01	.	36.38	1.05	21.75
Kyrgyzstan	2.99	0.22	1.39	1.00	42.92
Lao People's Democratic Republic	6.91	0.51	1.4	0.73	4.27
Latvia	9.22	0.56	9.35	1.01	67.34
Lebanon	3.45	.	7.86	1.09	41.22

Lesotho	2.27	.	1.39	1.28	2.31
Liberia	3.8	.	0.33	.	.
libya	0.01	.	.	1.06	54.19
Lithuania	9.41	0.42	9.57	0.99	61.67
Luxembourg	14.69	0.89	52.49	1.06	11.60
Madagascar	1.14	.	0.68	.	2.02
Malawi	1.38	0.32	0.55	0.78	0.38
Malaysia	1.06	1.31	8.96	1.09	28.04
Maldives	.	.	3.16	1.15	0.00
Mali	0.57	.	0.81	.	2.31
Malta	6.06	0.95	18.82	0.99	24.30
Mauritania	0.02	.	1.61	0.80	3.13
Mauritius	3.1	0.51	8.37	1.00	11.53
Mexico	4.6	0.81	9.8	1.04	21.74
Micronesia (Federated States of)	1.79	0.69	.	.	.
Mongolia	2.86	0.45	1.97	1.20	33.99
Morocco	0.45	.	2.9	0.81	10.29
Mozambique	1.45	.	0.52	0.66	.
Myanmar	0.33	.	.	.	.
Namibia	3.3	0.46	3.87	1.12	5.86
Nauru	1.04	.	.	.	.
Nepal	0.17	0.69	0.84	0.74	4.98
Netherlands	9.82	0.59	31.3	0.97	55.72
New Zealand	9.82	1.22	20.56	1.11	69.15
Nicaragua	2.6	0.7	2.14	1.17	17.80
Niger	0.05	0.58	0.55	0.60	.
Nigeria	10.43	0.63	1.05	0.75	.
Niue	6.02	.	.	.	.
Norway	5.89	2.53	41.67	1.02	73.63
Oman	0.32	.	16.34	0.98	14.17
Pakistan	0.01	.	1.8	.	2.54
Panama	5.75	0.6	6.73	1.07	42.67
Papua New Guinea	1.84	.	1.48	.	.
Paraguay	3.75	0.28	3.39	1.02	25.96
Peru	1.45	1.06	5.17	0.93	31.95
Philippines	3.57	0.46	2.64	1.10	30.39
Poland	8.02	0.5	10.91	0.97	58.39
Portugal	11.67	0.52	18.07	.	53.41
Qatar	3.51	.	.	1.09	18.08
republic of korea	7.84	1.5	17.74	0.99	86.83
Republic of Moldova	12.91	0.33	1.69	1.03	.
Romania	10.28	0.3	7.16	1.02	31.79
Russian Federation	10.29	0.47	8.65	.	.
Rwanda	8.21	.	0.6	.	1.93
Saint Kitts and Nevis	6.72	.	10.09	0.98	0.00
Saint Lucia	9.04	.	7.19	1.32	.
Saint Vincent and the Grenadines	7.24	.	5.49	1.11	0.00
Sao Tome and Principe	6.85	.	.	0.85	0.00
Saudi Arabia	0	.	17.45	.	22.30

Senegal	0.48	.	1.27	0.67	.
Seychelles	3.6	2.62	12.75	1.00	0.00
Sierra Leone	6.42	.	0.47	.	2.12
Singapore	2.18	.	32.75	.	.
slovakia	10.78	0.47	12.39	1.01	32.33
Slovenia	7.11	0.64	18.6	1.00	66.70
Solomon Islands	0.61	.	1.38	0.82	0.00
Somalia	0	.	.	.	.
South Africa	6.92	0.38	6.97	1.08	14.59
Spain	11.21	0.67	23.59	1.06	62.22
Sri Lanka	0.3	0.37	2.72	1.06	.
Sudan	0.34	.	1.26	0.94	.
Suriname	.	0.77	5.43	1.38	12.43
Swaziland	5.57	.	3.98	1.02	4.44
Sweden	6.9	1.29	27.36	1.21	75.56
Switzerland	10.86	1.06	33.02	0.94	40.56
syria	0.48	.	3.42	0.91	.
Tajikistan	0.47	.	1.04	0.82	13.97
Thailand	5.77	0.64	5.51	1.01	40.98
TFYR Macedonia	3.61	0.8	6.12	0.97	26.95
Togo	0.97	0.54	0.69	0.48	.
Tonga	0.82	.	4.65	1.12	5.43
Trinidad and Tobago	4.79	1.05	10.12	1.11	8.36
Tunisia	1.1	.	4.95	1.05	22.81
Turkey	1.39	.	5.96	0.76	24.37
Turkmenistan	1.09	1.92	.	.	.
Uganda	.	0.66	0.72	0.81	3.02
Ukraine	4.91	0.28	3.94	1.00	56.86
United Arab Emirates	0.05	.	26.75	1.05	22.95
United Kingdom	11.78	2.61	27.79	1.01	62.88
United Republic of Tanzania	5.84	0.67	0.76	.	0.81
united states of america	8.49	0.74	36.34	0.99	80.46
Uruguay	7.76	0.63	6.95	1.13	.
Uzbekistan	1.46	.	1.58	0.97	13.80
Vanuatu	0.77	.	2.86	0.94	4.96
Venezuela	7.02	0.38	7.75	1.16	37.84
vietnam	0.87	0.46	1.62	.	.
Yemen	0.07	.	1.8	.	.
Zambia	2.63	0.7	0.94	0.83	.
Zimbabwe	4.35	.	.	0.88	4.06

Table 1, Regression 5 (all) continued:

country_name	median age	muslim majority?	unemployment rate	annual hoursworked	paid holidays
Afghanistan	16.41	1	.	.	.
Albania	26.93	1	.	.	.
Algeria	21.79	1	.	.	.
Angola	16.37	0	.	.	.

Antigua and Barbuda	.	0	.	.	.
Argentina	28.14	0	21.9	.	.
Armenia	30.33	0	.	.	.
Australia	35.40	0	12.8	1735.5	31
Austria	38.22	0	4.7	1652.2	38
Azerbaijan	25.56	1	.	.	.
Bahamas	26.35	0	.	.	.
Bahrain	27.25	1	.	.	.
Bangladesh	20.77	1	11	.	.
Barbados	33.27	0	17.6	.	.
Belarus	36.26	0	.	.	.
Belgium	39.08	0	12.9	1580	30
Belize	19.23	0	.	.	.
Benin	17.53	0	.	.	.
Bhutan	19.23	0	.	.	.
Bolivia	20.09	0	7	.	.
Bosnia and Herzegovina	35.10	0	.	.	.
Botswana	19.95	0	13.2	.	.
Brazil	25.31	0	.	.	41
Brunei Darussalam	25.11	1	.	.	.
Bulgaria	39.66	0	39.8	.	32
Burkina Faso	16.43	1	.	.	.
Burundi	16.59	0	.	.	.
C_te d'Ivoire	18.94	0	.	.	.
Cambodia	18.26	0	.	.	.
Cameroon	18.16	0	.	.	.
Canada	36.86	0	13.8	1744.4	20
Cape Verde	17.78	0	.	.	.
Central African Republic	18.80	0	.	.	.
Chad	16.86	1	.	.	.
Chile	28.76	0	17.6	.	.
China	29.63	0	.	.	.
Colombia	23.83	0	31.9	.	.
Comoros	19.06	1	.	.	.
Congo	18.34	0	.	.	.
Cook Islands	.	0	.	.	.
Costa Rica	24.53	0	9.1	.	.
Croatia	39.07	0	.	.	.
Cuba	34.21	0	.	.	.
Cyprus	33.53	0	4.5	.	36
Czech Republic	37.58	0	16.7	1980.1	31
Democratic People's Republic of Korea	30.19	0	.	.	.
Democratic Republic of the Congo	15.91	0	.	.	.
Denmark	38.41	0	6.5	1578.8	34
Djibouti	19.04	1	.	.	.
Dominica	.	0	.	.	.
Dominican Republic	22.63	0	16.2	.	.
Ecuador	22.68	0	.	.	.
Egypt	20.92	1	.	.	37

El Salvador	21.64	0	.	.	.
Equatorial Guinea	18.46	0	.	.	.
Eritrea	17.20	0	.	.	.
Estonia	37.85	0	22.1	.	38
Ethiopia	17.03	0	.	.	.
Fiji	22.62	0	.	.	.
Finland	39.34	0	21.2	1727.79	40
France	37.70	0	18.4	1537.171913	40
Gabon	19.32	0	.	.	.
gambia the	18.63	1	.	.	.
Georgia	34.36	0	21.6	.	.
Germany	39.96	0	9.2	1445.4	34
Ghana	19.01	0	.	.	.
Greece	38.17	0	22.1	2106.23222	37
Grenada	21.86	0	.	.	.
Guatemala	17.65	0	.	.	.
Guinea	17.79	1	.	.	.
Guinea-Bissau	19.23	0	.	.	.
Guyana	24.03	0	.	.	.
Haiti	19.13	0	.	.	.
Honduras	18.37	0	.	.	.
Hungary	38.49	0	13.8	2026.56	33
Iceland	32.78	0	5.7	1812	.
India	22.60	0	10.1	.	31
Indonesia	24.80	1	.	.	25
iran	22.01	1	.	.	.
Iraq	18.28	1	.	.	.
Ireland	32.48	0	6.1	1698	29
Israel	27.94	0	17.1	.	40
Italy	40.27	0	25.4	1830.97	31
Jamaica	24.33	0	23.8	.	.
Japan	41.38	0	10.4	1798	35
Jordan	19.73	1	.	.	.
Kazakhstan	27.73	1	.	.	.
Kenya	17.44	0	.	.	.
Kiribati	.	0	.	.	.
Kuwait	28.90	1	.	.	.
Kyrgyzstan	22.47	1	.	.	.
Lao People's Democratic Republic	18.24	0	.	.	.
Latvia	37.97	0	22.3	.	31
Lebanon	25.71	1	.	.	33
Lesotho	18.24	0	.	.	.
Liberia	17.70	0	.	.	.
libya	22.13	1	.	.	.
Lithuania	35.93	0	.	.	41
Luxembourg	37.34	0	5.7	1635	35
Madagascar	17.48	0	.	.	.
Malawi	16.96	0	.	.	.
Malaysia	23.58	1	8.3	.	28

Maldives	18.95	1	4	.	.
Mali	16.99	1	.	.	.
Malta	36.44	0	.	.	38
Mauritania	18.55	1	.	.	.
Mauritius	28.70	0	.	.	.
Mexico	23.38	0	4.2	1888.1	.
Micronesia (Federated States of)	18.92	0	.	.	.
Mongolia	21.93	0	22.7	.	.
Morocco	22.52	1	.	.	40
Mozambique	18.00	0	.	.	.
Myanmar	24.57	0	.	.	.
Namibia	19.13	0	41.9	.	.
Nauru	.	0	.	.	.
Nepal	19.23	0	.	.	.
Netherlands	37.49	0	4.9	1348	28
New Zealand	34.37	0	14.2	1816.9	31
Nicaragua	18.83	0	7	.	.
Niger	15.70	1	.	.	.
Nigeria	17.79	1	.	.	.
Niue	.	0	.	.	.
Norway	36.82	0	9.5	1414.1	35
Oman	21.37	1	.	.	.
Pakistan	19.02	1	11.1	.	28
Panama	24.82	0	24.7	.	.
Papua New Guinea	19.20	0	.	.	.
Paraguay	20.41	0	11.7	.	.
Peru	22.90	0	13.7	.	.
Philippines	20.85	0	19.8	.	19
Poland	35.32	0	33.3	1979	36
Portugal	37.83	0	6.2	1767	34
Qatar	30.39	1	.	.	.
republic of korea	32.05	0	.	.	30
Republic of Moldova	32.25	0	.	.	.
Romania	34.75	0	19.6	.	28
Russian Federation	36.50	0	.	.	40
Rwanda	16.64	0	.	.	.
Saint Kitts and Nevis	.	0	.	.	.
Saint Lucia	24.26	0	32.2	.	.
Saint Vincent and the Grenadines	24.18	0	.	.	.
Sao Tome and Principe	17.95	0	.	.	.
Saudi Arabia	21.31	1	.	.	.
Senegal	16.99	1	.	.	.
Seychelles	.	0	.	.	.
Sierra Leone	18.67	1	.	.	.
Singapore	34.55	0	.	.	26
slovakia	33.91	0	39.7	1733.4	35
Slovenia	38.02	0	.	.	36
Solomon Islands	18.58	0	.	.	.
Somalia	18.01	1	.	.	.

South Africa	22.95	0	42.1	.	33
Spain	37.61	0	19.4	1721	36
Sri Lanka	27.66	0	19.9	.	.
Sudan	18.65	0	.	.	.
Suriname	25.70	0	.	.	.
Swaziland	17.25	0	.	.	.
Sweden	39.37	0	12.4	1595	36
Switzerland	38.78	0	5.7	1630.4	.
syria	18.68	1	.	.	.
Tajikistan	18.45	1	.	.	.
Thailand	29.98	0	7	.	19
TFYR Macedonia	32.46	0	58.1	.	.
Togo	18.16	0	.	.	.
Tonga	19.71	0	.	.	.
Trinidad and Tobago	26.93	0	20.3	.	.
Tunisia	24.62	1	.	.	.
Turkey	24.53	1	13.7	1943	.
Turkmenistan	21.63	1	.	.	.
Uganda	15.26	0	.	.	.
Ukraine	37.69	0	.	.	.
United Arab Emirates	28.57	1	.	.	39
United Kingdom	37.71	0	13.2	1696	28
United Republic of Tanzania	17.41	0	.	.	.
united states of america	35.10	0	9.7	1810	25
Uruguay	31.58	0	26.6	.	.
Uzbekistan	20.94	1	.	.	.
Vanuatu	18.69	0	.	.	.
Venezuela	23.28	0	22.3	.	.
vietnam	23.20	0	5	.	22
Yemen	15.76	1	.	.	.
Zambia	17.21	0	.	.	.
Zimbabwe	18.05	0	.	.	.

Table 2, Regression 6 (all):

country_name	consumption, 1995	consumption, 2000	median age, 1995	median age, 2000
Afghanistan	.	0	16.58	16.41
Albania	2.79	1.93	25.80	26.93
Algeria	0.33	0.16	19.55	21.79
Angola	2.1	2.15	16.10	16.37
Antigua and Barbuda	.	5.81	.	.
Argentina	9.26	8.78	27.70	28.14
Armenia	2.52	1.55	29.22	30.33
Australia	9.69	9.52	33.73	35.40
Austria	11.89	11.06	36.43	38.22
Azerbaijan	1.21	6.73	24.13	25.56
Bahamas	10.93	8.71	24.72	26.35

Bahrain	4.27	5.61	26.63	27.25
Bangladesh	0	0.01	19.27	20.77
Barbados	.	.	30.70	33.27
Belarus	8.81	7.13	34.64	36.26
Belgium	11.1	10.3	37.60	39.08
Belize	4.91	6.81	18.48	19.23
Benin	1.16	1.42	17.49	17.53
Bhutan	1.91	2.25	18.01	19.23
Bolivia	2.99	3.65	19.59	20.09
Bosnia and Herzegovina	8.52	9.64	32.23	35.10
Botswana	5.61	6.27	18.57	19.95
Brazil	5.86	5.91	23.94	25.31
Brunei Darussalam	0.69	0.38	24.16	25.11
Bulgaria	9.74	7.47	38.25	39.66
Burkina Faso	4.12	3.62	16.24	16.43
Burundi	7.82	10.71	16.68	16.59
C_te d'Ivoire	1.58	1.61	18.32	18.94
Cambodia	0.34	1.53	17.26	18.26
Cameroon	5.04	3.67	17.53	18.16
Canada	7.3	7.6	34.77	36.86
Cape Verde	3.93	3.47	16.71	17.78
Central African Republic	2.55	1.82	18.67	18.80
Chad	0.18	0.2	16.87	16.86
Chile	8.07	7.32	27.11	28.76
China	4.96	5.23	27.22	29.63
Colombia	6.91	6.05	22.61	23.83
Comoros	0.1	0.09	17.81	19.06
Congo	2.13	2.17	18.17	18.34
Cook Islands	.	2.34	.	.
Costa Rica	5.14	5.47	23.55	24.53
Croatia	12	11.78	37.44	39.07
Cuba	3.22	2.81	30.65	34.21
Cyprus	9.57	9.67	31.91	33.53
Czech Republic	12.53	13.16	36.16	37.58
Democratic People's Republic of Korea	3.87	3.66	28.07	30.19
Democratic Republic of the Congo	1.57	2.05	15.97	15.91
Denmark	12.11	11.66	37.71	38.41
Djibouti	0.48	1.6	18.19	19.04
Dominica	.	8.55	.	.
Dominican Republic	5.16	7.44	21.46	22.63
Ecuador	1.63	1.16	21.45	22.68
Egypt	0.48	0.09	19.63	20.92
El Salvador	2.46	3.58	20.59	21.64
Equatorial Guinea	2.85	0.43	20.22	18.46
Eritrea	1.96	1.05	16.15	17.20
Estonia	4.04	6.85	36.34	37.85
Ethiopia	0.72	0.9	17.09	17.03
Fiji	1.68	2.09	22.00	22.62
Finland	8.31	8.59	37.80	39.34

France	14.16	12.93	36.35	37.70
Gabon	7.2	8.48	19.04	19.32
gambia the	1.39	2.16	18.64	18.63
Georgia	6.8	1.83	32.56	34.36
Germany	13.01	12.44	38.40	39.96
Ghana	2.01	1.58	18.29	19.01
Greece	10.46	9.41	37.08	38.17
Grenada	.	10.92	20.89	21.86
Guatemala	1.88	1.61	17.30	17.65
Guinea	0.47	0.17	17.62	17.79
Guinea-Bissau	2.96	3.07	19.27	19.23
Guyana	3.67	3.91	22.41	24.03
Haiti	5.02	5.07	18.55	19.13
Honduras	2.24	2.54	17.57	18.37
Hungary	12.21	13.12	37.52	38.49
Iceland	4.8	6.13	31.46	32.78
India	0.31	0.3	21.72	22.60
Indonesia	0.11	0.11	23.19	24.80
iran	0	0	19.11	22.01
Iraq	0.55	0.21	17.62	18.28
Ireland	11.88	13.68	30.90	32.48
Israel	1.47	2.06	27.04	27.94
Italy	9.62	8.96	38.68	40.27
Jamaica	3.69	2.46	23.19	24.33
Japan	7.87	7.63	39.61	41.38
Jordan	0.14	0.17	18.79	19.73
Kazakhstan	4.72	3.42	27.05	27.73
Kenya	2	1.48	16.57	17.44
Kiribati	.	0.99	.	.
Kuwait	0	0	26.78	28.90
Kyrgyzstan	3.2	2.15	21.46	22.47
Lao People's Democratic Republic	9.21	6.75	18.04	18.24
Latvia	9.21	9.37	36.16	37.97
Lebanon	8.2	3.32	24.28	25.71
Lesotho	1.76	2.18	17.44	18.24
Liberia	6.42	3.54	17.44	17.70
libya	0	0.01	19.91	22.13
Lithuania	11.76	7.74	34.03	35.93
Luxembourg	14.32	15.41	36.67	37.34
Madagascar	1.18	1.4	17.53	17.48
Malawi	1.5	1.29	17.24	16.96
Malaysia	0.94	1.08	22.35	23.58
Maldives	.	.	17.04	18.95
Mali	0.47	0.44	16.99	16.99
Malta	6.88	6.5	35.04	36.44
Mauritania	0.01	0.03	17.89	18.55
Mauritius	3.78	3.65	26.76	28.70
Mexico	5.14	4.81	21.52	23.38
Micronesia (Federated States of)	0.7	.	17.83	18.92

Mongolia	1.53	2.75	20.04	21.93
Morocco	0.32	0.46	20.88	22.52
Mozambique	0.73	0.92	17.74	18.00
Myanmar	0.21	0.28	22.79	24.57
Namibia	0.09	2.41	18.33	19.13
Nauru	.	4.93	.	.
Nepal	0.07	0.08	18.79	19.23
Netherlands	9.8	10.06	35.98	37.49
New Zealand	10.38	8.77	32.57	34.37
Nicaragua	2.34	2.72	17.63	18.83
Niger	0.06	0.05	15.56	15.70
Nigeria	6.22	11.2	17.35	17.79
Niue	.	9	.	.
Norway	4.84	6.25	36.09	36.82
Oman	1.46	0.29	20.17	21.37
Pakistan	0.04	0.02	18.28	19.02
Panama	5.05	6.09	23.43	24.82
Papua New Guinea	1.01	2.05	19.09	19.20
Paraguay	3.16	3.78	19.69	20.41
Peru	2.79	1.82	21.60	22.90
Philippines	3.83	3.83	19.91	20.85
Poland	8.14	8.27	33.79	35.32
Portugal	14.71	13.03	36.05	37.83
Qatar	0.84	2.21	29.03	30.39
republic of korea	7.75	7.3	29.51	32.05
Republic of Moldova	15.81	13.52	30.79	32.25
Romania	11.32	9.06	34.02	34.75
Russian Federation	11.17	10.46	34.99	36.50
Rwanda	8.21	7.08	15.31	16.64
Saint Kitts and Nevis	.	7.23	.	.
Saint Lucia	12.12	12.06	23.07	24.26
Saint Vincent and the Grenadines	.	6.39	22.30	24.18
Sao Tome and Principe	.	4.56	17.10	17.95
Saudi Arabia	0.07	0	19.40	21.31
Senegal	0.39	0.42	16.61	16.99
Seychelles	.	4.01	.	.
Sierra Leone	4.16	6.22	18.67	18.67
Singapore	2	2.08	31.82	34.55
slovakia	10.34	11.06	32.44	33.91
Slovenia	13.22	11.75	36.06	38.02
Solomon Islands	0.27	0.31	17.79	18.58
Somalia	0	0	17.98	18.01
South Africa	7.96	7.35	21.73	22.95
Spain	11.38	11.48	35.60	37.61
Sri Lanka	0.17	0.24	25.78	27.66
Sudan	0.26	0.27	18.19	18.65
Suriname	.	.	24.50	25.70
Swaziland	5.77	9.97	16.12	17.25
Sweden	6.42	6.2	38.46	39.37

Switzerland	11.76	11.12	37.42	38.78
syria	0.64	0.67	17.10	18.68
Tajikistan	1.79	0.29	18.16	18.45
Thailand	5.04	5.15	26.86	29.98
TFYR Macedonia	.	3.37	30.91	32.46
Togo	1.58	1.18	17.44	18.16
Tonga	.	0.71	19.67	19.71
Trinidad and Tobago	4.27	3.47	25.00	26.93
Tunisia	1.06	1.13	22.80	24.62
Turkey	1.48	1.41	22.91	24.53
Turkmenistan	2.08	1.51	20.19	21.63
Uganda	.	.	15.49	15.26
Ukraine	3.44	4.48	36.22	37.69
United Arab Emirates	3.32	0	27.42	28.57
United Kingdom	9.55	10.36	36.55	37.71
United Republic of Tanzania	6.02	5.25	17.18	17.41
united states of america	8.58	8.65	33.95	35.10
Uruguay	8.23	7.93	31.13	31.58
Uzbekistan	1.51	1.59	19.78	20.94
Vanuatu	1.75	0.88	18.43	18.69
Venezuela	7.91	7.28	22.07	23.28
vietnam	0.31	0.74	21.09	23.20
Yemen	0.16	0.08	15.13	15.76
Zambia	3.06	2.69	17.26	17.21
Zimbabwe	3.61	4.76	17.41	18.05

Table 2, Regression 6 (all) continued:

country_name	female-male ratio, 1995	female-male ratio, 2000	gnpPC, 1995	gnpPC, 2000
Afghanistan	92.9	93	.	.
Albania	98.3	101	2700	3920
Algeria	98.3	98.2	3670	4330
Angola	103	103	1310	1910
Antigua and Barbuda	.	.	9060	10800
Argentina	103.9	104.3	7700	8890
Armenia	110.7	112.6	1390	2090
Australia	100.9	101.5	21260	26660
Austria	106.2	105.1	22800	28350
Azerbaijan	104.2	104.9	1540	2130
Bahamas	102.8	103.7	.	.
Bahrain	71.6	73.7	20450	23930
Bangladesh	94.7	95	650	830
Barbados	107.5	107.1	.	.
Belarus	112.9	113.5	3420	5130
Belgium	104.5	104.4	22160	27330
Belize	97.2	97.6	4510	5450

Benin	100.1	99.8	840	1040
Bhutan	96.6	97.2	1670	2290
Bolivia	101.3	101	2620	3050
Bosnia and Herzegovina	102.2	104.6	1140	4760
Botswana	102.8	102.5	5880	8190
Brazil	101.8	102.3	6240	6840
Brunei Darussalam	.	.	41090	42170
Bulgaria	104.2	105.2	5470	5980
Burkina Faso	102	101.2	620	810
Burundi	105.5	106.3	310	310
C_te d'Ivoire	94.6	95.7	1280	1460
Cambodia	107.8	106.3	640	860
Cameroon	101	100.8	1280	1560
Canada	102	101.9	21840	27960
Cape Verde	111.4	109.8	1470	1920
Central African Republic	106.1	105.8	600	650
Chad	102	101.6	750	770
Chile	102.1	102.1	7230	8980
China	93.6	93.6	1490	2340
Colombia	102.4	102.8	4480	4620
Comoros	99.7	99.5	930	970
Congo	102.5	102.3	1430	1860
Cook Islands	.	.	.	.
Costa Rica	96.6	96.7	5590	6420
Croatia	107.5	107.7	6870	8940
Cuba	99.1	100	.	.
Cyprus	100.3	103.1	16130	18950
Czech Republic	105.7	105.5	12630	14540
Democratic People's Republic of Korea	103.7	103.5	.	.
Democratic Republic of the Congo	102.7	102.5	250	210
Denmark	102.6	102.3	22890	27730
Djibouti	100.4	100.3	1780	1610
Dominica	.	.	4840	5420
Dominican Republic	98.4	98.8	2730	4010
Ecuador	99	99.2	4410	4440
Egypt	99	99.3	2900	3740
El Salvador	104.3	103.9	4010	4550
Equatorial Guinea	103	102.7	2040	6420
Eritrea	105	104.5	650	630
Estonia	115.8	116.8	6470	9300
Ethiopia	101.3	101.3	380	450
Fiji	96.8	96.9	2950	3540
Finland	105.4	104.9	17260	23920
France	105.7	105.5	21160	26220
Gabon	101.6	101.3	10820	10390
gambia the	99.9	99.8	810	880
Georgia	110.5	110.9	1290	2160
Germany	105.5	105	21870	25990
Ghana	98.1	97.8	740	870

Greece	102.5	102.4	17470	21400
Grenada	102.4	102.5	5150	7160
Guatemala	101.1	103.6	3670	4310
Guinea	98.5	98.4	760	900
Guinea-Bissau	102.9	102.6	470	450
Guyana	105.8	106.2	2070	2630
Haiti	102.4	102.1	1050	1170
Honduras	99.9	100.7	2230	2640
Hungary	109	109.7	8680	11430
Iceland	99.5	99.7	19960	26260
India	92.4	92.6	1130	1500
Indonesia	99.6	99.9	2230	2260
iran	96.3	96.8	5550	6820
Iraq	97.4	97.4	.	.
Ireland	101.4	101.2	15720	24540
Israel	102.7	102.5	15270	18890
Italy	106.1	106.1	20230	24290
Jamaica	102.9	102.7	5540	5760
Japan	103.9	104.3	22580	25690
Jordan	91.3	93.5	2780	3280
Kazakhstan	106.9	108.5	3640	4500
Kenya	100.9	101	1060	1150
Kiribati	.	.	4300	5640
Kuwait	66.3	64.5	38840	38070
Kyrgyzstan	103.2	102.9	980	1250
Lao People's Democratic Republic	100	99.9	980	1240
Latvia	116.7	117.4	5080	7650
Lebanon	103.1	104.1	6740	7520
Lesotho	114.4	114	1300	1330
Liberia	100.2	100.3	0	270
libya	90.7	91.8	.	.
Lithuania	112.2	113.7	6010	7800
Luxembourg	103.8	103.1	37610	48370
Madagascar	101.1	101.1	640	750
Malawi	102.6	102.1	530	610
Malaysia	96.8	96.6	7240	8440
Maldives	94.8	94.8	1960	2880
Mali	105.1	105.5	610	750
Malta	101.9	101.8	13900	17590
Mauritania	99.4	98.6	1280	1430
Mauritius	100.4	101	5640	7510
Mexico	102.3	102.6	7040	9470
Micronesia (Federated States of)	95.6	97.6	.	.
Mongolia	100	100.1	1500	1790
Morocco	101.2	102.2	2070	2560
Mozambique	109.6	108.1	300	420
Myanmar	100.9	101.2	340	510
Namibia	104	103.6	3190	3510
Nauru	.	.	.	.

Nepal	101	101.4	650	800
Netherlands	102.2	102.1	23360	30230
New Zealand	102.9	103.7	15710	18420
Nicaragua	100.2	100.1	1490	2030
Niger	98.6	97.4	480	510
Nigeria	101.1	100.7	970	1020
Niue	.	.	.	.
Norway	102.2	101.9	30410	38390
Oman	69.6	72.6	12600	14460
Pakistan	94.1	94.3	1530	1690
Panama	97.9	98.1	5150	6310
Papua New Guinea	94.8	96	1560	1560
Paraguay	97.8	97.6	3460	3310
Peru	99	99.3	4140	4830
Philippines	98.6	98.6	2030	2490
Poland	105.5	106.2	7110	10150
Portugal	107.5	107.2	13430	17140
Qatar	51.8	54	.	.
republic of korea	99.2	99.5	11980	15440
Republic of Moldova	108.7	108.9	1250	1310
Romania	103.9	104.7	5860	6030
Russian Federation	113	113.8	6360	7440
Rwanda	108.3	108.6	450	530
Saint Kitts and Nevis	.	.	8470	10110
Saint Lucia	103.5	103.3	6030	7040
Saint Vincent and the Grenadines	.	.	3750	5040
Sao Tome and Principe	101.6	101.7	.	.
Saudi Arabia	79.1	80.6	16070	17450
Senegal	99.2	100	1030	1220
Seychelles	.	.	9980	13420
Sierra Leone	103.1	103.1	390	330
Singapore	98.6	98.6	25900	32350
slovakia	105.3	105.8	8690	11060
Slovenia	105.3	105.1	12710	16980
Solomon Islands	93.1	93.2	1880	1600
Somalia	102.4	102	.	.
South Africa	103.1	103.5	5860	6460
Spain	104.2	104.1	16960	21970
Sri Lanka	99	100.5	1930	2490
Sudan	98.9	98.8	820	1040
Suriname	99.6	99.5	4510	5050
Swaziland	108.6	107.9	3660	3900
Sweden	102.4	102.2	19810	25500
Switzerland	104.6	104.5	26890	33180
syria	98.2	98.1	3120	3150
Tajikistan	99.9	99.5	840	820
Thailand	102.2	103.5	4750	5000
TFYR Macedonia	.	.	4990	6110
Togo	102.3	102.3	590	670

Tonga	97.4	96.7	3580	4130
Trinidad and Tobago	102.4	102.9	6210	8480
Tunisia	98.1	98.3	3400	4540
Turkey	97.9	98.2	5010	6020
Turkmenistan	102.6	102.8	.	.
Uganda	100.9	100.6	520	660
Ukraine	115.5	115.9	3160	3170
United Arab Emirates	51.3	48.3	26310	26810
United Kingdom	105.7	105.3	19980	24870
United Republic of Tanzania	101.9	101.7	570	680
united states of america	103.6	103.5	27330	35190
Uruguay	106.2	106.5	6580	7750
Uzbekistan	101.6	101.2	1190	1430
Vanuatu	94.7	95.3	3010	3190
Venezuela	98.4	98.7	8040	8340
vietnam	100.4	100.2	980	1400
Yemen	97.1	97.4	1320	1730
Zambia	101.6	101.7	760	860
Zimbabwe	101.7	102.3	.	.