Minimum Unit Pricing in Ireland: A Quasi-Experimental Evaluation of Alcohol Prices, Consumption, and Drink-Driving Offences

Author: Daniel Heneck

Supervisor: Tom Paskhalis

University: Trinity College, Dublin

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Abstract

This paper presents the first empirical evaluation of Minimum Unit Pricing (MUP) in Ireland. Introduced in January 2022, MUP set a price floor of €0.10 per gram of alcohol with the primary aim of reducing alcohol consumption among harmful and hazardous drinkers within the country.

To assess the policy's impact, this paper utilises both single-group Interrupted Time Series (ITS) and Controlled Interrupted Time Series (CITS) regression techniques. Results from the single-group ITS analysis provide strong evidence to suggest that MUP was associated with a significant and immediate increase in off-trade alcohol prices, with weaker evidence of a corresponding increase in on-trade prices.

The analysis also finds no evidence that MUP was associated with a reduction in drink-driving offences, after accounting for variations in the number of drivers on the road during different phases of COVID-related lockdowns.

Most notably, the study finds that MUP was not associated with a reduction in either the level or trend of alcohol consumption in Ireland, using alcohol cleared for sale as a proxy, based on data from Q1 2018 to Q1 2024. This finding is robust across multiple specifications, using Northern Ireland as a control group in CITS analyses. To the best of the author's knowledge, this is the first study to directly compare alcohol consumption trends between Ireland and Northern Ireland.

While these findings do not support the effectiveness of MUP in reducing overall consumption in its first two years after implementation, future research should examine its effect across subgroups, particularly among the heaviest drinkers, in order to fully evaluate the policy's impact.

1. Introduction

Alcohol use is a significant global health concern, contributing to approximately 2.6 million deaths each year, and accounting for 4.7% of the global burden of disease (World Health Organisation, n.d.). As a result, its consumption is one of the leading risk factors for both premature death and disability worldwide. In light of this, the development of effective alcohol policy aimed at reducing consumption and alcohol-related harm remains a key priority for public health policymakers globally.

Ireland has historically exhibited high levels of alcohol consumption, with the country ranking ninth among OECD (Organisation for Economic Co-operation and Development) nations for per capita alcohol consumption and eighth in the world for monthly binge drinking[1] (O'Dwyer *et al*. 2021). In response to the high prevalence of alcohol consumption

[1] Binge drinking is classified as consuming more than six standard drinks (60 grams of ethanol) in one sitting.

and corresponding health-related harms within Ireland, the Department of Health introduced the Public Health (Alcohol) Act in 2018 (Government of Ireland, 2018).

A key provision of this Act was the announcement of a minimum unit price (MUP) of €0.10 per gram of alcohol, to be charged when the product leaves the tax warehouse (Government of Ireland, 2018). With one standard alcoholic drink in Ireland containing 10g of pure alcohol, this policy established a minimum retail price of €1 per standard drink[2]. The primary aim of MUP is to reduce the availability of cheap and higher-strength alcohol, with the expectation that the greatest reduction in consumption would occur among both low-income consumers, and those drinking at hazardous or harmful levels (Holmes, 2023).

On January 4th, 2022, four years after the Public Health (alcohol) Act was passed, MUP came into effect in Ireland. As of yet there has been no empirical research conducted on the direct effect of MUP in the country. As such, this paper seeks to update the existing literature by empirically assessing the impact of the MUP on alcohol consumption, prices and alcohol related harms within Ireland.

The analysis in this study takes two approaches. Firstly, descriptive statistics are used to assess differences in the trends of alcohol consumption (using the volume of alcohol cleared for sale as a proxy), alcohol related drink-driving offences, and on-trade versus off-trade alcohol prices from pre- to post-MUP implementation.

Secondly, the causal impact of the MUP is measured through use of Controlled (or Comparative) Interrupted Time Series (CITS) and single-group Interrupted Time Series (ITS) regression models. The Republic of Ireland serves as the treatment group, while Northern Ireland is used as the control group. Northern Ireland was selected due to its economic, geographic and social comparability to Ireland, and because MUP has not been implemented there, was deemed a suitable counterfactual for assessing the policy's effects.

The findings of this study indicate that while MUP was associated with a significant and immediate increase in off-trade alcohol prices, there is no evidence that it led a reduction in either drink-driving offences or overall alcohol consumption in Ireland. These results were consistent across multiple model specifications and robustness checks, including the use of both CITS and single-group ITS models.

[2] A standard drink in Ireland is equivalent to half a pint of beer (4.5% volume) or a 100ml glass of wine (12.5% volume) (Health Service Executive, n.d.)

The remainder of the paper is structured as follows: Section 2 provides the theoretical framework for MUP and synthesises the empirical literature on similar interventions in other countries. Section 3 provides a discussion about the data that were used for analysis in this paper and where the data were obtained from. Section 4 is a discussion of results found in this study, while Sections 5 and 6 and conclude the paper with a discussion on policy recommendations and limitations.

2. Literature Review

There is strong empirical evidence to suggest that policies which focus on increasing the price of alcohol, thereby reducing its affordability, are effective at reducing population-level alcohol consumption and related harms (Burton *et* al., 2017; Robinson *et al*., 2021). Despite this, only five countries have implemented minimum pricing policies on all alcoholic beverages thus far – namely Scotland, Wales, Armenia, Ukraine and Ireland (Sheffield Alcohol Research Group, n.d.). This section provides a synthesis of the key empirical literature on MUP implementation, specifically focussing on Scotland and Wales due to their relative similarity to the Irish context.

Theoretical Justification of MUP

The primary aim of MUP is to reduce alcohol consumption and alcohol related harms by setting a price floor based on the alcohol content of a product. The mechanism through which this policy operates is the increased price of alcohol, particularly affecting inexpensive, high-strength products. The formula commonly used to determine the minimum price is:

MUP (currency unit) × Strength (%) × Volume (litres)

which ensures that higher-strength alcoholic beverages are priced higher than their lower-strength counterparts (Welsh Government, n.d.). In practice, MUP is expected to raise the average price of alcohol sold through off-trade channels – such as supermarkets and off-licences – where low-cost, high-alcohol percentage products are more prevalent (Public Health Scotland, 2023).

Provided that more beverages were sold below the threshold before MUP implementation than there were beverages sold above the threshold, then average alcohol prices will increase if compliance is sufficiently high. However, if most products were already priced above the threshold, average prices could remain unchanged or even decrease (Public Health Scotland, 2023). Therefore, the overall impact of MUP on consumption and alcohol-related harms depends on the extent to which average prices actually increase. When average prices do rise significantly, consumption and associated harms are expected to decline. Conversely, if the average price changes are marginal (or non-existent) then the policy will have limited impact on alcohol consumption and related harms (Public Health Scotland, 2023).

Scotland

Consumption and Price Effects

MUP was implemented in Scotland in May 2018, setting a price floor of £0.50 (€0.59) [3] per unit of alcohol – making it the first country in the world to implement the policy (Doyle, 2023). In Scotland, one unit of alcohol is equivalent to 8g of pure alcohol (ethanol). Since its implementation, several empirical studies have assessed the impact of the policy on consumption and related harms/health outcomes within Scotland. The majority of these studies utilise a CITS design, using data from four to five years prior to implementation and between six months to three years post-implementation (Public Health Scotland, 2023).

O'Donnell *et al*. (2019) assessed the immediate impact of MUP on household consumption in Scotland using both single-group ITS and CITS analyses – using Northern England as the control group. Using weekly purchasing data from 2015 to eight months after the MUP implementation in 2018, O'Donnell *et al*. (2019) found that MUP in Scotland was associated with an immediate increase in the purchase price of alcohol by £0.64 (€0.75) per gram of alcohol as well as a decrease in weekly purchases of alcohol by 9.5g (a 7.7% decrease) per adult. Further analysis by alcohol type revealed that declines in household purchases were similar for beer, cider, and spirits, whereas no significant reductions were observed for wine or ready-to-drink (RTD) products from pre- to post-MUP (O'Donnell *et al*., 2019).

Building on this research, Anderson et al. (2021) extended the time frame to cover 2015 through 2018 and part of 2020. They similarly found that MUP was associated with a 7.6% increase in the price of alcohol and a 7.7% decrease in household alcohol purchases in Scotland, relative to Northern England. The consistency between these findings suggests that the effects of MUP on alcohol price and household purchasing behaviour were immediate and sustained over a longer period following implementation.

While household purchase surveys provide valuable insights, particularly into changes in alcohol price levels and purchasing patterns for home consumption, they have limitations as a

[3] This was increased to £0.65 (€0.76) per unit of alcohol on September 30th, 2024 – however the effect of this increase has not been assessed as of yet (Scottish Government, n.d.).

comprehensive measure of overall consumption. To more accurately assess country-level changes in alcohol consumption, analyses based on the volume of alcohol sold are typically considered more robust, as they better capture both on-trade and off-trade consumption.

To this end, Robinson *et al*. (2021) and Giles *et al*. (2023) provide further insight into the impact of MUP on consumption in Scotland using the total volume of alcohol sales for off-trade and on-trade locations. Notably, both studies find significantly smaller reductions in sales compared to the previously discussed household purchase studies, despite also using CITS analysis with Northern England as the control group. For example, Robinson *et al*. (2021) found that MUP was associated with a 3.5% reduction in alcohol consumption one year after its implementation in Scotland. Similarly, Giles *et al*. (2023) find a net reduction in the volume of pure alcohol sold of 3%, three years after implementation. Both findings are significantly lower than the household level analyses of consumption, thus highlighting the importance of distinguishing between measures of purchasing behaviour and overall consumption when evaluating the effectiveness of MUP.

It is important to note that, despite using CITS regressions, none of the above-mentioned studies control for macro-level covariates that may have influenced alcohol consumption in Scotland. For example, O'Donnell *et al*. (2019) control for time and country (as well as the interaction between time and country), while Anderson *et al*. (2021) and Robinson *et al*. (2021) control for household disposable income and individual disposable income respectively, as well as on-trade and off-trade sales. However, none of these studies account for country-level changes in GDP, inflation or unemployment – all three of which may reasonably affect alcohol consumption. The omission of these controls introduces the potential for omitted variable bias, which may result in overestimating the causal impact of MUP on consumption and prices.

While the difference in controls used between models is a source of potential bias in MUP analysis, it is important to note that the empirical results for Scotland all strongly suggest that MUP was associated with immediate and significant price increases and corresponding declines in consumption. Despite this, the magnitude of these effects remains subject to variation, with estimates of the average price increase for off-trade alcohol ranging from approximately 5% to 8.3% and reported decreases in consumption ranging from 3% to 7.7% following MUP implementation.

Alcohol Related Harms

Broadly, the empirical literature in Scotland provides strong evidence to suggest that MUP is associated with a reduction in deaths wholly attributable to alcohol consumption (Public Health Scotland, 2023). Using data from 2012 to 2020 on the number of deaths and hospitalisations in Scotland and England (the control group in the CITS) that were wholly attributable to alcohol, Wyper *et al*. (2023) find that MUP in Scotland was associated with a 13.4% reduction in deaths wholly attributable to alcohol consumption, relative to England. Hospitalisations that were wholly attributable to alcohol consumption also decreased by 4.1% in response to the MUP in Scotland, with the reductions primarily being driven by improvements in chronic conditions such as alcoholic liver disease (Wyper *et al*., 2023).

On the other hand, other studies found no evidence of an effect of MUP on a range of health-related outcomes. These include alcohol-related ambulance callouts (Manca *et al*., 2022; Manca *et al*., 2024), the volume of prescriptions for treatment of alcohol dependence (Manca *et al*., 2024), and the level of alcohol dependence in Scotland, relative to England (Public Health Scotland, 2023). In terms of traffic-related harms, Francesconi and James (2018) report that the MUP had no effect on road traffic accidents (RTAs) and drunk driving collisions, in the first eight months post- implementation, while Manca et al. (2022) found an increase in RTAs in the 20 months following MUP implementation.

Notably, all studies discussed thus far – including those on health, consumption and price outcomes – make use of single-group ITS and CITS models in their analyses, typically using England and/or Wales as control groups. Given its strong credibility in the literature as a robust measure of the causal impact of the MUP, this paper also makes use of ITS and CITS regression models, using Northern Ireland as the control group where data are available.

Wales

Similarly to Scotland, Wales also implemented a MUP of £0.50 (€0.59) per unit of alcohol. The policy came into effect two years after Scotland, in March 2020, and formed part of a broader initiative to reduce alcohol consumption, referred to as minimum alcohol pricing (MAP) (Welsh Government, n.d.). Wales, like Scotland, adopted the policy in response to persistently high levels of alcohol consumption and related harms, and introduced MAP with the aim of specifically targeting both hazardous and harmful drinkers (Welsh Government, 2017; Livingston *et al*., 2025).

Consumption and Price Effects

Mitchell *et al*. (2023) and Mitchell *et al*. (2025) are the two major quantitative studies measuring the impact of MUP (or MAP) in Wales. Both studies used single-group ITS and CITS analyses with England serving as the control group. However, they differ slightly in their outcome measures, data sources, and timeframes.

The initial report, Mitchell *et al*. (2023), used the volume of alcohol-containing drinks as the outcome variable. Using point-of-sale data from small retailers (March 2019-Februrary 2022) and household panel data tracking purchases from large supermarkets and smaller retailers (March 2015-February 2022), the study found no significant effect of MAP on average household spending on alcohol or the total volume of alcohol purchased. (Mitchell *et al*., 2023). Subgroup analysis indicated that cider was the only beverage for which volume declined significantly relative to England. Despite this, average prices per litre of alcohol increased across most beverage categories in Wales relative to England, which indicates that consumers were spending more on alcohol to maintain pre-existing consumption levels Mitchell *et al*., 2023).

In contrast to Mitchell *et* al., (2023), Mitchell *et* al., (2025) use the number of units of alcohol purchased per household as their measure of consumption. Using a longer time frame (March 2015-February 2023) of household panel shopping data, Mitchell *et al*. (2025) find a slightly larger impact of the MPA on alcohol purchases/consumption than the previous study. Alcohol purchases were found to be significantly lower in Wales relative to England post-MAP implementation. Unlike the earlier study, Mitchell et al. (2025) reported no evidence of variation in the effect of MPA on purchases across different alcohol categories.

Notably, both studies indicate that COVID played a significant part in results, with both papers highlighting that sales of alcohol increased significantly in Wales and England in March 2020, which coincided with the period immediately after MAP was introduced (one month before the COVID lockdowns were enacted). The use of CITS was deemed sufficient to disentangle the effects of MPA policy from the COVID restrictions – given the similarity of restrictions that were enacted in England in Wales. In light of this precedent, and given the relative similarity in COVID-19 restrictions between Ireland and Northern Ireland, the use of a CITS design in this study should be similarly well-suited to isolate the causal impact of MUP from pandemic-related effects on alcohol consumption.

It is also worth noting that a potential shortcoming of these reports is that neither study accounts for alcohol sales through on-trade channels. As such, the analysis presented in these reports may underestimate the overall impact of the MAP policy on pricing and consumption at the population level in Wales. In contrast, this paper examines the impact of MUP on overall alcohol sales across both on-trade and off-trade channels, thereby allowing for a more robust assessment of the policy's effects on alcohol consumption and pricing in Ireland.

Alcohol Related Harms

There has been little empirical research assessing the impact of MUP in Wales on alcohol related harms. Pre-implementation modelling studies projected that the policy would result in approximately 66 fewer alcohol-related deaths per year and a 3.6%–3.8% reduction in alcohol-related hospital admissions (Angus et al., 2016; Maharaj et al., 2023). However, recent data presented by Livingston et al. (2025) indicate that, contrary to these projections, alcohol-related deaths and hospital admissions in Wales have increased by 9.2% and 5.5% respectively since MUP was implemented.

Furthermore, drink driving related deaths have increased in Wales since MUP was implemented, while the proportion of casualties as a result of these incidents has been higher than in both Scotland and England (Livingston *et al*., 2025). The authors highlight that these unexpected results may be driven by other factors such as COVID-19, changes in costs of living and other socio-economic measures (Livingston *et al*., 2025).

This explanation highlights the importance of controlling for macroeconomic factors when evaluating the effects of MUP. The potential for omitted variable bias in the absence of such controls provides further justification for their inclusion in the CITS models employed in this study.

Ireland

Although Ireland implemented a MUP of €1.00 per unit of alcohol in January 2022, there is currently no published empirical evaluation of its impact on alcohol consumption or related harms. Recent reports by Doyle, Mongan, and Galvin (2024) and Angus (2025) provide valuable descriptive analyses of trends in alcohol consumption, pricing, and alcohol-related harms. However, these analyses are descriptive in nature and thus cannot isolate the specific effects of MUP from other time-varying influences.

Consumption and Price Effects

Angus (2025) uses quarterly data on total alcohol cleared for sale as a proxy for national alcohol consumption, reporting a 6.6% decline in per capita alcohol sales between 2019 and 2023. Doyle *et al*. (2024) similarly find that per adult alcohol consumption decreased in Ireland from 10.2 litres of pure alcohol in 2022 to 9.9 litres of pure alcohol in 2023. While these findings suggest a downward trend in alcohol consumption over time, they do not provide evidence as to whether MUP was a contributing factor.

A pre-implementation modelling study indicated that an MUP of €1.00 per unit of alcohol in Ireland is expected to decrease alcohol consumption by 8.8% per drinker per year (Angus *et al*. 2014). This projection serves as a useful benchmark against which the actual impact of the policy can be evaluated.

In terms of the long-term price trends in alcohol, Angus (2025) highlights that on-trade and off-trade alcohol prices both increased significantly immediately after MUP implementation – in line with expectations. Beer and spirits saw the largest increase in prices following MUP implementation, while wine prices increased to a slightly lesser extent in both the on-trade and off-trade channels (Angus, 2025). In theory, these price increases should lead to reductions in consumption and, in turn, alcohol-related harms. However, without robust causal modelling, the extent to which MUP has contributed to these trends remains unclear.

Alcohol Related Harms

Currently no studies have measured the impact of MUP on alcohol related harms using causal methods such as natural experiments. Modelling studies prior to the implementation of the policy predicted that an MUP of €1.00 in Ireland will lead to a reduction in alcohol-related hospital admissions as a result of acute and chronic conditions by 9% and 11% respectively (Doyle, 2023).

Conducting interviews with patients before and after MUP-implementation, Maharaj *et al*. (2024) finds a 5.7% decline in the number of alcohol-related emergency department presentations from pre- to post-MUP. However, the authors note that due to the study's limited scope and design, it is not possible to attribute this reduction directly to MUP. They further emphasise the need for future research to evaluate the policy's impact on hospital burden in Ireland (Maharaj *et al*., 2024).

Contribution to the Irish Literature

To date, no study has employed causal inference methods to evaluate the impact of MUP on alcohol consumption or alcohol-related harms in Ireland. Existing analyses are largely descriptive or based on pre-implementation modelling, and while early observational work by Doyle et al. (2024) and Angus (2025) provides useful insights, these studies do not establish causality.

This study addresses this gap in the literature by providing the first empirical evaluation of MUP in Ireland using a range of outcome measures, including alcohol consumption, on-trade versus off-trade price changes and drink-driving offences. Changes in the level and trend of alcohol consumption are measured in Ireland relative to Northern Ireland from pre- to post-MUP. In doing so, to the best of the author's knowledge, this paper also presents the first empirical study to robustly compare alcohol consumption trends between Ireland and Northern Ireland – thereby addressing a further significant gap in the existing literature.

3. Data and Methodology

3.1 Data Sources

Alcohol Consumption

Ireland

Alcohol consumption data for Ireland were sourced from the Irish Revenue Commissioners' quarterly update for alcohol. This dataset consists of quarterly quantities of alcohol cleared for sale (net paid quantities) in litres, covering the period from Q1 2018 to Q1 2024 – a sufficient period before and after the introduction of MUP to support causal inference. Net paid quantities represent the volume of alcohol on which excise duties have been paid and therefore serve as a valid proxy for alcohol consumption, in line with the approach used by Angus (2025).

The net paid quantities dataset is disaggregated into four main alcohol types, namely beer, wine, spirts and cider. For consistency in measuring pure alcohol consumption, wine and cider volumes were converted using standard alcohol by volume (ABV) percentages: 12.5% for wine and 4.5% for cider.

Northern Ireland

Consumption data for Northern Ireland are not readily available and therefore required several steps to estimate a comparable measure of alcohol cleared for sale in the country.

In 2019, HM Revenue & Customs (HMRC) provided a disaggregation of UK alcohol duty receipts by nation – England, Scotland, Wales, and Northern Ireland – from 1999 to 2019 (HM Revenue & Customs, 2019).

Using the information provided in this disaggregation of duty receipts, the following steps were undertaken to estimate alcohol cleared for sale (consumption) in Northern Ireland between 2018 and 2024:

1. The average share of UK alcohol duties attributable to Northern Ireland was calculated for each alcohol type between 2009 to 2019. These shares were relatively stable year-to-year (generally between 0.1% and 0.5%), so it was assumed that they remained constant through to 2024. The decision to use the most recent 10-year period rather than the full 1999–2019 range was based on the likelihood that more recent duty patterns better reflect the current demographic, economic, and policy

context. Older data may be less representative due to structural changes in alcohol consumption and taxation over time. Thus, using the 2009–2019 average provides a more relevant and reliable estimate for extrapolation.

2. Monthly data on the total alcohol cleared for sale, and the total alcohol duty receipts by alcohol type per month in the UK, from 2018 to 2024, were obtained from the HMRC Alcohol Bulletin archives (ONS, 2022).
3. For each alcohol type:

- The annual UK total duty receipts were multiplied by the relevant Northern Ireland share to estimate the yearly duty receipts for Northern Ireland.
- Monthly Northern Ireland estimates were obtained by distributing the annual totals according to the proportional monthly pattern of UK-wide duty receipts. This requires the assumption that Northern Ireland drinking patterns are similar to the patterns across the whole of the UK. Given the geographical and social similarities between the countries across the UK, this is likely a reasonable assumption.

4. An effective monthly duty rate per litre of alcohol was calculated by dividing UK monthly duty receipts by the quantity of alcohol cleared for sale. Since excise duty rates are uniform across all countries in the UK, this was effectively a measure of the duty rate per litre of alcohol per month in Northern Ireland (HM Revenue & Customs, 2025).
5. Finally, to calculate litres of alcohol cleared for sale in Northern Ireland each month, the following formula was applied:

$$NIR\ Alcohol\ Cleared\ for\ Sale\ (Litres) = \frac{NIR\ Duty\ Collected}{Duty\ Rate\ per\ Litre}$$

6. Monthly data were aggregated into quarters to ensure comparability with Irish data.

The final outcome measure was litres of pure alcohol consumed per adult per quarter. The per adult figure refers to the percentage of each population that is 15 years or older and was sourced from the Central Statistics Office (CSO) and Northern Ireland Statistics and Research Agency (NISRA) respectively.

Ultimately, while this overall approach provides a reasonable approximation of alcohol consumption in Northern Ireland, it relies on a couple of important assumptions. Notably, it assumes that Northern Ireland's share of UK alcohol duty receipts remained stable between

2019 and 2024, and that the seasonal distribution of alcohol consumption within Northern Ireland mirrors that of the broader UK. Although year-to-year variation in Northern Ireland's duty share was minor during the 2009–2019 period, it is still possible that post-2019 shifts in population, economic conditions, or drinking patterns may have affected these shares. Similarly, if Northern Ireland displays distinct seasonal consumption trends from the UK, this could bias the monthly estimates.

These limitations should be kept in mind when interpreting the Northern Ireland figures, though the methodological approach remains appropriate given the absence of direct consumption data and the UK-wide duty structure.

Drink Driving Offences

Quarterly data from Q1 2018 to Q4 2024 on the number of offences where an individual was driving over the legal alcohol limit[4] were obtained from the CSO[5]. Data on the number of road traffic accidents (RTAs) as a result of drink-driving are not readily available for Ireland, thus the number of offences is used as a proxy measure for accidents. This is reasonable, as it is expected that if there are fewer drink-driving offences from pre- to post-MUP, then there would also be fewer RTAs as a result of drink-driving.

Comparable data were not available for Northern Ireland, wherein offences are labelled as "offences due to drink and drug driving." It was therefore not possible to isolate the number of cases which were solely due to drink driving in Northern Ireland.

As noted in Doyle *et* al. (2023), one caveat of using the CSO data is that an observed rise or fall in the number of recorded offences may not necessarily indicate a true change in the underlying behaviour of the population. Instead, such fluctuations may reflect shifts in Garda priorities, changes in the allocation of policing resources, or targeted enforcement in specific locations or contexts (Doyle *et al.*, 2023).

Despite this, the dataset is still likely to provide an appropriate measure of how drink-driving levels have changed from pre- to post-MUP, particularly given the absence of major concurrent policy or enforcement changes during the period of study.

[4] 50 mg of alcohol per 100 ml of blood for experienced drivers, 20mg/100ml for novice, learner and professional drivers (Doyle, 2024)
[5] The data is originally from An Garda Síochána's (The Irish National Police) PULSE system, which was then aggregated and published by the CSO.

Price Changes

Changes in alcohol prices as a result of the MUP were measured using monthly alcohol CPI data for beer, wine and spirits from January 2018 to March 2025, with a base year of 2023. The data were obtained from the CSO. To measure whether there was a differential effect of the policy on prices across trade channels, the CPI data were disaggregated into on-trade (e.g. pubs, restaurants) and off-trade (e.g. supermarkets, off-licences) channels for each alcohol type.

Because off-trade alcohol is generally sold at lower prices relative to on-trade, price increases are expected to be larger in the off-trade sector, where the MUP was primarily targeted.

3.2 Empirical Strategy

This paper uses both single-group ITS (for price change and drink-driving analysis) and CITS (for consumption analysis) models to evaluate the effectiveness of MUP in Ireland. Both methods fall under the Interrupted Time Series (ITS) methodology, which is a quasi-experimental design that was first introduced to social science research by Campbell & Stanley (1963) as a way to detect any shift in the level or trend of an outcome that results from a clearly defined, external intervention, using regularly spaced data points over time (Berk, 2022; Kontopantelis *et al*., 2015). The methodology is commonly used to evaluate public health interventions at the population level over time (Bernal, Cummins & Gasparrini, 2016).

The ITS methodology is well-suited to this study, given the availability of multiple, evenly spaced (quarterly) observations before and after the implementation of MUP. Unlike other quasi-experimental designs such as DID, which focuses primarily on differences in average outcomes between treatment and control groups before and after an intervention, a single-group ITS estimates changes in both the level (i.e., immediate jump) and the slope (i.e., trend over time) of the outcome following the policy. CITS expands on single-group ITS by further measuring whether the pre- to post-intervention difference in slopes between two groups (treatment and control) is significant (Wharton, 2020).

Single-group ITS models typically follow the general equation given below:

$$Y = b_0 + b_1T + b_2X + b_3XT + e$$

Where T is a continuous time variable since the start of the observation period, which measures the slope of outcome before the intervention, and XT is the time since the policy implementation, which measures the slope of the outcome after the intervention (Caswell, n.d.; Lecy & Fusi, n.d.).

Comparatively, CITS models typically follow the formula:

$$Y = b_0 + b_1T + b_2X + b_3XT + b_4Z + b_5ZT + b_6ZX + b_7ZXT + e$$

Which expands on the single-group ITS by including interaction terms to separate out the effect of the intervention on the treatment and control groups. The models used in this paper will adapt these equations in order to answer the three research questions outlined in this research.

Consumption

In line with the methodologies used in previous empirical studies, this paper uses a CITS design, with Northern Ireland as the control group, to determine whether the MUP was associated with a significant reduction in alcohol consumption in Ireland. Northern Ireland was selected as a suitable control group due to its geographic and socio-economic similarities with Ireland, and because it has not yet implemented MUP.

CITS is used to compare changes in the outcome variable – in this case, quarterly litres of pure alcohol consumed per adult – between a treatment group (Ireland) and a control group (Northern Ireland) over time. By incorporating a control group that was not exposed to the intervention, CITS helps adjust for external factors and underlying trends that could influence the outcome independently of the policy, thereby resulting in a robust estimate of the treatment effect over time (Mitchell *et al.*, 2025).

The following regression equation was used for the CITS:

$$\begin{aligned} Litres\ Per\ Adult_{it} &= \beta_0 + \beta_1 \cdot Treatment_i + \beta_2 \cdot (time_t \times Treatment_i) + \beta_3 \\ &\cdot (Treatment_i \times Post_t) + \beta_4 \cdot (time_t \times Post_t \times Treatment_i) + X'_{it}\beta + \gamma_t \\ &+ \varepsilon_{it} \end{aligned}$$

Where:

$Treatment_i$ is a dummy variable equal to 1 for the treatment group (Ireland) and 0 for the control group (Northern Ireland), while $time_t$ is a continuous variable indicating the number of time periods (e.g., quarters) since the start of the study (Q1 2018). It is used to estimate the underlying trend (slope) in the outcome variable before the intervention, and – through interaction with the post-intervention indicator – it also allows the model to estimate any change in trend after the policy was introduced.

$Litres\ Per\ Adult_{it}$ = Alcohol consumption per adult in region *i* in quarter *t*.

β_0 = Baseline level for the control group at time zero.

$\beta_1 \cdot Treatment_i$ = Measures the baseline difference in alcohol consumption between the treated and control groups before the intervention.

$\beta_2 \cdot (time_t \times\ Treatment_i)$ = Captures the difference in pre-intervention trend between treated and control groups.

$\beta_3 \cdot (Treatment_i \times\ Post_t)$ = Level change in the treated group immediately after the intervention.

$\beta_4 \cdot (time_t \times\ Post_t \times\ Treatment_i)$ = The differences in the slope change between pre- and post-intervention periods between Ireland and Northern Ireland.

$X'_{it}\beta$ = Matrix of additional time-varying, region-specific covariates that are likely to affect alcohol consumption levels (e.g. quarterly unemployment and GDP growth)

γ_t = Quarter fixed effects to control for any quarterly shocks that are common to both regions (e.g. COVID restrictions and seasonal drinking patterns)

ε_{it} = Error term

The main model includes quarter fixed effects to account for unobserved time-varying shocks common to both regions. This ensures that the estimated treatment effect reflects changes in the treated group relative to the control group, net of broader temporal influences. The caveat of using a fixed effects model is that the control group is assumed to have a constant trend from pre- to post-policy implementation (hence the variable $time_t$ is only included as an interaction with the treatment group in this model). In light of this, an additional model without fixed effects, which includes $time_t$ on its own to capture the pre-policy trend in the control group, along with a Post × time interaction to allow for a post-intervention trend change in the control group, was estimated as a robustness check.

Drink Driving

As there were no comparable data on the number of drink-driving offences between Ireland and Northern Ireland, the ITS analysis for this component of the paper is only conducted within Ireland – and does not include a control group. The dependent variable is the number of recorded crime incidents where an individual was driving/in charge of a vehicle while over the legal alcohol limit. To account for fluctuations in road activity over time, the outcome was standardised to reflect offences per million litres of fuel, using quarterly fuel excise clearance data for private vehicles, from the CSO.

The single-group ITS model estimates whether the trend in drink-driving offences changed significantly following the introduction of MUP in January 2022. The intervention effect is measured by comparing the pre-intervention and post-intervention trends within the same group (Ireland) to determine whether the policy was associated with a significant level or slope change in the outcome variable (Mitchell et al., 2025).

A COVID dummy variable was included due to the significant decline in road activity during this period, as a result of lockdown restrictions enforced throughout the country. Similarly to the CITS model, $Time_{\mathrm{t}}$ is a continuous variable that measures the number of quarters that have passed since the start of the time series.

The following ITS regression equation was estimated:

$$Y_{\mathrm{t}} = \beta_0 + \beta_1 \cdot Time_{\mathrm{t}} + \beta_2 \cdot Intervention_{\mathrm{t}} + \beta_3 \cdot PostTime_{\mathrm{t}} + \beta_4 \cdot COVIDPeriod_t + \varepsilon_{\mathrm{t}}$$

Where:

$Y_{\mathrm{t}} =$ The number of drink driving offences per million litres of fuel in quarter t

$\beta_1 =$ Baseline trend in offences before the introduction of MUP

$\beta_2 =$ Level change in offences immediately after the introduction of MUP

$\beta_3 =$ Change in trend in drink-driving offences post-MUP

$\beta_4 =$ COVID dummy variable to account for the large decrease in the number of drivers on the road during this period (equal to 1 if the time period is between April 2020 to December 2021, otherwise 0)

Price Changes

Northern Ireland measures the combined CPI of alcohol and tobacco products and therefore could not be used as a control group in a CITS analysis. As a result, this section uses a single-group ITS approach without a control group – in the same manner as the drink-driving offences analysis – to assess the impact of MUP on alcohol prices in Ireland.

Despite the absence of a control group, ITS remains a valid quasi-experimental design in this context. The MUP policy is expected to have a direct and immediate effect on alcohol prices, particularly in the off-trade sector, and there are no major time-varying confounders likely to independently cause similar changes in price during the intervention period. Therefore, statistically significant level or trend changes in alcohol prices post-MUP can be reasonably interpreted as being attributable to the policy itself, without the need for a control group in the analysis (Bernal *et al*., 2016).

The aim of this section is to determine whether the MUP had a statistically significant differential effect on off-trade versus on-trade alcohol prices. To measure this, the CPI values for all off-trade and on-trade alcohol products were separately aggregated. An ITS model with additional interaction terms for trade type (on-trade vs off-trade) were used to formally test for differences in the level and slope of CPI changes between the two groups.

The estimated ITS equation for measuring changes in the price level of alcohol is given by:

$$CPI_{it} = \beta_0 + \beta_1 \cdot Time_t + \beta_2 \cdot Intervention_t + \beta_3 \cdot PostTime_t + \beta_4 \cdot OffTrade_i + \beta_5 \cdot (Time_t \times OffTrade_i) + \beta_6 \cdot (Intervention_t \times OffTrade_i) + \beta_7 \cdot (PostTime_t \times OffTrade_i) + \varepsilon_{it}$$

Where:

CPI_{it} = Alcohol CPI for trade channel *i* in quarter *t*

$OffTrade_i$ = A dummy variable equal to 1 for Off-Trade, and 0 for the base category, On-Trade

And the interaction terms:

β_5 : Tests whether the pre-intervention trends in CPI differ between off- and on-trade channels.

β_6 : Captures the differential level change in CPI for on-trade versus off-trade immediately after MUP was introduced.

β_7 : Captures the differential, post-MUP, trend for off-trade versus on-trade alcohol CPI.

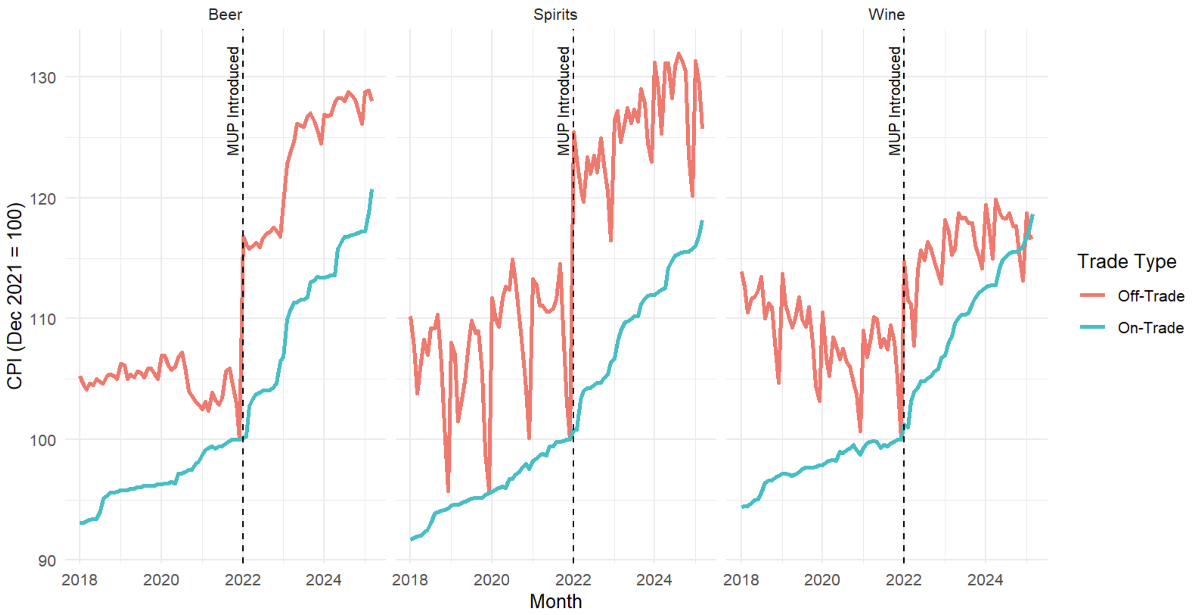
4. Results

4.1 Descriptive Statistics

Price Changes

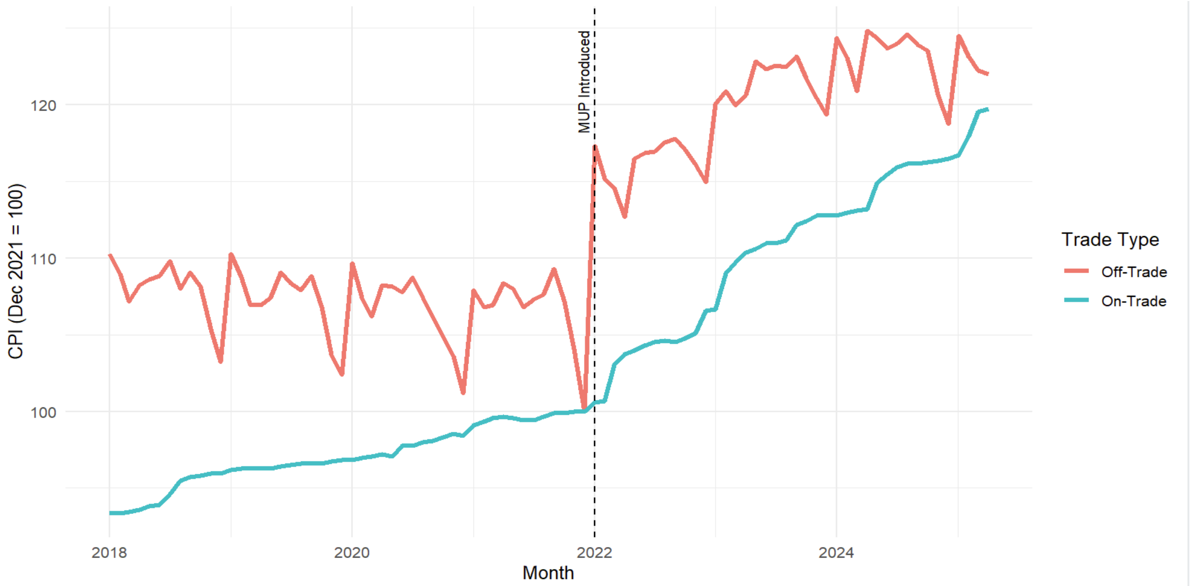
Figures 1 and 2 display trends in monthly alcohol CPI from January 2018 to January 2025, using December 2021[6] as the base period to isolate price changes occurring after the introduction of MUP. CPI values reflect changes in average alcohol prices over time and are used interchangeably with price changes throughout this section.

Figure 1: CPI Trends for Beer, Wine and Spirits



[6] CSO only has data with 2003, 2016 and 2023 as base years for their CPI measures. I rebased the 2023 values manually to get December 2021 as the base period using the formula $CPI_{Rebased} = \frac{CPI_t}{CPI_{December\ 2021}} * 100$

Figure 2: CPI Trend for all On-Trade and Off-Trade Alcohol



All alcohol types sold at off-trade channels display a significant upward jump in CPI in January 2022 – immediately after MUP was implemented. In contrast, on-trade alcohol CPIs follow a gradual upward trend over the sample period and exhibit only a small increase after the policy was implemented.

The CPI of off-trade spirits experienced the largest increase, increasing by 25% (100 in the base period, December 2021, to 125 in January 2022) immediately after MUP was implemented. In comparison, the CPI of on-trade spirits increased by just 0,7% immediately after the introduction of MUP. Similarly, off-trade beer and wine CPIs increased by 16,8% and 14,17% respectively, while their on-trade counterparts increased by just 0,1% and 1,2% after MUP was introduced. Aggregating across all alcohol types, off-trade prices increased by 17.3% immediately after MUP, while on-trade prices rose by just 0.5%.

Notably, the trend in off-trade alcohol prices also changed with the introduction of MUP. Prior to implementation, off-trade prices were relatively stable or declining. However, post-MUP, off-trade alcohol CPI display a sustained upward trend over time. For example, off-trade beer prices increased a further 12 percentage points between February 2022 and March 2025, meaning that the price of off-trade beer increased by 28% from pre- to post-MUP. In comparison, off-trade beer prices had fallen by 5.2% between January 2018 and December 2021. On-trade alcohol prices, meanwhile, continued their long-term gradual increase over time.

The observed differences between on-trade and off-trade CPI are in line with expectations, given that prices are typically lower in off-trade channels relative to on-trade channels. As a result, all alcohol that was priced below the minimum threshold would have increased immediately after the policy was implemented. Because spirits have the highest alcohol content, their effective price floor under MUP is also higher, which explains the disproportionately large CPI increase for off-trade spirits.

Ultimately, while the discussion here is only descriptive in nature, the findings suggest that MUP was associated with significant price increases for off-trade alcohol – which, at the very least, suggests that compliance with the policy is high. These preliminary findings are formally tested in the following section using a CITS design.

Drink Driving Offences

Figures 3 and 4 display the trend in quarterly drink driving offences between Q1 2018 to Q4 2024. Figure 3 values are standardised per million litres of fuel cleared for sale, while figure 4 displays the raw counts of drink-driving offences per quarter.

Figure 3: Quarterly Drink-Driving Offences per Million Litres of Fuel

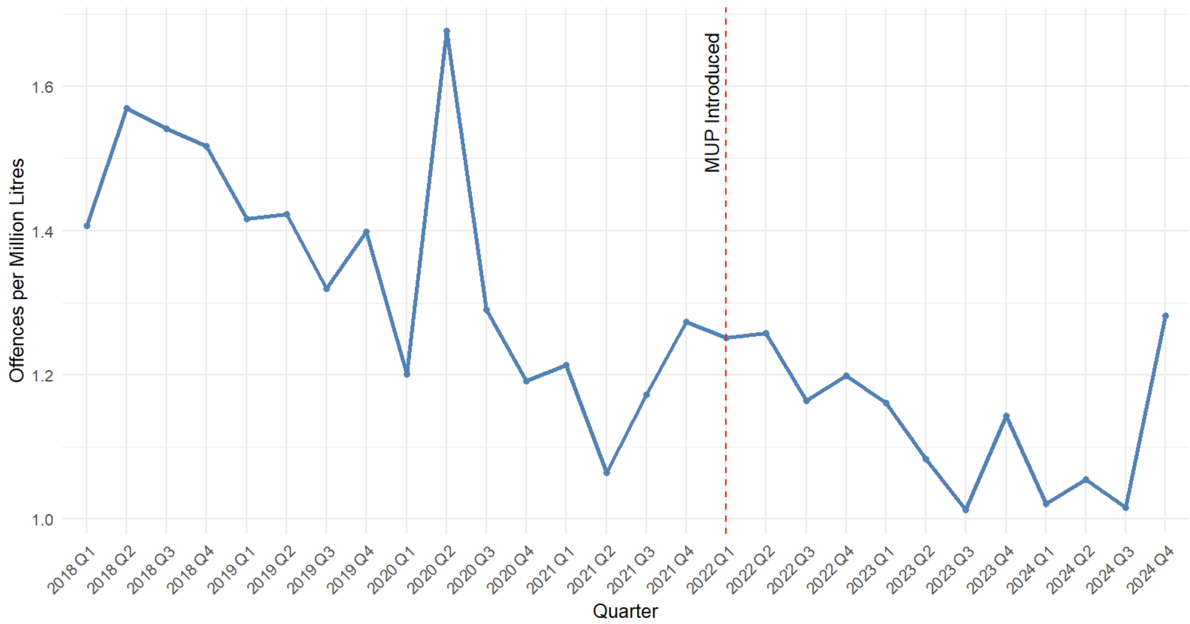
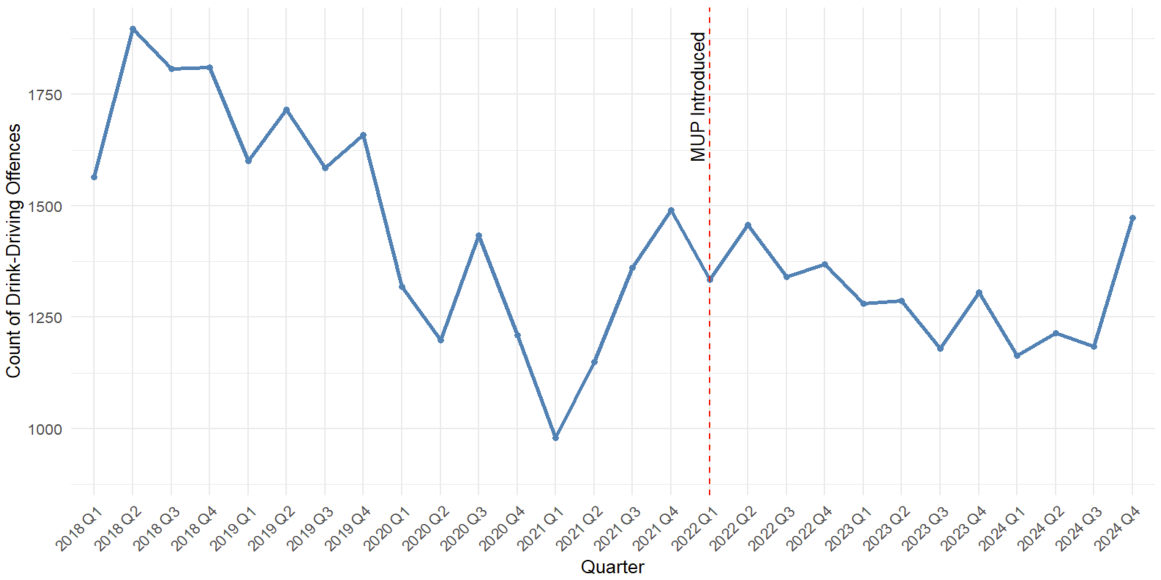


Figure 4: Quarterly Count of Drink-Driving Offences



The figures indicate there has been a general decreasing trend in offences over time, from 1.4 offences per million litres in Q1 2018, to 1.28 in Q4 2024 – representing an overall decline of approximately 8.5%. A notable spike is observed in Q2 2020, where the offence rate increased by 28% relative to Q1 2020. However, this was likely due to a sharp decline in fuel consumption at the onset of the COVID-19 pandemic, rather than a genuine broad-level increase in drink-driving behaviour. This interpretation is supported by Figure 4, which indicates that the raw count of drink-driving offences actually decreased by 9.2% between Q1 2020 to Q2 2020. These sudden and significant changes in trends highlight the importance of controlling for COVID related disruptions in the forthcoming ITS analysis to more accurately isolate the impact of MUP on drink-driving offences.

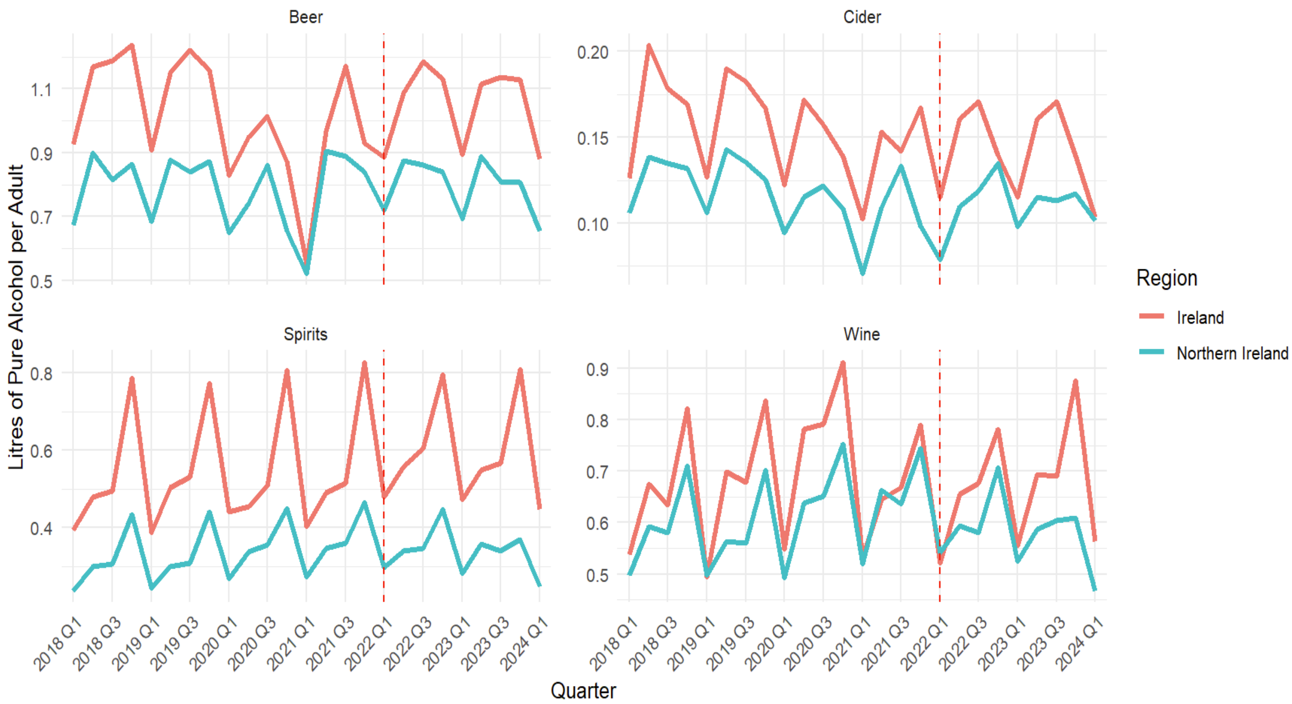
Notably, the trend in offences in both figures does not display a clear shift from pre- to post-MUP – suggesting the policy has not significantly impacted drink-driving offences. However, it is important to reiterate that the observed trends in the data may be representative of changing Garda enforcement priorities, rather than genuine behaviour shifts over time. This is particularly evident in Q4 2024, where both the offence rate and count increased sharply – by 26.7% and 24.3%, respectively, from the previous quarter. Such a sudden rise is unlikely to be driven by behaviour change alone and more plausibly reflects increased Garda enforcement activity during this period.

Consumption

Figures 5 and 6 plot the quarterly trends in the litres of pure alcohol consumed per adult in Ireland and Northern Ireland between Q1 2018 and Q1 2024, both overall and by beverage type (beer, wine, spirits, and cider). Adult populations refer to the number of people in each region that are 15 years or older – which were obtained using yearly estimates collected by the CSO and NISRA[7].

On average, Ireland displays consistently higher levels of pure alcohol consumed per capita. For example, in 2023, the amount of pure alcohol consumed per adult was approximately 10,07 litres in Ireland compared to 7.3 litres in Northern Ireland[8]. This difference is largely driven by Ireland's significantly higher spirits consumption levels, which are between 0.3 to 0.4 litres higher than Northern Ireland on average per quarter.

Figure 5: Alcohol Consumption per Adult by Type



The disparity between regions is unsurprising given Ireland's significantly higher GDP per capita and disposable income levels. In 2018, Ireland's household disposable income was 18,3% greater than Northern Ireland, while in 2022, Ireland's GNI per capita[9] was 57% higher than Northern Ireland's GDP per capita (Economic and Social Research Institute,

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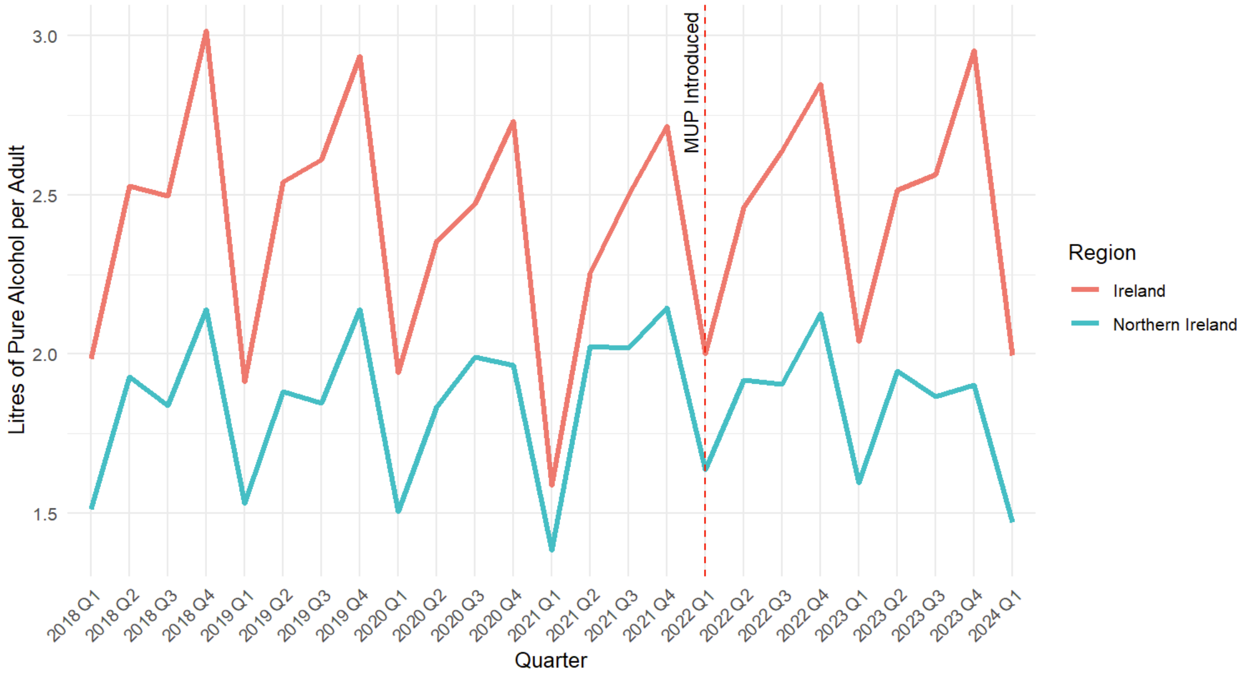
[7] The CSO provides estimates of "Persons in April," while the NISRA provide mid-year population estimates.
[8] The full table of yearly estimates is available in the Appendix (Table A1)
[9] GNI per capita is a more useful comparison than GDP in Ireland, as GDP is affected by the large number of multi-national companies operating within the country (Campbell, 2024).

2025). Coupling this with the significantly larger tourism sector in Ireland relative to Northern Ireland (Ulster University, 2024), it is unsurprising that a significant disparity exists in terms of alcohol consumption between the two regions.

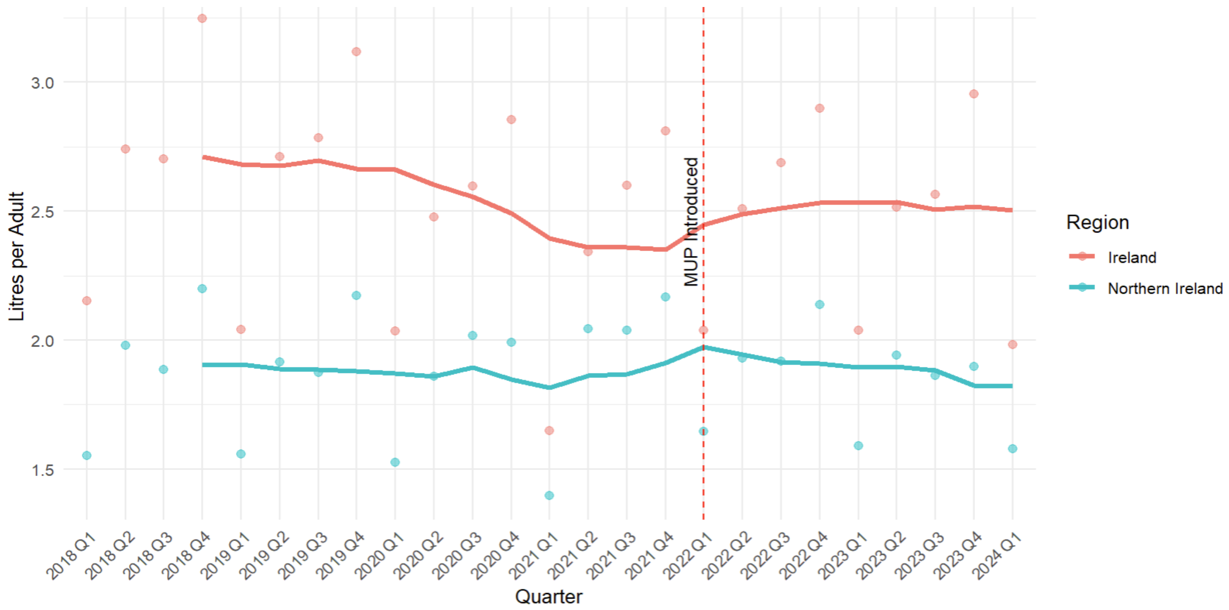
Figure 6: Overall Alcohol Consumption per Adult Over Time



Despite the overall differences in consumption, both regions follow clear seasonal patterns, with consumption distinctly peaking during the winter months before falling in the summer months – likely reflecting holiday related consumption. A notable dip in overall consumption is observed in Q1 2021, particularly in Ireland, which appears to be driven by a substantial decline in beer consumption. Consumption of other alcohol types remained relatively stable during this period. The sharper reduction in Ireland compared to Northern Ireland may be attributable to COVID-19 restrictions, which heavily impacted Ireland's tourism sector and on-trade alcohol sales, contributing to the overall decline.

To better assess long-term trends by removing seasonality, Figure 7 plots the 4-quarter rolling average against the raw counts of overall consumption per adult. Both regions display a dip in consumption during the pandemic, before gradually recovering towards pre-pandemic levels at different rates. Notably, Ireland experienced a substantially larger decline in consumption relative to Northern Ireland during the COVID-19 period.

Figure 7: Rolling Average and Raw Consumption per Adult



To explore one possible explanation for this disparity, tourism figures offer useful context. According to data from the CSO, Ireland recorded approximately 1.162 million foreign visitors in Q1 2023 and 1.407 million in Q1 2024 (CSO, 2025). In contrast, Northern Ireland had 560 094 and 546 153 visitors in the same quarters, respectively – representing 51.79% and 61.18% fewer foreign visitors in those time periods (NIRSA, 2024). Although data for the pandemic years (2020–2022) is unavailable, this significant gap in international tourism likely contributed to the more pronounced dip in alcohol consumption observed in Ireland during the pandemic.

Immediately after the MUP introduction, Ireland's alcohol consumption per adult began to increase more steeply, rising from approximately 2.30L to around 2.50L by mid-2023. However, it is important to note that this is likely due to the long-term recovery of the market, post-pandemic – and should not be attributed to the MUP having an unexpected effect on consumption. This interpretation is supported by the fact that Ireland's post recovery consumption levels remain slightly lower than pre-pandemic consumption levels (10.133 litres per adult in 2022 compared to 10.654 in 2019). In comparison, Northern Ireland's post-pandemic peak occurred in Q1 2022 – wherein consumption was approximately 1.95L per adult – after which consumption began to gradually decline again to just above its pre-pandemic levels (7.634 litres per adult for the entire 2022, relative to 7.519 in 2019).

Crucially, the trends highlighted here are unlikely to be related to the policy implementation itself, and are instead likely a representation of broader economic downturns and bounce-backs in response to the pandemic. As such, formal CITS estimation – employed in the following section – is required to rule out remaining confounders and quantify the policy effect precisely.

4.2 Regression

Drink Driving Offences: Interrupted Time Series Analysis

Table 1 presents the results of single-group ITS regressions with quarterly drink-driving offences per million litres of fuel in Ireland as the dependent variable. There are 28 observations in each model, representing the number of quarters from Q1 2018 to Q4 2024. The model explains approximately 67% of the variation in the outcome ($R^2 = 0.671$) and is statistically significant overall ($F(4, 23) = 11.72$, $p < 0.01$).

Table 1: Drink Driving ITS and Robustness Check Models

	Dependent variable:	
	Drink-Driving Offences per Million Litres	
	Simple Model	Covid Phases Model
Time Trend	-0.039***	-0.026***
	(0.012)	(0.005)
Intervention (Post-Jan 2022)	0.255	0.093
	(0.158)	(0.070)
Post:Time	0.027*	0.013
	(0.015)	(0.009)
Covid Period	0.161	
	(0.110)	
Covid Lockdown Phase 1		0.383***
		(0.092)
Covid Reopen		-0.015

		(0.069)
Constant	0.951^{***}	1.114^{***}
	(0.146)	(0.051)
Observations	28	28
R^2	0.671	0.802
Adjusted R^2	0.614	0.757
Residual Std. Error	0.111 (df = 23)	0.088 (df = 22)
F Statistic	11.717^{***} (df = 4; 23)	17.792^{***} (df = 5; 22)

Overall, the findings suggest that MUP was not associated with a reduction in drink-driving offences from pre- to post-implementation. Prior to the policy implementation, drink-driving offences displayed a significant downward trend ($\beta_1 = -0.039, p < 0.01$), indicating an average decrease of 0.039 offences per quarter.

The coefficient on the *Intervention* variable, which captures the immediate level change after MUP, is statistically insignificant, suggesting no abrupt shift in offences at the time of policy implementation. However, the results indicate a slight upward trend in offences post-MUP – indicated by the positive and, weakly, significant coefficient on the *Post:Time* interaction ($\beta_3 = 0.027,\ p < 0.10$). This result implies that, relative to the pre-policy downward trend, offences increased by 0.027 per quarter following MUP implementation.

Sensitivity Analysis and Robustness Checks

The above findings should be interpreted with caution. The original model included a single COVID-19 dummy variable to account for the entire period April 2020 to December 2021, which may have obscured short-term fluctuations in drink-driving offences during periods of strict lockdowns and reopening. To address this, a robustness check was conducted (Column 2, Table 1) by estimating a model that included separate indicators for different phases of the pandemic, including the initial lockdown (March 27, 2020 to June 29, 2020) and subsequent reopening (post-June 29, 2020).

The results in column 2 indicate that the previously significant post-MUP trend increase is no longer statistically significant, and overall model fit improves substantially ($R^2 = 0.802$ vs. 0.671). This suggests that the apparent post-MUP increase in offences observed in the simpler model was likely confounded by unmodelled COVID-related volatility. This interpretation is supported by the significant and positive coefficient on the *Covid Lockdown Phase 1* variable ($\beta_5 = 0.383,\ p < 0.01$) in the second model, which is likely caused by the drop in fuel consumption in response to COVID-19 related restrictions. Crucially, the first model failed to account for this, and therefore produced biased estimates. The robustness model therefore provides a more credible estimate and reinforces the conclusion that MUP did not have a significant impact on drink-driving offences.

As an additional diagnostic, residual autocorrelation was tested using the Durbin-Watson (DW) test statistic, as well as visual inspection of autocorrelation function (ACF) plots (Appendix). The DW test statistic was 1.71 for the original model and 1.75 for the robustness model, with corresponding p-values of 0.056 and 0.076, respectively. While the results are marginally close to the 5% significance level, the ACF plots did not show significant autocorrelation beyond lag zero. Given the lack of strong evidence for serial correlation, standard OLS errors were retained.

In sum, these findings indicate that while initial models suggested a post-MUP increase in drink-driving offences, this effect is no longer observed once COVID-related volatility is modelled more precisely. The significant spike observed during the initial lockdown highlights the distorting effect of reduced fuel consumption on the outcome variable. Ultimately, the results provide no evidence of a statistically significant level or trend change in drink-driving related offences, following MUP implementation.

Price Changes

Table 2 provides the estimates of the ITS regression with alcohol CPI as the dependent variable. Heteroskedasticity- and autocorrelation-consistent (HAC)[10] standard errors are reported, as autocorrelation was detected in both models based on significant Durbin-Watson test statistics (see Appendix). There are 176 observations in both models as each month between January 2018 and March 2025 included two observations (one for off-trade and one for on-trade CPI).

[10] Newey-West standard errors adjust for both heteroskedasticity and autocorrelation in time series regression models (Hanck *et al.*, 2024).

The base model results indicate that there was an immediate increase in both on-trade and off-trade prices following the introduction of MUP , with off-trade prices rising significantly more than on-trade prices – consistent with prior expectations. Specifically, on-trade prices increased by 1.17 points ($p < 0.05$) immediately after MUP, while off-trade prices increased by approximately 10.21 points (9.038 + 1.17; $p < 0.01$) after the policy was introduced.

Prior to MUP, off-trade prices were increasing at a significantly slower rate than on-trade prices (–0.198 points/month; $p < 0.001$). This differential trend aligns with the descriptive statistics, which showed that on-trade prices were steadily increasing prior to the MUP, while off-trade prices were relatively stable pre-MUP. After the policy, on-trade prices continued rising at a rate of 0.315 points/month ($p < 0.001$). Conversely, off-trade prices did not experience a significantly change in their post-policy trend (PostTime:Off-Trade = –0.033, $p = 0.54$).

Table 2: ITS Models for On-Trade vs Off-Trade CPI

	Dependent variable:	
	Alcohol CPI	
	Base Model	Robustness Check
Time (On-trade trend)	0.137***	0.095***
	(0.016)	(0.023)
Trade Type (On-Trade)	14.896***	14.896***
	(0.652)	(0.634)
Lockdown 1		0.041
		(0.631)
Reopen		0.357
		(0.612)
General CPI		0.328***
		(0.113)
Wage Inflation		0.017
		(0.014)
Intervention (On-trade level change)	1.172*	-0.464
	(0.675)	(0.871)

Post:Time (On-trade post-MUP trend)	0.315***	0.227***
	(0.027)	(0.042)
Time:Off-Trade (Off-trade pre-MUP trend)	-0.198***	-0.198***
	(0.023)	(0.023)
Intervention:Off-Trade (Off-trade level change)	9.038***	8.703***
	(0.955)	(0.958)
PostTime:Off-Trade (Off-trend post-MUP trend)	-0.033	-0.008
	(0.038)	(0.041)
Constant	93.732***	90.501***
	(0.461)	(5.018)
Observations	176	176
R^2	0.971	0.972
Adjusted R^2	0.970	0.970
Note:	*p<0.1; **p<0.05; ***p<0.01	

These results suggest that MUP was associated with a sharp, one-time increase in off-trade alcohol prices. The lack of a long-term, post-intervention trend change (statistically insignificant coefficient of the PostTime:Off-Trade interaction) suggests that the impact of the policy was immediate. This finding indicates that compliance with MUP is high, with off-trade retailers adjusting prices quickly in response to the new minimum price floor. This is consistent with the policy's intended effect of raising the cost of cheap, high-strength alcohol in off-trade settings.

Notably, the results suggest that the post-MUP trend in on-trade prices was significantly steeper than the pre-MUP trend (post:time coefficient, $B_8 = 0.315; p < 0.001$). Given that prices are already relatively higher in on-trade locations, finding that prices increased at an increasing rate post-MUP was an unexpected result. Thus, to test whether this increase was driven by external factors unrelated to MUP, such as rising wages or general inflation, a robustness check was conducted using an ITS model that included wage and CPI variables, as well as controls for COVID-19 restrictions.

The results of the robustness check, column 2 of table 3, are largely consistent with the original model. The only notable difference was that on-trade prices no longer experienced a significant level increase post-MUP – indicating that the significant result in the original model may have been driven by broader price or wage increases occurring at the same time as MUP.

Ultimately however, the findings provide strong evidence to suggest that MUP was associated with significant and immediate price increases for both on-trade and off-trade channels. Off-trade alcohol prices increased significantly more than on-trade prices immediately after MUP, however their trend remained stable post-implementation. In contrast, on-trade prices experienced a smaller immediate increase, but continued to rise at a faster rate relative to pre-MUP.

Consumption

Table 3 includes two CITS models, with Ireland as the treatment group and Northern Ireland as the control group. Both models include 50 observations, based on quarterly data from Q1 2018 to Q1 2024 for each region (25 quarters × 2 regions).

The first specification includes quarter fixed effects, which control for time-varying shocks common to both regions (such as seasonality, or COVID-related disruptions). However, due to multicollinearity, this model does not allow for a time trend in the control group – and therefore assumes a constant trend in Northern Ireland's consumption per adult over time.

To address this limitation, a second model is estimated without quarter fixed effects. This allows for an estimation of the consumption trend in the control group while also allowing for the inclusion of time-varying covariates such as COVID lockdown indicators. While this version does not control for unobserved time shocks as precisely, it offers a more flexible structure for measuring changes in consumption trends across both groups – and is therefore the model specification that has typically been used in previous MUP evaluations conducted in other countries.

Together, these models provide a robust measure of how alcohol consumption has changed over time in both of these regions, from pre- to post-MUP.

Table 3: CITS for Overall Alcohol Consumption

	Dependent variable:	
	Litres Per Adult	
	FE	No FE
Treatment (Ireland dummy variable)	0.858	0.687**
	(0.858)	(0.270)
Time (NIR trend pre-MUP)		0.008
		(0.010)
Unemployment	-0.150	-0.038
	(-0.150)	(0.079)
GDP Growth	-0.012	-0.030
	(-0.012)	(0.019)
Lockdown1		-0.411*
		(0.217)
Reopen		0.577*
		(0.306)
Post:Time (NIR trend post-MUP)		-0.036
		(0.029)
Treatment:Time (Ireland vs NIR trend pre-MUP)	-0.021	-0.015
	(-0.021)	(0.017)
Treatment:Post (Ireland vs NIR level change post-MUP)	-0.012	-0.088
	(-0.012)	(0.257)
Treatment:Time:Post (Ireland vs NIR slope change post-MUP)	0.038	0.032
	(0.038)	(0.041)
Constant	1.914	2.077***
	(1.914)	(0.274)
Quarter Fixed Effects	Yes	No

Observations	50	50
R^2	0.964	0.560
Adjusted R^2	0.907	0.447
Residual Std. Error	0.140 (df = 19)	0.342 (df = 39)
F Statistic	16.966*** (df = 30; 19)	4.967*** (df = 10; 39)
Note:	*p<0.1; **p<0.05; ***p<0.01	

Notably, both specifications indicate that MUP has had no statistically significant effect on alcohol consumption per adult in Ireland. The coefficient on the interaction Treatment:Post – which shows the immediate change in Ireland's consumption following the introduction of MUP relative to Northern Ireland – is statistically insignificant in both model specifications.

Similarly, the coefficient on the triple interaction term, Treatment:Time:Post, which estimates the difference in consumption trends post-MUP between the two regions, is also insignificant in both models.

Taken together, these results indicate that there is insufficient evidence to conclude that the level or trend in alcohol consumption per adult changed in Ireland relative to Northern Ireland following the implementation of MUP.

Robustness Checks

Several robustness checks were run to assess the reliability of the main findings.

First, a single-group ITS model – using only Irish data – was run to test whether there were statistically significant changes in alcohol consumption from pre- to post-MUP in Ireland (Appendix, Table A2). The benefit to running a model of this type is that it shows absolute changes in consumption in Ireland, rather than changes in consumption relative to Northern Ireland. Similarly to the CITS, the single-group ITS model found no statistically significant change in either the level or trend of alcohol consumption post-MUP, further supporting the conclusion that the policy did not significantly reduce per capita alcohol consumption in Ireland.

Disaggregated CITS models were also estimated for specific alcohol types: beer, ciders, spirits and wine (Appendix, Table A3). These models were used to test whether MUP may have impacted the consumption of certain beverage types more than others. In line with the previous results, none of the category-specific alcohol types experienced significant changes in the level or trend of consumption from pre- to post-MUP in Ireland, relative to Northern Ireland.

To test for potential stockpiling of alcohol prior to the implementation of MUP, an additional model was estimated that included a dummy variable for Q4 2021 – the final quarter before the policy came into effect (Appendix, Table A4). The coefficients on the dummy variables and their interactions were statistically insignificant, indicating there was no evidence of a significant increase in alcohol purchases prior to MUP in either region.

As with all ITS models in this paper, autocorrelation in the residuals was tested for by performing DW tests. The DW test statistic for the CITS with fixed effects (column 1) was insignificant, indicating no autocorrelation of the residuals, hence OLS standard errors were used for this model. Conversely, the DW test statistic and ACF plots for the model without fixed effects (column 2) indicated significant autocorrelation in the residuals, as such Newey-West standard errors were estimated for this model.

5. Discussion and Limitations

The findings of this study suggest the MUP has had no statistically significant effect on alcohol consumption in Ireland. This result holds consistently across multiple model specifications and robustness checks, including both CITS and single-group ITS models. While this may appear to indicate the policy has failed in its aims, it is important to analyse these results in the broader context of the MUP and its intended effects.

Target Population and Policy Scope

MUP is specifically designed to reduce consumption of high-strength, low-cost alcohol by disproportionately increasing the price of these products. The policy is therefore targeted towards the heaviest drinkers, who are the most likely to seek the highest alcohol content for the lowest cost. While this study has shown the MUP to be ineffective at reducing overall consumption, the results say nothing about how the policy has impacted consumption across the different levels of drinkers in Ireland. Therefore, it remains possible that MUP has achieved its goal of reducing consumption amongst Ireland’s heaviest drinkers – the group most likely to be affected by the observed price increases.

To say anything substantive about the effect of MUP across the distribution of drinkers, future research would require access to long-term individual-level panel data that includes self-reported consumption levels for different levels of drinkers.

Short vs Long-Term Effects

It is also worth noting that while the results here point towards the MUP having no significant effect on consumption in the two years since its implementation, it is possible that the long-term trends in alcohol consumption may be significantly impacted. For example, individuals turning 18 after the policy's implementation may face higher alcohol prices throughout their early adulthood, potentially reducing alcohol initiation or consumption over time. If this is the case, the MUP can be expected to cause a more gradual, long-term downward trend in Ireland over time.

Limitations of the Consumption Proxy

While using alcohol cleared for sale is a generally accepted proxy for alcohol consumption in the empirical literature (Angus, 2025), it does not provide an exact measure of alcohol consumption. The two most notable reasons for differences between actual consumption and the amount of alcohol cleared for sale are cross-border purchasing and stockpiling.

For example, because alcohol prices are typically lower in Northern Ireland relative to Ireland (with the difference between the two likely widening since MUP) it is possible that Irish consumers living near the border may opt to purchase alcohol in Northern Ireland. Under this scenario, alcohol cleared for sale underestimates the true amount of consumption in Ireland – and overestimates the true consumption level in Northern Ireland. While these effects have the potential to bias results, because cross-border purchases are likely to only occur near the border it is unlikely that the scale of these purchases are so significant and widespread to greatly affect the findings of this paper. Nonetheless, studying the trends of cross-border purchases from pre- to post-MUP could be a useful avenue for further research into the true effect of the policy on consumption levels.

Similarly, stockpiling of alcohol is another factor that total alcohol cleared for sale fails to capture. If consumers purchased large quantities of alcohol in the quarter prior to January 2022 (Q4 2021) in anticipation of MUP, alcohol cleared for sale in that period would be artificially inflated, while post-MUP clearances might appear lower than they truly are. Although no strong evidence of stockpiling was found in this study, the possibility remains a caveat when interpreting the timing of the policy's effects.

Another potential limitation of using alcohol cleared for sale per adult as a proxy for consumption is the effect of tourism. Ireland's large tourism industry may introduce variation in alcohol sales that is not captured by population estimates. If some quarters have significantly higher numbers of foreign tourists coming into the country than others, then per adult alcohol consumption figures may be artificially inflated, as tourists are not included in the population denominator. Although such fluctuations may average out over time, they could introduce noise into quarterly consumption estimates – particularly during post-COVID tourism rebounds.

Limitations of Northern Ireland Data

Finally, it is worth reiterating that Northern Ireland's alcohol cleared for sale figures are estimations that have been derived based on the region's share of total UK alcohol duty receipts. If Northern Ireland's share of total UK alcohol consumption changed significantly after 2019, or if its seasonal drinking patterns differ materially from the rest of the UK, then the region's consumption estimates will be biased.

To account for the fact that Northern Ireland's consumption figures are estimated, a single-group ITS model using only Irish data was also run. The results mirrored those of the CITS model, showing no significant change in either consumption level or trend post-MUP. Ultimately, this consistency in findings reinforces the conclusion that MUP did not led to a measurable reduction in alcohol consumption in Ireland, during the first two years of implementation.

6. Conclusion

This paper has presented the first empirical evaluation of MUP in Ireland since its introduction in January 2022. Furthermore, it is also the first study to robustly compare alcohol consumption trends in Ireland and Northern Ireland using publicly available data. Using CITS and single-group ITS models (which have been widely used in previous MUP evaluation studies conducted elsewhere) this paper presents three key findings regarding the policy's early impacts.

Firstly, the analysis finds no evidence to suggest that MUP was associated with a reduction in drink-driving offences in Ireland. While these results should be interpreted with caution – as changes in offence counts may reflect shifts in Garda enforcement priorities rather than actual changes in behaviour – the findings are consistent with previous studies from Scotland and Wales, where no significant post-MUP reductions in drink-driving offences were observed (e.g. Manca *et al*., 2022: Livingston *et al*., 2025).

Second, this paper finds that MUP was associated with a significant increase in alcohol prices from pre- to post-implementation. Alcohol prices increased significantly, and immediately after MUP was implemented in off-trade channels, while there was weak evidence to suggest that prices increased significantly in on-trade channels. These findings were in line with expectations, given that off-trade prices are typically cheaper than on-trade prices and are therefore more likely to be affected by the policy. This finding represents a significant "win" for MUP, indicating that the policy has succeeded in raising the price of cheap, high-strength alcohol – the primary mechanism by which it is intended to reduce harmful drinking.

Third, and most notably, the paper finds no evidence that MUP significantly reduced overall alcohol consumption in Ireland during its first two years. This finding is robust across a range of different model specifications. Using Northern Ireland as a control in a CITS regression, the paper finds no evidence to suggest that either the level or trend in alcohol consumption significantly differed in Ireland relative to Northern Ireland from pre- to post-MUP. A single-group ITS model using only Irish data reached the same conclusion: no significant change in either the trend or immediate level of consumption following MUP.

While these findings are generally negative in terms of the impact of the MUP in Ireland, the results are only representative of a lack of changes in overall consumption and do not provide insight into how drinking patterns may have changed across different subgroups of the population. As one of the central aims of MUP is to reduce the level of harmful drinking, especially among the heaviest drinkers, future research should investigate the policy's impact across the distribution of drinkers – including differences by income, age, and drinking intensity.

Ultimately, this study offers the first robust empirical evaluation of MUP's effects in Ireland and serves as a valuable baseline for future research on the policy's longer-term impacts.

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8. Appendix

Table A1: Yearly Estimates of per Adult Consumption

Year	Northern Ireland Litres per Adult	Ireland Litres per Adult
2018	7.617	10.841
2019	7.519	10.654
2020	7.392	9.963
2021	7.646	9.400
2022	7.634	10.133
2023	7.295	10.075
2024	1.579	1.982

Note: 2024 values are for Q1 only

Table A2: Single-Group ITS

	Dependent variable:
	Litres Per Adult
Time Trend	-0.0001
	(0.023)
Post	-0.170
	(0.389)
Lockdown1	-0.662
	(0.516)
Reopen	0.853
	(0.548)
Unemployment	-0.074
	(0.146)
GDP Growth	-0.067*
	(0.036)
Time:Post	-0.034
	(0.062)
Constant	3.095***
	(0.864)
Observations	25
R^2	0.254
Note:	*p<0.1; **p<0.05; ***p<0.01

Table A3: CITS Models by Alcohol Type

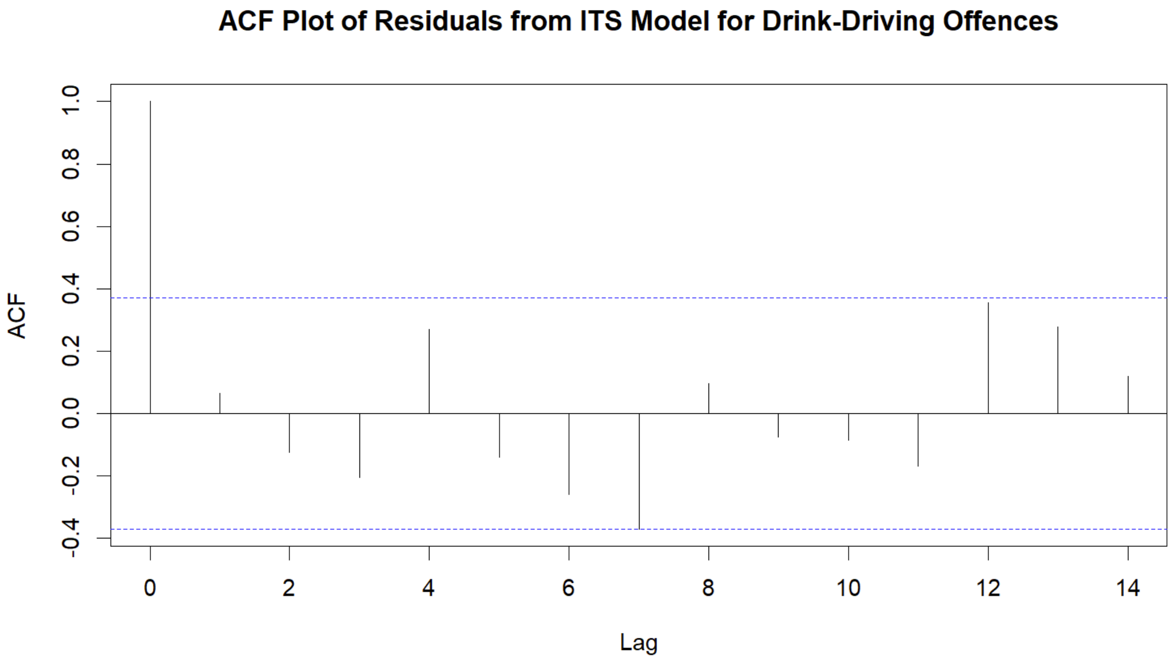
	Dependent variable:			
	Litres Per Adult			
	Beer	Wine	Cider	Spirits
Time Trend (NIR)	0.0001	0.009	-0.002	0.010
	(0.008)	(0.006)	(0.001)	(0.006)
Treatment	0.206*	0.084	0.034*	0.325***
	(0.111)	(0.079)	(0.019)	(0.087)
Post	0.069	-0.031	-0.009	-0.049
	(0.165)	(0.117)	(0.027)	(0.129)
Unemployment	-0.015	-0.0002	0.003	-0.038
	(0.037)	(0.026)	(0.006)	(0.029)
GDP Growth	-0.006	-0.010	-0.001	-0.013*
	(0.009)	(0.006)	(0.002)	(0.007)
Lockdown1	-0.115	-0.067	0.0004	-0.237*
	(0.150)	(0.106)	(0.025)	(0.117)
Reopen	0.154	0.207*	0.021	0.176
	(0.166)	(0.118)	(0.028)	(0.130)
Time:Treatment	-0.015	-0.002	-0.00004	0.002
	(0.011)	(0.008)	(0.002)	(0.009)
Time:Post	-0.009	-0.013	0.004	-0.016
	(0.021)	(0.015)	(0.003)	(0.016)
Treatment:Post	0.035	-0.090	0.022	-0.017
	(0.236)	(0.167)	(0.039)	(0.185)
Time:Treatment:Post	0.020	0.013	-0.004	-0.0003
	(0.029)	(0.021)	(0.005)	(0.023)
Observations	50	50	50	50
R^2	0.513	0.317	0.496	0.619

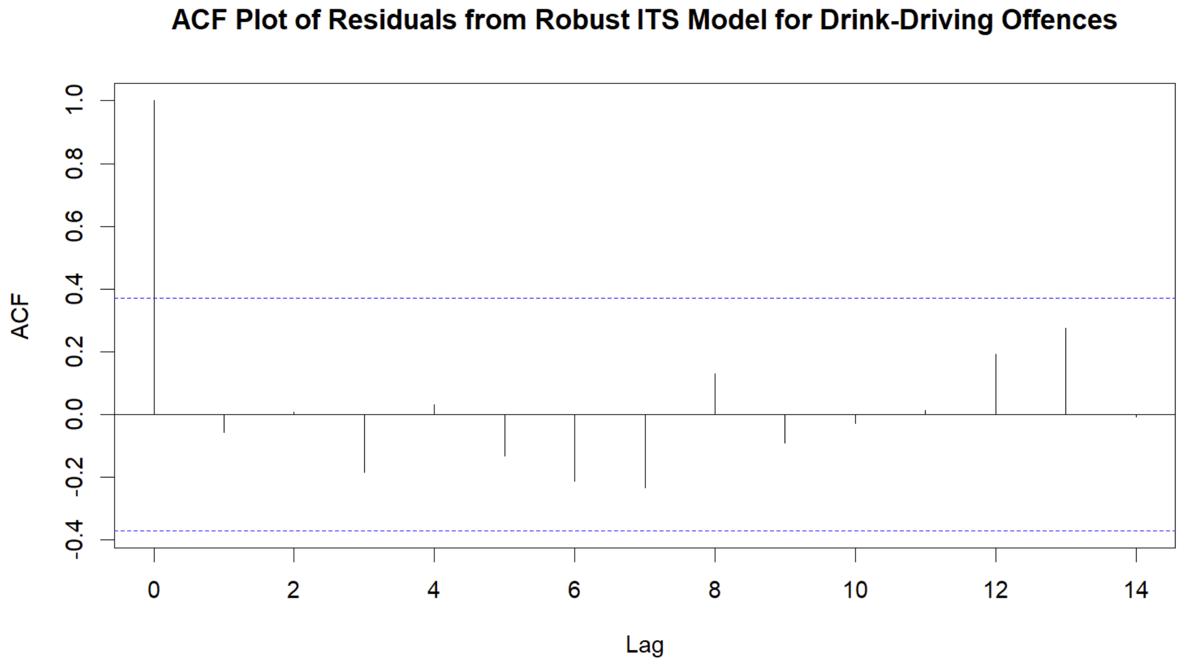
Table A4: Stockpiling Test

	Dependent variable:
	Litres Per Adult
Treatment	0.586
	(0.386)
Time Trend (NIR)	0.004
	(0.016)
Lockdown 1	-0.592
	(0.540)
Reopen	0.908
	(0.633)
Unemployment	0.004
	(0.097)
GDP Growth	-0.040
	(0.027)
Q4 2021 (NIR)	0.305
	(0.381)
Time:Post	-0.015
	(0.052)
Treatment:Time	-0.017
	(0.028)
Treatment:Post	0.031
	(0.352)
Treatment:Q4 2021	-0.034
	(0.580)
Treatment:Reopen	-0.420
	(0.617)
Treatment:Time:Post	0.014
	(0.075)
Constant	1.887^{***}
	(0.358)

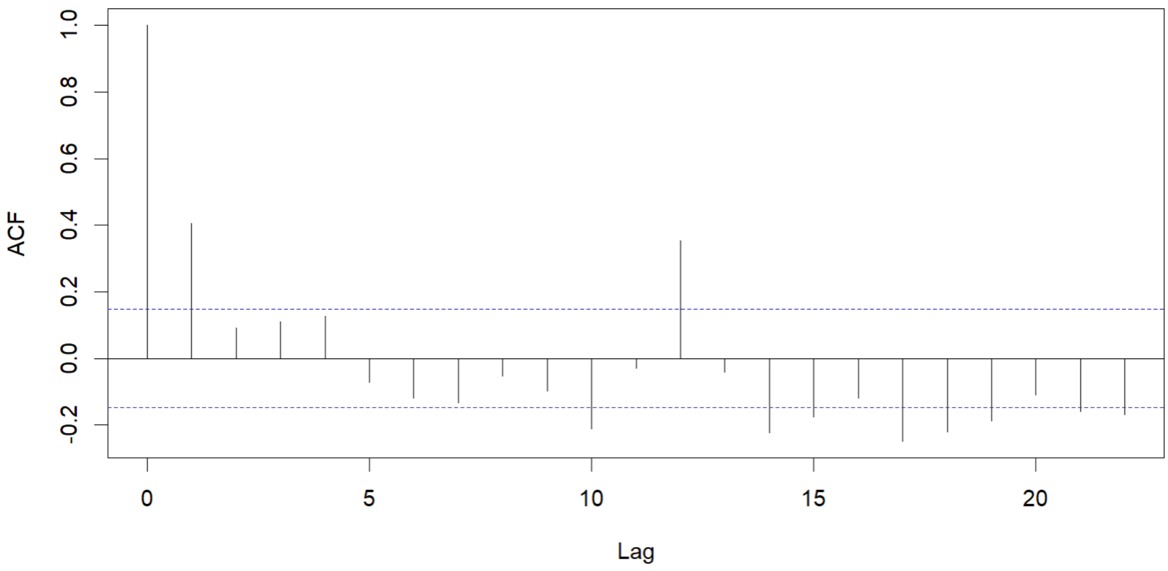
Observations	50
R^2	0.580
Note:	$^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Autocorrelation Checks

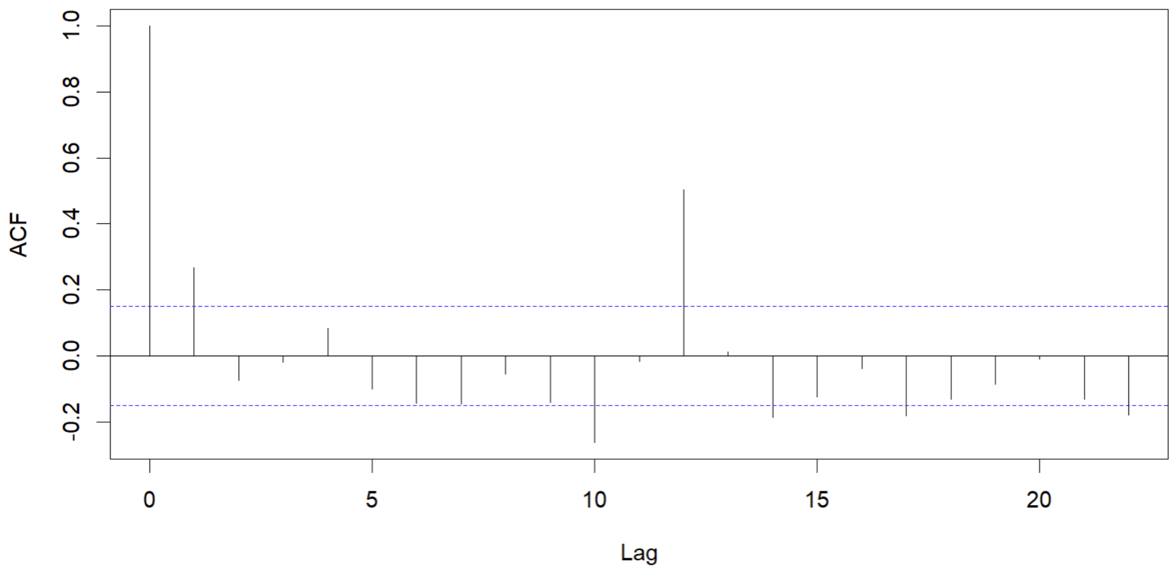




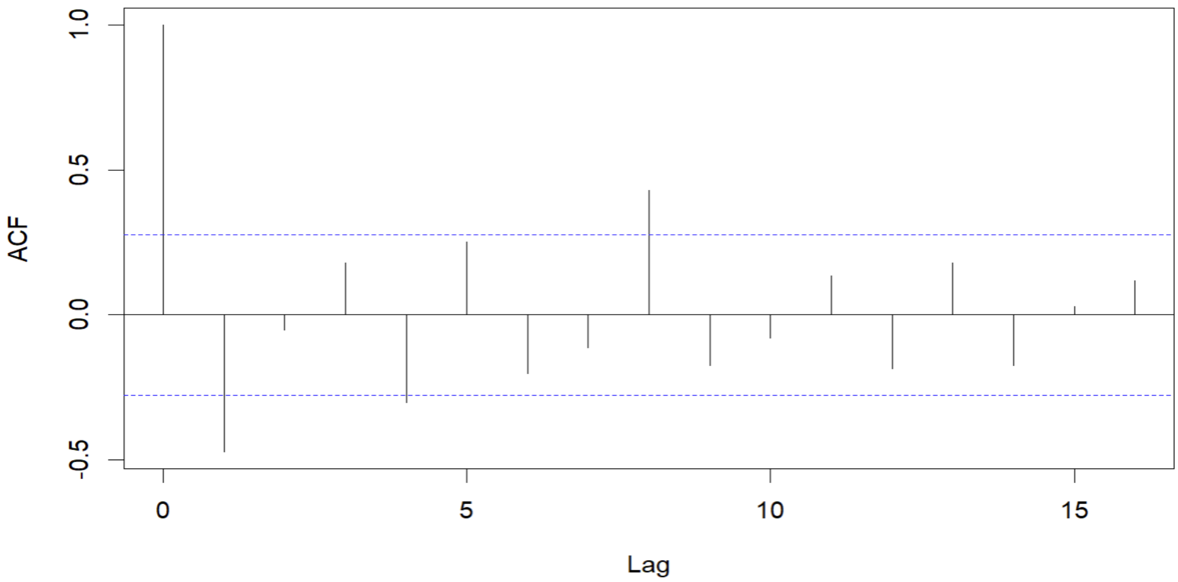
ACF Plot of Residuals from CPI Regression 1



ACF Plot of Residuals from CPI Robustness Check Model



ACF Plot of residuals from Consumption Model with Fixed Effects



ACF Plot of residuals from Consumption Model Without Fixed Effects

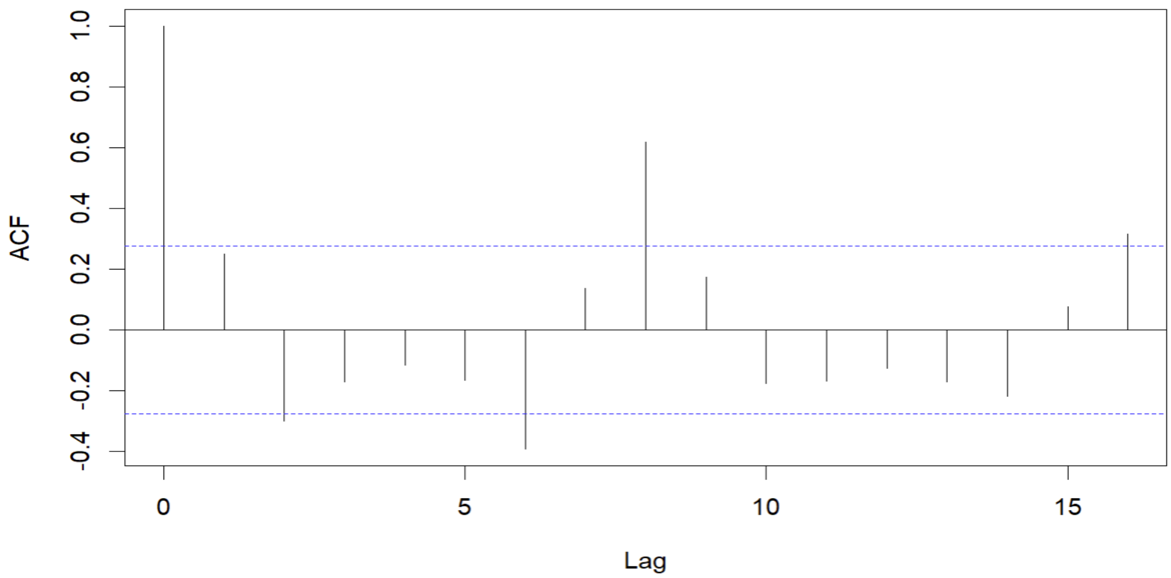


Table A5: Durbin-Watson Tests for Autocorrelation

Model Residuals	DW Statistic	P-Value	Conclusion
Drink Driving Model 1	1.71	0.056	Weak Autocorrelation
Drink Driving Robustness Test	1.758	0.076	Weak Autocorrelation
CPI Model 1	1.18	< 0.01	Significant Autocorrelation
CPI Robustness Test	1.449	< 0.001	Significant Autocorrelation
Consumption Model (Fixed Effects)	2.87	0.652	No Autocorrelation
Consumption Model (No Fixed Effects)	1.457	0.032	Significant Autocorrelation