Working Paper

VAT rate changes and pass-through

Evidence from the Irish hospitality and tourism industry

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Abstract

Value Added Tax (VAT) rate changes are a recurring policy tool used to raise revenue, change behaviour and regulate economic activity. However, the degree to which VAT rate changes are reflected in consumer prices—known as pass-through—varies across industries and time. Understanding VAT pass-through is crucial for evaluating fiscal policies' effectiveness and their economic impact. Yet, little is known about their pass-through in an Irish context. This paper examines the extent to which changes in VAT rates are passed through to consumer prices in the Irish hospitality and tourism sector. Using an event-study approach, I analyse two VAT rate cuts (2011, 2020) and two VAT rate increases (2019, 2023). I find evidence of an asymmetric VAT rate pass-through, with VAT rate increases being passed through more than VAT rate cuts.

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Introduction

Value-Added Tax (VAT) rate changes are a recurring policy tool used to raise revenue, change behaviour and regulate economic activity. In the EU, VAT revenue is one of the largest sources of government revenue, accounting for 27% of tax revenue. Increasingly, VAT rate changes have been used as a tool for active demand management. Over the last 5 years, 22 of the 27 EU Member States cut VAT rates either to stimulate the economy during Covid-19 or to help households as the cost-of-living rose. In most instances these VAT rate changes were temporary and were to the reduced VAT rates—not the standard rate. These changes were often targeted at specific sectors (hospitality and tourism) or specific products (food and energy).

Given the prominence of VAT as a revenue source and its use as a demand management tool, how much of a VAT rate change gets passed onto prices is an important policy question. Understanding VAT pass-through is crucial for evaluating fiscal policies' effectiveness and their economic impact.

Yet, there is no such thing as "the" pass-through rate of VAT (Benedek et al. 2020), with many factors influencing the pass-through rate.[1] Hindriks and Serse (2019) find that pass-through varies based on the intensity of local store level competition—over-shifting is lower in areas with more competition.[2] Markets that allow for more product differentiation can increase pass-through (Bellon and Copestake 2022). This acts through reducing the relative price elasticity of demand. When producers face more competitive markets the tax burden from an increase in VAT falls on consumers (Bellon and Copestake 2022).

VAT rate changes targeted at competitive markets are more likely to be cost effective (Montag, Sagimuldina, and Schnitzer 2020) with higher rates of pass-through (Fuest, Neumeier, and Stöhlker 2024). Furthermore, Hindriks and Serse (2022) argue that salience of the VAT rate change increases pass-through, while regulation may also increase pass-through. There is also evidence that pass-through is greater for changes to the standard rate of VAT than for reduced rates (Benzarti et al. 2020).

[1] Appendix F provides an overview of empirical findings on VAT rate pass-through from some selected studies.
[2] Hindriks and Serse (2019) studied an excise tax change, not a VAT rate change.

Temporary VAT cuts aim to stimulate demand by bringing forward spending (Blundell 2009). Likewise, pre-announced tax rate changes can cause a shift in the timing of consumption in the months both prior to and after implementation (Buettner and Madzharova 2021). Montag, Sagimuldina, and Schnitzer (2020) argue that unconventional fiscal policy (temporary VAT rate changes) can be more cost effective by targeting competitive markets (where consumers are more likely to search for lower prices). In addition, for temporary VAT changes, prices may rise to higher levels upon reversal of the change (Benzarti et al. 2020), as prices respond asymmetrically— pass-through is larger for increases than for cuts. However, Fuest, Neumeier, and Stöhlker (2024) find that even when producers operate in highly competitive markets, they may not fully pass-through reversals of VAT rate cuts.

Yet, little is known about their pass-through in an Irish context. In recent years, VAT rates in Ireland have been used as a tool to stimulate demand and combat the rising cost of living. The most frequently changed VAT rate in recent years has been the rate that has applied to the hospitality and tourism industry. This VAT rate applies to a sector which accounted for approximately 2.2% of national income and 6.7% of employment in 2023, and between 11-15% of household consumption.[3,4] This VAT rate has been used as a temporary stimulus measure and the rate has been changed four times since 2011.

This paper examines the extent to which these VAT rate changes have been passed through to consumer prices in the Irish hospitality and tourism sector. Since the financial crisis, the VAT rate on hospitality and tourism has been used as an active demand management tool by the Irish Government.

On 11th May 2011 the recently elected Irish Government launched a Jobs Initiative aimed at lowering prices and stimulating demand following the financial and sovereign debt crisis. As part of this initiative, the VAT rate on hospitality and tourism was cut from 13.5% to 9% on the 1st July 2011 on a temporary basis. Included under the scope of the measure was accommodation, food and catering services, hairdressing, sports participation, and attractions such as cinemas, theatres and museums.

[3] Figure reflects the GVA of accommodation and food services as a share of modified gross national income (GNI*). The hospitality and tourism VAT rate also applied to other areas such as attractions (cinemas, theatres, museums) and certain sports participation. While the VAT rate did not apply to all of the Arts entrainment and recreation sector, this sector account for a further 0.9% of GNI*.
[4] As measured by the CPI over the period 2011-2023.

The measure was originally set to expire on 31st December 2013 but was subsequently extended in each budget until Budget 2019. The VAT rate on hospitality and tourism reverted back to 13.5% on 1st January 2019. However, following the onset of the Covid-19 pandemic, the Irish Government wished to provide further support to small businesses and in Budget 2021 announced the reintroduction of the 9% VAT rate for hospitality and tourism starting from 1st November 2020. The measure was originally set to expire on 31st December 2021, but was extended a further three times until it was reversed on 1 September 2023.This study uses a difference-in-difference event study approach to estimate the pass-through of the hospitality and tourism VAT rate changes to prices. I construct a counterfactual by comparing price changes in Ireland before and after VAT adjustments to those prices of the same goods and services in the UK. The key assumption is that, without VAT changes, the price trajectories of the treated (Irish hospitality and tourism prices) would be the same as those in the control group (UK hospitality and tourism prices).

Every month in Ireland, the Central Statistics Office (CSO) collects approximately 50,000 quoted prices. These prices are used to construct price indices for 612 representative items of the average household consumption basket that feed into the consumer price index (CPI). Prices are typically collected during the weeks containing the second Tuesday of every month, up to and including the third Tuesday of every month.

The resulting 612 item indices are made public every month. However, these indices are not sufficiently disaggregated and often include many services, some of which may be subject to the VAT change and some of which may not. In most cases the publicly available data is not disaggregated enough to be able accurately to estimate the pass-through of VAT rate changes to prices.

As a result, micro-data is needed for both Ireland and the UK. The ONS published the UK CPI micro data every month, making it freely available to the public. This data is available on the ONS website back as far as 2005.[5] In contrast, the CSO do not publish the Irish CPI micro data, nor do they make it available to researchers. However on request, the CSO has provided the author with several price series from the hospitality and tourism industry.

[5] The data can be found here: https://www.ons.gov.uk/economy/inflationandpriceindices/datasets/consumerpriceindicescpiandretailpricesindexrpiitemindicesandpricequotes.

Using this data, I find that tax rate increases get passed on by between 36% and 88%. The direct impact of the VAT rate increases on inflation ranged from 0.2 percentage points to 0.5 percentage points. While the data is less conclusive on the pass-through of VAT rate cuts, the results suggest that the VAT rate cuts are passed on less than VAT rate increases, by between 0% and 50%, reducing inflation by up to 0.29 percentage points.

Background and Context

Figure 1 shows the main VAT rate changes in Ireland since 2010. Following the financial crisis, as part of the bailout programme, the Irish Government had agreed to increase the standard rate of VAT from 21% to 23%. This was originally meant to happen incrementally in 2013 and 2014, but was brought forward to January 2012. For much of the last 15 years, that is where the standard rate of VAT has remained. However, for a six month period during the Covid-19 pandemic, the Irish Government reduced the standard rate of VAT from 23% to 21%.

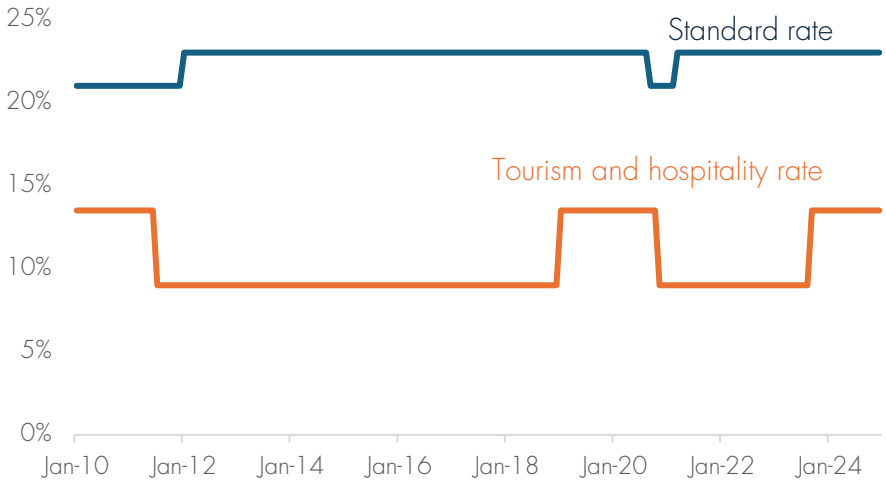
The VAT rate on hospitality and tourism has changed four times over the same period. It was cut twice in 2011 and 2020, and increased twice in 2019 and 2023. Included in the scope of hospitality and tourism for the original VAT rate cut in 2011 were:

- Accommodation (hotels, hostels, B&Bs)
- Food and catering
- Attractions (cinema, theatres, musicals, museums)[6]
- Hairdressing
- Sports participation (gyms etc.)[7]
- Newspapers[8]

It is the tax rate changes to these services that are the focus of the paper. The following sections provide more background and context on each change to the VAT rate on hospitality and tourism.

[6] Theatres and musicals that did not provide alcohol on the premises are not covered by this rate.
[7] Sports facilities remained at the 9% rate in 2019.
[8] Newspapers remained at the 9% rate in 2019. On 1 January 2023, they were subsequently zero rated.

Figure 1: VAT rates in Ireland since 2010



2011 VAT rate cut

On 11 May 2011 the Irish Government announced a "Jobs Initiative" aimed at stimulating the Irish economy following the financial crisis.[9] One of the main measures announced as part of this stimulus was an, at the time, temporary VAT rate reduction for the hospitality and tourism industry from 13.5% to 9%. This took effect from the 1 July 2011 with an expiry date of 31 December 2013.

The VAT rate change was announced at a time when employment was expected to continue to fall throughout the year, and prices were expected to rebound following deflation in 2010.[10] In the UK, these services were liable for the standard rate of VAT, which increased from 17.5% to 20% on 4 January 2011.

[9] See here for the 2011 Jobs Initiative: https://www.socialjustice.ie/system/files/file-uploads/2021-09/2011-05-10-governmentsjobinitiative.pdf.
[10] Ibid.

2019 VAT rate increase

The 9% VAT rate was extended in the 2013 Budget, and maintained in each budget until Budget 2019. At Budget 2019 it was announced that the VAT rate for hospitality and tourism would revert back from 9% to 13.5% on the 1 January 2019. This was justified on the basis of a "decline in competitiveness in the sector" and on evidence suggesting spending in hospitality and tourism spending was more responsive to income dynamics than price changes (including VAT) given its discretionary nature ("Review of the 9 Percent VAT Rate" 2018).[11]

However, the VAT rate on newspapers and sports facilities remained at the 9% rate. The UK VAT rate on hospitality and tourism remained at 20% over this period.

At the same time as the VAT rate was increased, the minimum wage was also increased from €9.55 to €9.80 per hour, a 2.6% increase. This poses challenges for identification of the VAT rate pass-through. How this is overcome is discussed further in Section 5.2 and Appendix E.

2020 VAT rate cut

The first cases of Covid-19 arrived in Ireland and the UK in January and February 2020. The arrival of Covid-19 had enormous effects on society and the economy. For larger parts of 2020-2022 many businesses were forced to temporarily close to limit the spread of the virus. This included many services that occurred face to face—particularly those in the hospitality and tourism sector.

In July 2020, the Irish Government announced its "July Stimulus" aimed at supporting business and maintaining consumer confidence.[12] As part of the stimulus, the Irish Government reduced the standard rate of VAT from 23% to 21% on a temporary basis starting on the 1st September 2020 and ending on 28 February 2021. Then in Budget 2021 it was announced that, in response to "unprecedented challenges" facing the hospitality and tourism industry the VAT rate would again be cut from 13.5% to 9% from the 1 November 2020.[13] This was initially announced

[11] https://www.gov.ie/pdf/?file=https://assets.gov.ie/180592/1f2cc869-4edd-4413-b63f-ed4cdb8574ee.pdf#page=null.
[12] See here for the "July Stimulus": https://www.gov.ie/pdf/?file=https://assets.gov.ie/81556/d4fa4cc4-7e9f-4431-8540-a9ecb7126505.pdf#page=null.
[13] See Minister Donohoe's Budget 2021 speech: https://www.gov.ie/pdf/?file=https://assets.gov.ie/90857/d02ff2bb-146a-489b-ae78-99ab18f09378.pdf#page=null.

as a temporary measure which would be in place until 31 December 2021.

On 8 July 2020, the UK Government announced a VAT rate cut for the hospitality and tourism industry from 20% to 5% which would commence on 15 July 2020. Given, this VAT rate change occurred mid-way through the month of July this may have shown up in UK CPI in either July or August. The ONS usually collects prices on the 2nd or 3rd Tuesday of every month. In July 2020, this was the 14th or the 21st July. As a result, the prices of some products may have been collected prior to the VAT rate change, in which case the impact on CPI for these products would show up in August. In addition, even if prices were collected after the VAT rate change was implemented, we cannot rule out that the VAT rate changes could take a number of months to fully pass-through.

For this reason, in the results below, the event study window for the VAT rate cut for 2020 starts in September 2020, two months prior to the implementation of the VAT rate cut in Ireland.

Covid-19 also hampered data collection efforts by both statistical agencies in the UK, and Ireland. As businesses were forced to close, many services—particularly face to face services—no longer had quotable prices that could be included in the calculations for the consumer price indices. The only hospitality and tourism prices collected on a consistent basis in both the UK and Ireland over the period July 2020 to April 2021, were those for takeaway food and drink items. Due to lockdowns imposed in both Ireland and the UK, while the prices for other items in the hospitality and tourism sector were collected in December 2020, they were not collected in the month of November 2020 and January to April 2021. This means there is only one post-treatment data point (December 2020) for these prices.

2023 VAT rate increase

The temporary VAT rate cut was initially extended three times: from 31 December 2021 to 31 August 2022; then until the 28 February 2023; and finally, it was extended until 31 August 2023, at which point it reverted back from 9% to 13.5%.[14] This occurred at a time of high inflation, with CPI in Ireland rising by 6.3% y/y in August 2023.

The VAT rate on hospitality and tourism in the UK returned to 20% from 1 April 2022, well before the event study window.

Data

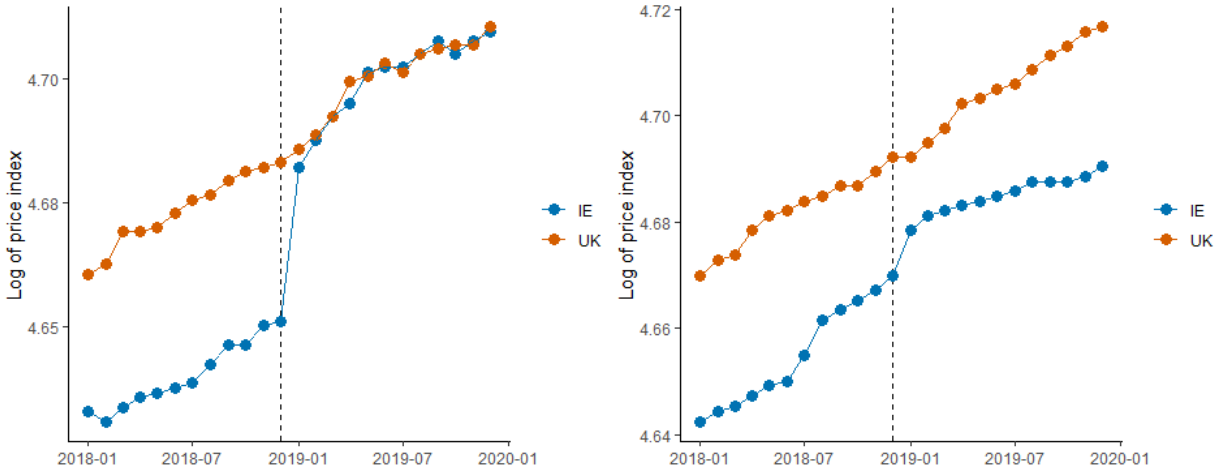
This study uses the UK as a counterfactual by comparing prices in Ireland before and after VAT rate changes to those in the UK. The key assumption is that, in the absence of the VAT rate changes, the price trajectories of the treated group (Irish hospitality and tourism prices) would be the same as those in the control group (UK hospitality and tourism prices). This assumption is more likely to hold over shorter time periods than longer time periods.

The most disaggregated publicly available consumer price data is the 5-digit COICOP level data.[15] This data is only available post 2017 for both countries. By way of example, Figure 2 (a) shows the most disaggregated publicly available data for prices of women's hairdressing in the UK and Ireland in the 12 months before and after a VAT rate increase on hairdressing in Ireland on the 1st January 2019.[16]

A number of observations are striking about this figure. Both the hairdressing prices of the treated (Ireland) and the control (UK) group follow similar trends over time. Prices in Ireland run parallel to those in the UK prior to treatment. Immediately post VAT rate increase, there is a clear jump in prices of the Irish prices (treated) after implementation. Thereafter, Irish prices continue in tandem with UK prices. This figure also provides visual evidence that the prices in the UK can be a useful control group for those in Ireland.

[14] This final extension was announced on 21 February 2023.
[15] COICOP, the Classification of individual consumption by purpose, is the international standard for classifying household consumption expenditure. It includes categories such as food, clothing and footwear, housing, and recreational expenditure. For further information, see here: https://unstats.un.org/unsd/classifications/Econ/Download/COICOP_2018_pre_copy_edit_publication.pdf.
[16] This data is from Eurostat, but is also available from the CSO and the ONS. The series shown are from COICOP code CP12112 and CP11111 with Base 2015 = 100.

Figure 2: Price trends around the 2019 VAT rate increase from 9% to 13.5%



(a) CP12112: Hairdressing prices (women). *(b) CP11111: Restaurants, cafes and the like.*

Unfortunately, however, the 5-digit COICOP data is also not disaggregated enough. Figure 2 (b) shows the prices index in Ireland and the UK for restaurants, cafes and the like (CP11111), over 2018 and 2019. While it is clear from the chart that there is an increase in prices around the time of the VAT rate increase at the start of January 2019, this increase is small relative to that for women's hairdressing prices. This may suggest a lower pass-through rate for these services relative to hairdressing.

However, using this data to estimate the level of pass-through would result in a downward bias in the estimate of the pass-through and could mistakenly lead one to believe that the pass-through was lower for restaurant and cafe prices. This bias is due to the fact that the index for CP1111 includes goods and services which are unaffected by the VAT rate change. It includes alcohol purchased in licensed premises, which is subject to the standard rate of VAT, and not the reduced rate of VAT that food and catering are subject to.

For this reason, more disaggregated microdata is required. To that end, I use publicly available Consumer Price Index (CPI) microdata from the UK Office for National Statistics (ONS). For the Irish data, no microdata file exists. However, several series of prices from the relevant sectors were

provided on request by the CSO. The list of services included in the analysis is shown in Appendix A.[17]

Empirical Approach

The aim of the paper is to estimate the causal impact of a change in VAT on prices in the Irish hospitality and tourism industry. In order to identify a casual effect, an appropriate counterfactual is required.

The approach used here to construct a counterfactual is to compare the prices of goods and services in Ireland before and after VAT rate changes to those prices of the same goods and services in the UK. The key identifying assumption needed for this counterfactual to hold is that parallel trends hold: in the absence of the VAT rate changes, the price of the good in Ireland would have followed the same trajectory as that of the same good in the UK. This assumption is more likely to hold over shorter time period than longer time periods.

The UK hospitality and tourism sector is relatively similar to the Irish hospitality and tourism sector. The close geographical proximity means they share similar climates. Culturally, they share similarities and both countries are native English speakers making both countries attractive to the same type of tourists. In terms of economic activity, they are also broadly similar. Between 2010 and 2019, the average share of GVA accounted for by accommodation and food in the UK was remarkably similar to the share of accommodation and food in Irish national income (2.75% vs 2.73%).[18] Wages in the accommodation and food sector made up 4% of total wages in Ireland and 3.5% in the UK. Over the period 2010-2023, the accommodation and food sector accounted for 6.9% of total employment. The corresponding figure for the UK was 5.2%. In the UK, consumption in the hospitality and tourism industry accounts for between 15-20% of the consumption basket. In Ireland, the range was between 11-15%. Taken together, these suggest that the UK hospitality and tourism industry could act as reasonable counterfactual for the Irish hospitality and tourism industry.

I employ a difference-in-difference event study strategy and estimate the following equation over a 12 month window, 6 months prior to the

[17] Irish hotel prices show a strong seasonal pattern that is not evident in the UK data. For this reason, Irish hotel prices are seasonally adjusted using Tramoseats. No other prices are seasonally adjusted. The results with hotel prices excluded are shown in Appendix D.
[18] Modified gross national income is used here instead of GVA due to the well known distortions to Irish GVA statistics.

implementation of a VAT rate change and 6 months post change. To do so, I estimate the following equation:

$$p_{i,m} = \sum_{j \in \{-6,\ldots,6\}} \beta_j \times D_{i,m-j} + \mu_i + t_m + COICOP4_i + C_c + \epsilon_{i,m} \qquad (1)$$

where $p_{i,m}$ is the natural logarithm of the price index for service i in month m. $D_{i,m}^{j}$ is the treatment indicator, μ_i is the service fixed effect, t_m is a month fixed effect which is interacted with the COICOP product class which captures category specific time trends and C_c is the country fixed effect. The event-study coefficients are the β_j's with the coefficient for the period immediately prior to treatment, β_{-1}, normalised to zero. The coefficients show the log-difference, and therefore approximate the growth in prices relative to the period t_{-1}. The results are weighted based on their individual CPI weights. [19]

The most crucial identifying assumption in this set-up is that of parallel trends—in the absence of treatment the prices in the treatment group would follow the same trends of those in the control group. This assumption is not directly testable as we do not directly observe the counterfactual—the post treatment price of the treated group in the absence of treatment. However, one indication that this is a reasonable assumption is the absence of any statistically different trends prior to treatment. This is assessed based on visual inspection of the event study figures.

Where possible, I use a six month window before and after the VAT rate change. Using a longer period would mean the main identifying assumption–that prices for services in Ireland would have the same trends as the prices for the same goods in the UK–is less likely to hold. However, the trade-off of using this shorter time period is that it may not fully pick up the long-term impact of the VAT rate change–pass-through may increase over time, or alternatively may fall over time.

Another important assumption is the Stable Unit Treatment Value Assumption (SUTVA). This assumption requires that there is no spillover between treatment group and control group. Given the nature of the services investigated here, this is unlikely to be an issue. For instance, it is unlikely that in response to a VAT rate change on the price of haircuts or meals in restaurants in Ireland, that restaurants and hairdressers in the England, Scotland or Wales would adjust their prices. While there may be an argument that restaurants or hairdressers in Northern Ireland could

[19] That is, if 20% of expenditure on hospitality and tourism is spent on main courses on restaurants, then when constructing an aggregate pass-through rate, the pass-through on main course prices in restaurants is given a 20% weight.

potentially change their prices in response to a VAT rate change in Ireland, given the size of Northern Ireland relative to the rest of the UK, this is unlikely to have a meaningful impact on aggregate UK prices.

Estimating a true causal parameter also requires there to be no anticipation effects. This is likely to be more of an issue for VAT rate increases than for decreases. For the 2020 VAT rate cut, there was less than a 3 week lead in time between announcement and implementation. For the 2011 VAT rate cut, there was a 7 week lead in time.

For the 2019 VAT rate increase, there was a two and a half month lead in time. This long lead in time may have led businesses to adapt or pre-emptively pass-through prices. Indeed there is some evidence of this in the raw data.[20] Estimated pass-through rates may be an underestimate of the true pass-through rate as a result. For the 2023 VAT rate increase, there was more than 6 months lead in time. However, in this instance, there was significant uncertainty about the credibility of this announcement, right up until implementation. Prior to the announcement in February 2023, the VAT rate had been due to revert back to 13.5% multiple times previously but had been extended, often at the 11th hour.

For a VAT rate increase from 9% to 13.5%, full pass-through would result in a 4.1% increase in the price of that good or service, while for a cut from 13.5% to 9%, full pass-through would result in a price cut of 4%.[21]

[20] Takeaway prices appeared to increase significantly in December 2018, one month prior to implementation.

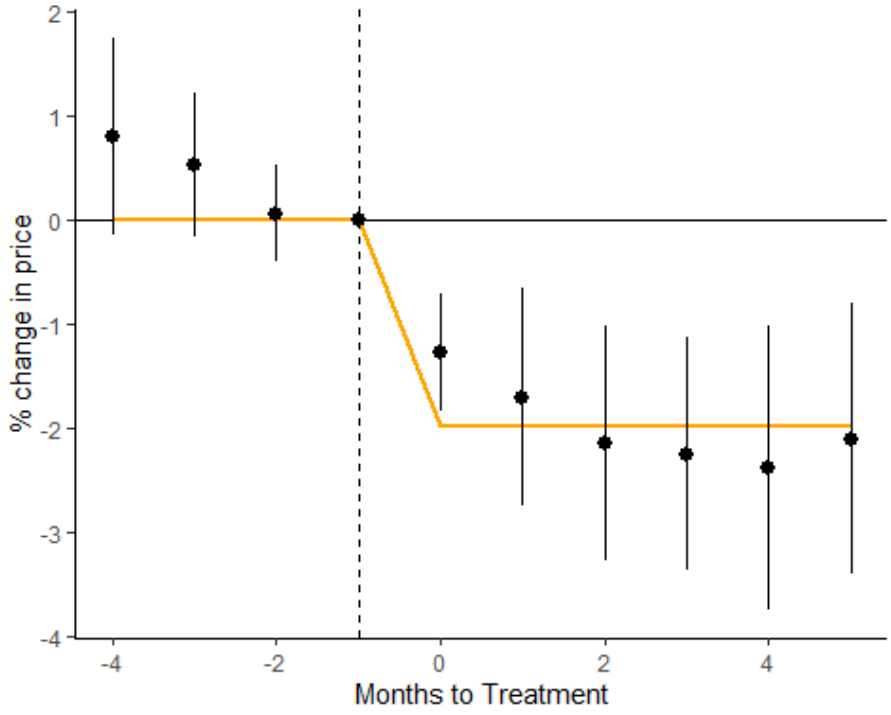
[21] This is because for an increase we have: $\frac{1.135-1.09}{1.09} = \mathbf{0.0413}$, or 4.13%. While for a decrease, we have: $\frac{1.09-1.135}{1.135} = \mathbf{-0.0396}$ or -3.96%.

Results

2011 VAT rate cut from 13.5% to 9%

Turning to the results, Figure 3 shows the event dummy coefficients, as well as 95% confidence intervals, estimated using Equation 1 for the VAT rate cut on 1 July 2011. The UK increased their VAT rate on these products by 2.5 percentage points in January 2011, 6 months prior to treatment. As a result, in this case, I limit the pre-treatment period to 4 months prior to treatment, and assume that whatever pass-through that occurred for the UK VAT rate change was completed after two months.

Figure 3: Impact of 2011 VAT rate cut on hospitality and tourism prices



Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

While none of the point event dummy coefficients prior to treatment are statistically significant, there does appear to be a downward trend between 4 months prior to treatment and 2 months prior to treatment. However, this trend appears to stop and there is essentially no difference in the point estimate for 2 months prior to treatment and 1 month prior to treatment.

Given that, the results indicate that the VAT rate cut from 13.5% to 9% lead to a fall in prices of 1.3% immediately on implementation. This fall in prices continued in the months after treatment, resulting in an aggregate fall in prices of 2% (the yellow line). This represents a pass-through rate of 50%. Overall the direct impact of this VAT rate cut on inflation was to reduce inflation by -0.29 percentage points.[22]

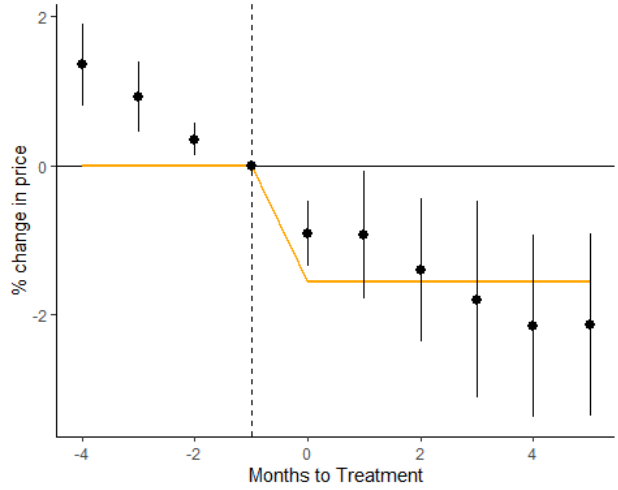
These results are broadly similar to earlier studies that attempted to look at the pass-through of the 2011 hospitality and tourism VAT rate cut to prices (O'Connor 2012; Deloitte 2013, 2014; Indecon 2017). However, given the identification approach used in these studies, it would be difficult to describe their estimated results as causal estimates. Appendix C discusses these studies in more detail.

Next I investigate whether there is heterogeneous pass-through rates with the hospitality and tourism sector. I focus on the food and catering, and hairdressing. Figure 4 (a) shows the estimates for food and catering. In this instance there are clear pre-trends. This makes it difficult to draw any causal conclusions. The same appears to be the case for hairdressing in Figure 4 (b). Hairdressing prices at the time in Ireland showed a seasonal pattern, with the last event study coefficient in Figure 4 (b) being impacted by this seasonality (O'Connor 2012).[23]

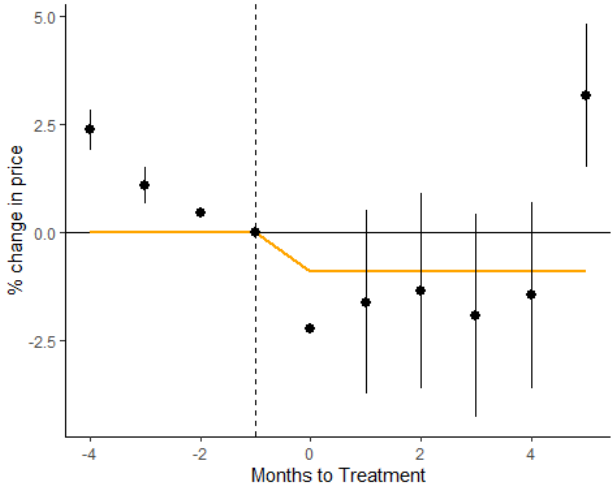
[22] This calculation is based on the 2011 CPI basket weights and does not take into account the indirect effect of households changing their consumption patterns in response to the VAT rate cut, nor does it account for the VAT rate cut potentially leading to changes in prices of other goods and services.

[23] This seasonal pattern has dissipated over time and is not evident for the later VAT rate changes.

Figure 4: Impact of 2011 VAT rate cut on hospitality and tourism prices



(a) Impact on food and catering prices



(b) Impact on hairdressing prices

Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

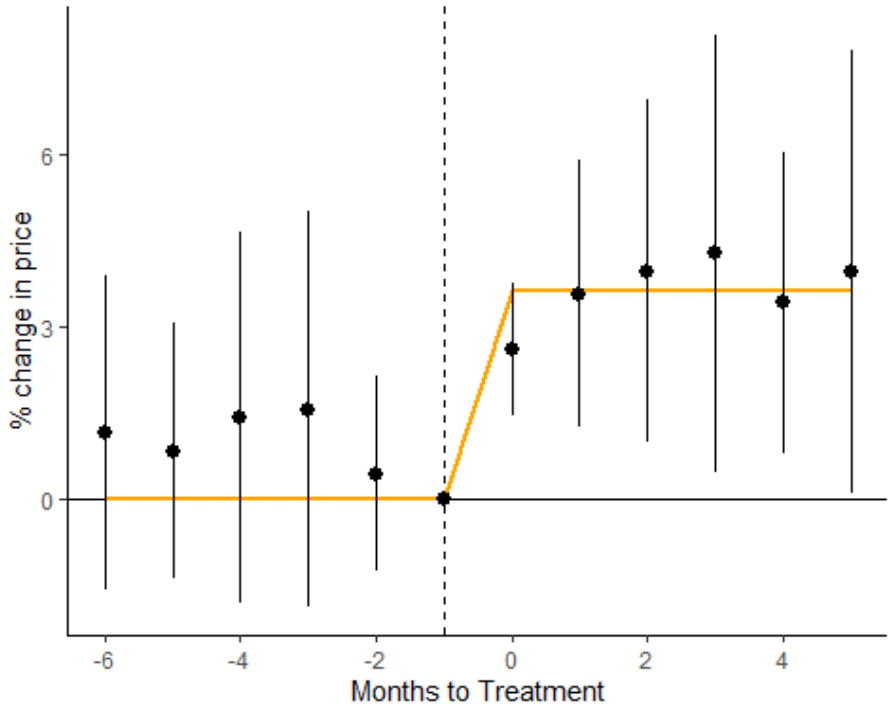
2019 VAT rate increase from 9% to 13.5%

Figure 5 shows the impact on prices in hospitality and tourism from the VAT rate increase from 9% to 13.5% on the 1 January 2019. Immediately following implementation of the VAT rate change, prices in hospitality and tourism rose by 2.6%. Prices continued to rise slightly in the months following the VAT rate increase, with the aggregate effect of the VAT rate change estimated to be 3.6%.

However, on 1 January 2019, the minimum wage in Ireland also increased from €9.55 to €9.80, a 2.6% increase. It is possible that part of the observed increase in prices was due to this minimum wage increase. This possibility is explored in Appendix E. As discussed in Appendix E, the minimum wage increase would at most, lead to a 1% increase in these prices.[24] As a result, at the very least, the VAT rate change resulted in a 2.6% (3.6%-1%) increase in prices. However, using the same approach to assess the pass-through of VAT rate increase in prices, an analysis of the pass-through rate of minimum wage changes to prices in the years before and after 2019 (2016, 2017, 2018, and 2020), suggests that minimum wage changes are not passed-through to prices in the hospitality and tourism sector (See Appendix E). This suggests that the full 3.6% increase in prices can be attributed to the VAT rate change.

[24] Assuming a 100% pass-through and all wages being impacted by the minimum wage changes.

Figure 5: Impact of 2019 VAT rate increase on hospitality and tourism prices

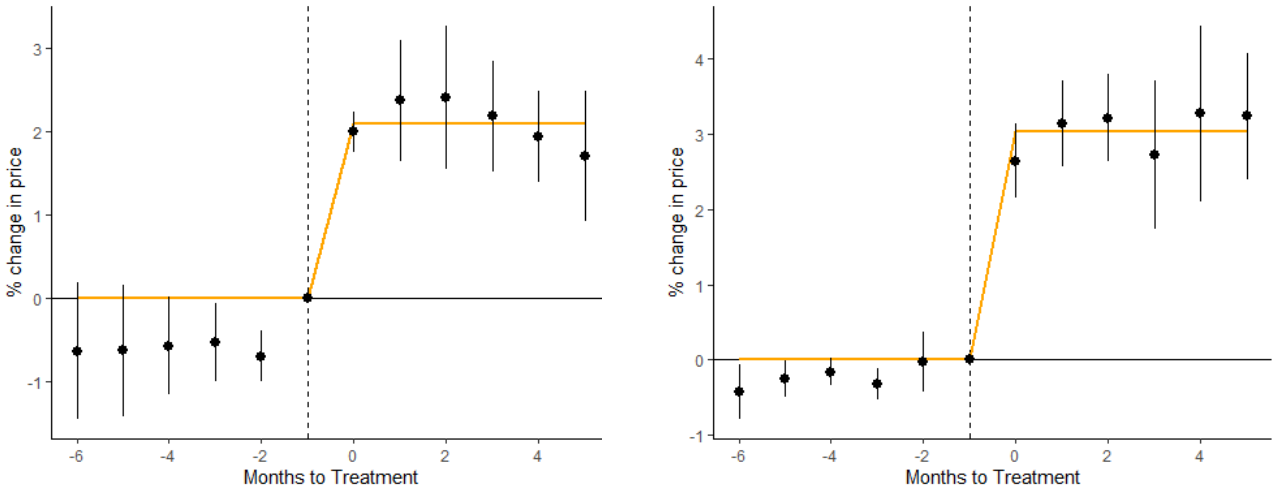


Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

Looking at food and catering in Figure 6 (a), I find an immediate increase in prices of 2%. The average price increase in the post treatment period is also estimated at 2.1%, implying a pass-through rate of 51%.

For hairdressing services, the pass-through appears stronger, with prices increasing by 2.6% immediately following the VAT rate increase (Figure 6 (b)). The aggregate post-treatment effect is estimated to be 3%. In this case, pass-through is estimated to be 74%.

Figure 6: 2019 VAT rate increase from 9% to 13.5%



(a) Impact on food and catering prices *(b) Impact on hairdressing prices*

Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

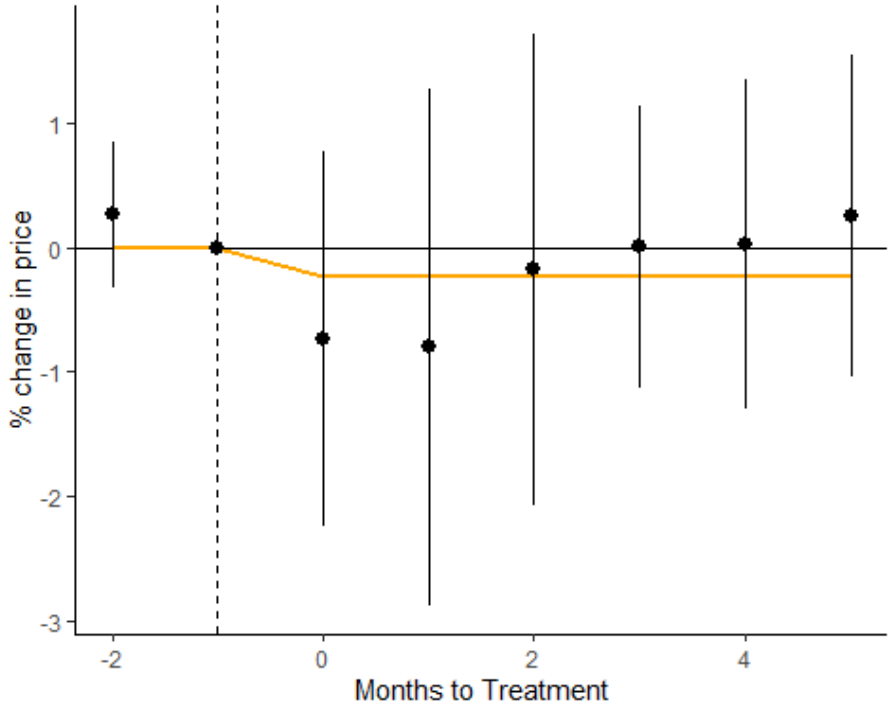
2020 VAT rate cut from13.5% to 9%

As discussed in Section 2.3, Covid-19 hampered the collection of consumer price data in Ireland and the UK. Many business were forced to temporarily shut to prevent the spread of the virus. This led to no transactions for certain services and as a result no prices for these services in certain months. Of the services which were under the hospitality and tourism VAT rate, only the prices of takeaway food and drinks were collected for each month from July 2020 to April 2021.

Figure 7 shows the event study coefficients for takeaway food and drink in the months before and after the November 2020 VAT rate change on hospitality and tourism. Given the VAT rate change on similar services in the UK in July 2020, there are only two pre-treatment periods.[25] For this reason, these results are based on the assumption that whatever pass-through took place for the UK VAT rate change, was fully complete by August 2020.

[25] As mentioned above, given the price collection periods by the ONS, the estimation window starts in September rather than August. This estimation also relies on the assumption that the UK VAT rate change was fully passed through by August.

Figure 7: Impact of 2020 VAT rate cut on takeaway prices



Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

The results suggest that there was limited-to-no pass-through of the VAT rate cut to takeaway prices—the event study coefficient estimates are not statistically different from zero.

However, while prices were not available for every month between July 2020 and April 2021 for all services, prices were available prior to treatment and, for one post treatment month, December 2020, the second month following treatment.

Using this post treatment data, Table 1 shows difference-in-difference estimates of the change in prices from the VAT rate cut to hospitality and tourism services in November 2020. Similarly, to the estimates for takeaway prices, these results suggest that there was little to no pass-through of the VAT rate cut in November 2020.

Table 1: Difference-in-difference estimate: Impact of 2020 VAT rate cut on prices

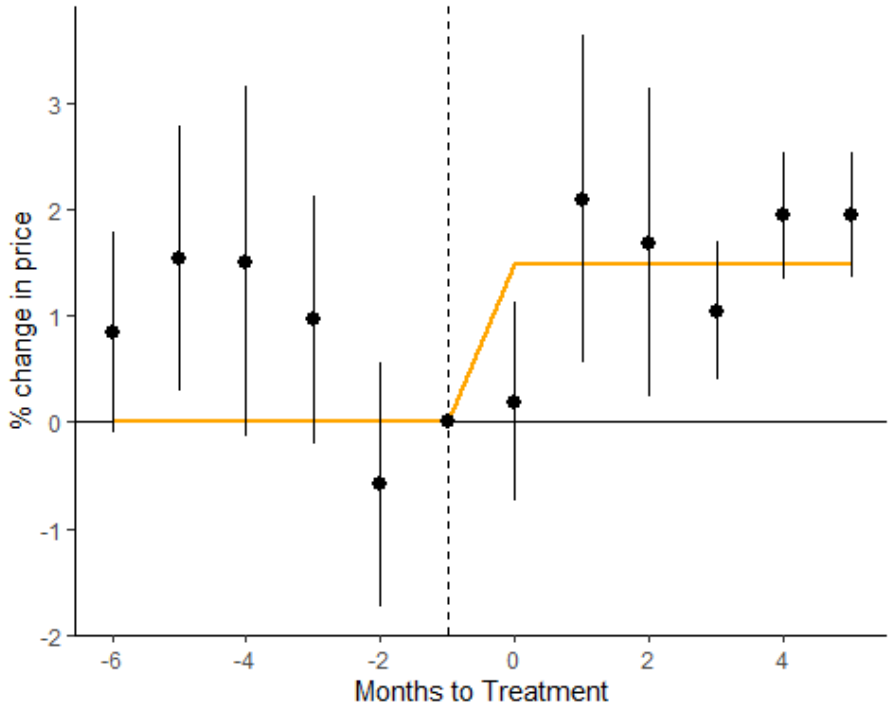
	% price change
Variables	
VAT rate cut	-0.85
	(7.58)
Fixed effects	72.6
Unit	Yes
Time	Yes
Fit statistics	
Observations	72
R-squared	0.38

Notes: Clustered standard errors in parentheses.

2023 VAT rate cut increase from 9% to 13.5%

Figure 8 shows the impact of the VAT rate increase on hospitality and tourism prices on 31 August 2023. There appears to be very little pass-through initially in September 2023, with prices only increasing by 0.2%. However, pass-through appears to have increased in October 2023, with prices increasing by 2.1%. This delayed pass-through may be a result of businesses wanting to wait until after the very end of the summer tourist season before increasing prices.

Figure 8: Impact of 2023 VAT rate increase hospitality and tourism prices

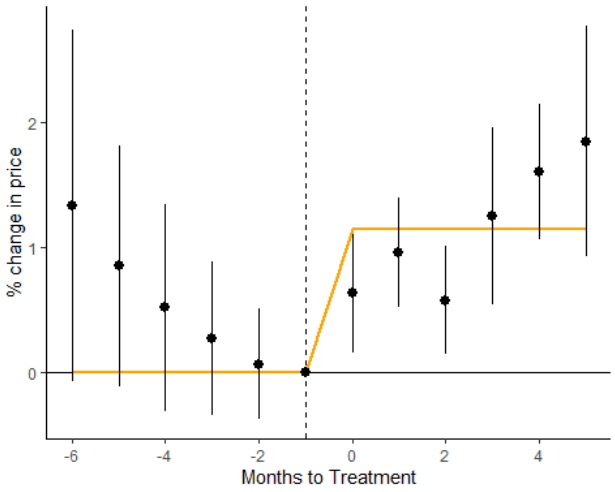


Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

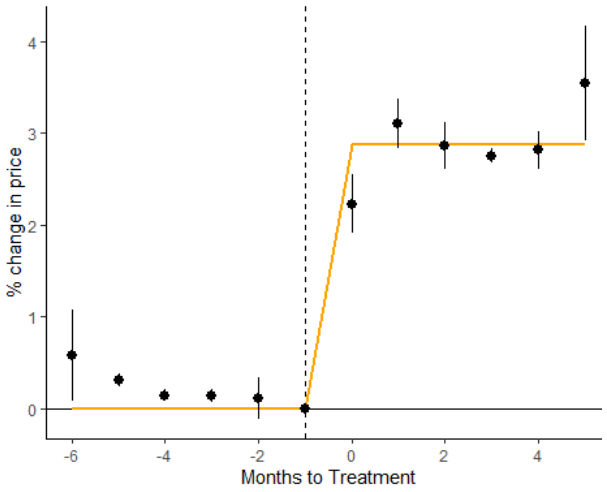
This appears to be the case when looking at Figure 9. Pass-through was more immediate for hairdressing services (Figure 9 (a)) with prices increasing by 2.2%, than for food and catering, with prices increasing by only 0.6%.[26] Overall, there appears to be a stronger pass-through for hairdressing services with a pass-through of 70%, relative to a pass-through of 28% for food and catering.

[26] The pass-through in the first month for food and catering was not statistically significant.

Figure 9: 2023 VAT rate increase from 9% to 13.5%



(a) Impact on food and catering prices



(b) Impact on hairdressing prices

Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

Discussion

Table 2 shows a summary of the results of pass-through based on the four VAT rate changes to hospitality and tourism prices. What is clear from the results is that there is no single pass-through rate. Instead, the results are very much context specific.

The results suggest that, on average, pass-through rates are larger for VAT rate increases than for VAT rate cuts. This has important policy implications. If the hospitality and tourism VAT rate is used as a temporary stimulus or cost of living measure (a cut followed by a reversal), it may ultimately result in a price level that is higher than would otherwise be the case, as the increase would be passed-through more than the original cut. Benzarti et al. (2020) had similar findings when looking at the January 2007 cut and January 2012 increase in VAT rate on hairdressing prices in Finland.

In all cases, the overall direct impact of VAT rate changes for hospitality and tourism on inflation is relatively small, at less than half a percentage point. Pass-through was low for VAT rate cuts, indicating that a change to this particular VAT rate may not be useful in addressing a cost of living crisis. That being said, it could potentially be used to combat deflation, in combination with changes to other goods and services.

The analysis highlights variations in pass-through rates across subcategories within the hospitality and tourism sector, such as catering and hairdressing. The pass-through rates appear lower for food and catering than for hairdressing. The results for pass-through of cuts are broadly similar to those found in other countries such as France, with Benzarti and Carloni (2019) finding little pass-through to prices for VAT rate cuts to restaurants, and Spain with Moral-Arce and Gomez-Antonio (2020) finding similarly low pass-through for cuts to cultural services. The findings on pass-through of VAT cuts for hairdressing services were broadly similar to those of Kosonen (2015) and Benzarti et al. (2020).

Table 2: Summary of results of impact on hospitality and tourism prices from VAT rate changes

	VAT rate change	Impact on prices	Pass-through to prices	Direct impact on inflation
2011	−4.5pp	-2%	50%	−0.3pp
2019	+4.5pp	3.6%	88%	0.5pp
2020	−4.5pp	-0.2%	6%	0pp
2023	+4.5pp	1.5%	36%	0.2pp

Notes: Figures for 2020 refer to takeaway prices only.

Conclusion

VAT rates have played a crucial role in active fiscal policy in recent years. What has become known as unconventional fiscal policy—temporary VAT rate changes to stimulate the economy—has become more prominent. The effectiveness of these policies and their impact on the macroeconomy are important policy questions.

In Ireland, the VAT rate on hospitality and tourism has become a key demand management tool in recent years. It is also an expensive measure. As of 2025, reducing the VAT rate from 13.5% to 9% would cost €0.87 billion for a full-year (0.27% of national income), equivalent to cost of increasing the standard rate income tax bands by €3,000, hiring 11,400 nurses or 7,800 teachers. As a result, it is important that policymakers are informed about the impacts that these policy changes have on the macroeconomy.

This study examines the extent of VAT pass-through in the Irish hospitality and tourism industry by analysing four major VAT rate changes between 2011 and 2023. Using an event study approach, the findings indicate that the degree of pass-through varies significantly depending on the direction of the VAT change and the broader economic context. The 2011 VAT reduction led to a 50% pass-through to consumer prices, while the 2019 VAT increase resulted in an 88% pass-through. More recent VAT changes, particularly in 2020 and 2023, showed lower levels of pass-through, influenced by external factors such as the COVID-19 pandemic, economic uncertainty and a high inflationary environment.

These results also suggest that businesses in the hospitality and tourism sector may respond asymmetrically to VAT rate increases versus decreases, with higher pass-through for tax hikes. This is likely to lead to a higher overall price level from a temporary change in this VAT rate. Additionally, the findings highlight the importance of considering market conditions and external shocks when evaluating VAT policy effectiveness. Policymakers should account for these factors when designing future tax changes to ensure their intended macroeconomic effects, including those on prices and consumer spending are achieved.

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Appendix A: List of products

Table 3 lists the services from the consumer price index basket which are included in the analysis.

Table 3: List of services included in the analysis.

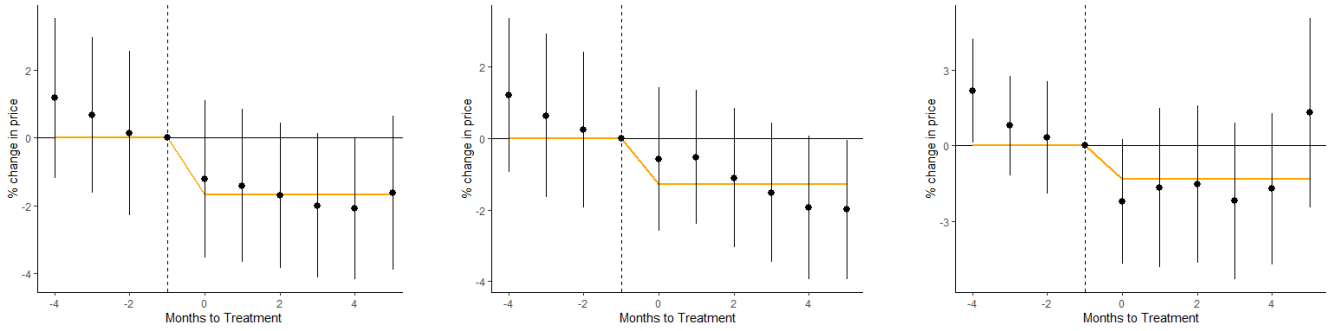
Irish CPI label	UK CPI label
Pub Hot Meal	Pub Hot meal
Restaurant Main Course	Restaurant main course 1
Restaurant cup of coffee	Restaurant - cup of coffee
Cakes/pastries - Eat In	Restaurant - sweet course
Sandwich/wrap - Eat In	Restaurant sandwich
Coffee/Tea Take Away	Coffee - Takeaway
Pastry/pie Take Away	Pasty/savoury Pie - Takeaway
Take aways, Asian Meals	Chinese Takeaway
Burger in Bun Take Away	Burger in Bun- Takeaway
Man's Haircut	Man's haircut
Women's Cut/Blow-dry	Women's Hairdressing-cut/blow-dry
Women's Highlights	Women's Highlighting
Hotel	Hotel 1 Night price
Nightclubs*	Nightclub Entry Saturday*
Newspapers*	National Daily newspapers*

*Note: These items were only included in the 2011 estimation. Nightclub prices dropped out of the CPI basket so prices were not collected, while Newspapers were not subject to the VAT rate changes in 2019, 2020 or 2023.

Appendix B: Un-weighted results

The results in the main text are weighted by the proportion of expenditure spent on each service. That is, they are weighted by each products basket weight in the consumer price index. This appendix provides the unweighted results of the estimating equation 1 for each of the four VAT rate changes.

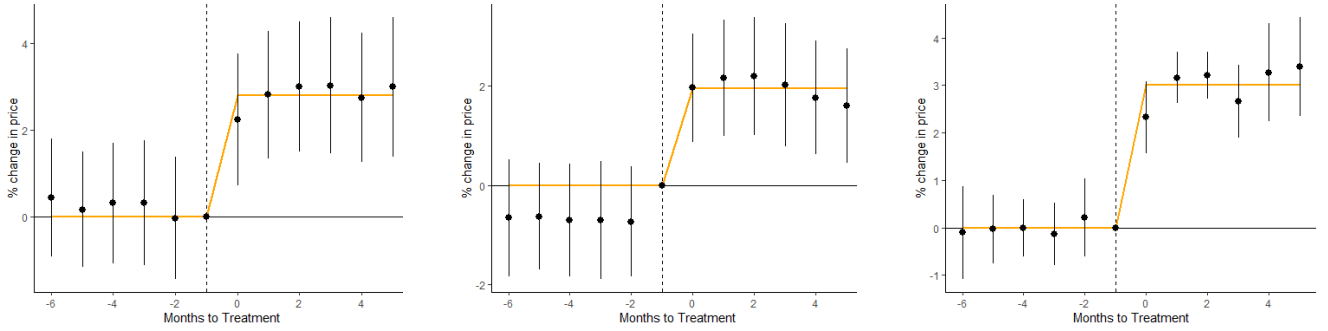
Figure 10: Impact of 2011 VAT rate cut on hospitality and tourism: Unweighted results



(a) Overall prices *(b) Food and catering prices* *(c) Hairdressing prices*

Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

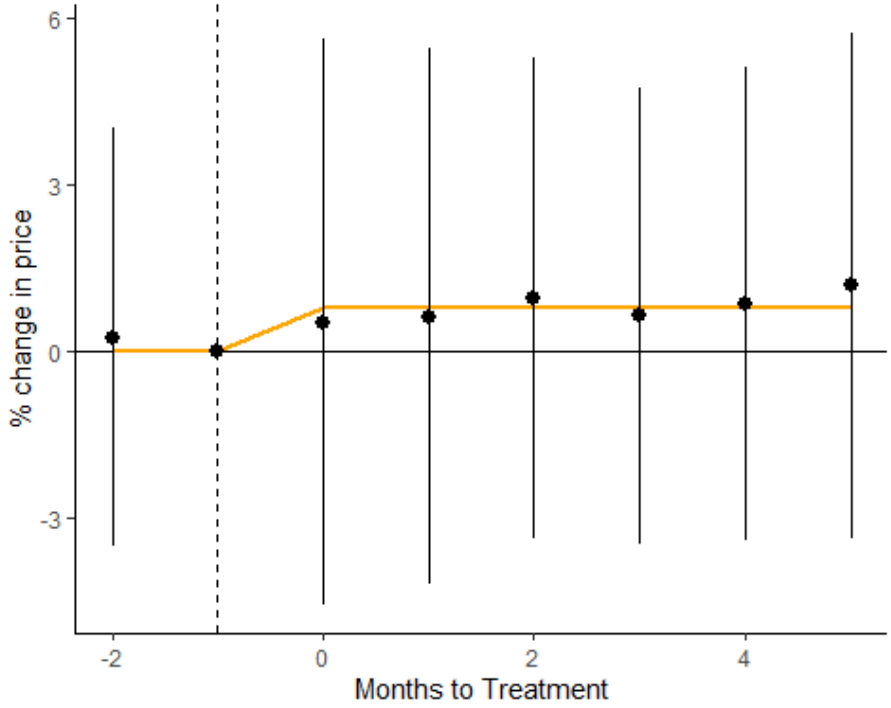
Figure 11: Impact of 2019 VAT rate increase on hospitality and tourism: Unweighted results



(a) Overall prices *(b) Food and catering prices* *(c) Hairdressing prices*

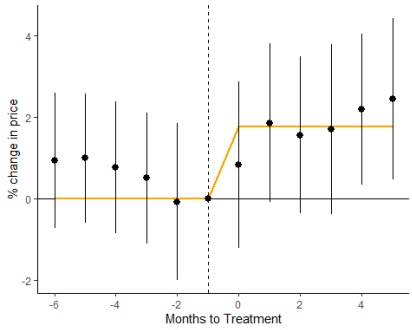
Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

Figure 12: Impact of 2020 VAT rate cut on takeaway prices: Unweighted results

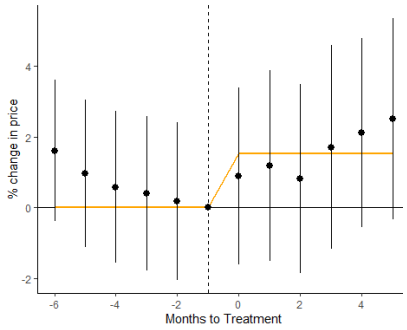


Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

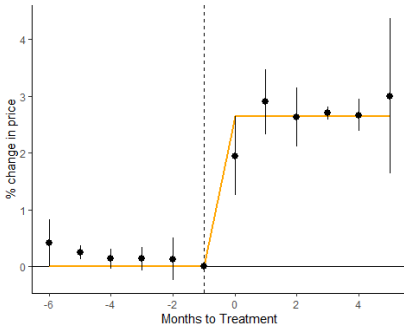
Figure 13: Impact of 2023 VAT rate increase on hospitality and tourism: Unweighted results



(a) Overall prices



(b) Food and catering prices



(c) Hairdressing prices

Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

Appendix C: Results of previous studies on the 2011 VAT rate cut for hospitality and tourism

Several studies have attempted to evaluate the economic impact of the 2011 cut to the VAT rate on hospitality and tourism, including investigating the pass-through to prices (O'Connor 2012; Deloitte 2013, 2014; Indecon 2017).

In all cases, while these provide suggestive evidence of the pass-through rates, none are causal estimates. These studies do not identify an appropriate counterfactual for the path prices would have taken in the absence of the VAT rate change. Nevertheless, below, I provide a brief overview of their empirical approach and findings, as well as highlighting some shortcomings of their empirical approach.

O'Connor (2012)

In 2012, the Department of Finance carried out an initial economic assessment of the 2011 Jobs Initiative. The results were presented in O'Connor (2012). The approach used by O'Connor (2012) to estimate the impact on prices was to use a "modelled counterfactual". Essentially the approach was to compare the post-treatment trends in prices of services impacted to that of an aggregate price index—namely CPI less energy and administered prices. O'Connor (2012) found overall prices in hospitality and tourism fell by 2% by June 2012, relative to this aggregate price index for a pass-through rate of close to 50%. This pass-through varied across sectors (hotels vs restaurants etc.).

However, it is hard to argue that this is a causal estimate. First, there is no analysis of the pre-trends of this aggregate price series and those of the services impacted by the VAT rate change. It is quite possible that they had very different trends at the time.

Second, it would be difficult to argue that the two groups of prices would be comparable, and that the aggregate price series is a good counterfactual for the treated group. It is unlikely that the treated prices would have had the same trends as the aggregate price series in the absence of the VAT rate change.

Third, the first two caveats aside, the aggregate price index of CPI less energy and administered prices includes those hospitality and tourism services subjected to the VAT rate change. As a result, any estimated pass-through would likely be biased downwards as this index includes the services for which the VAT rate was cut.

Deloitte (2013)

In 2013, Failte Ireland employed Deloitte to carry out an economic evaluation of the 2011 VAT rate changes. Their findings can be found in Deloitte (2013). Deloitte (2013) followed a similar approach to O'Connor (2012). They compared the prices of the treated services after treatment to an aggregate price index (CPI excluding energy). In this instance, Deloitte (2013) compared prices in March 2013, and found prices were 2.9% lower in the treated services relative to the aggregate price index.

Given the approach of Deloitte (2013) was essentially the same as O'Connor (2012), the caveats outlined above are also valid here. In addition, given the sample period is further extended, it is likely that further confounders are present when comparing the prices in the treated group to this aggregate price series.

Deloitte (2014)

One year later, Failte Ireland once again commissioned Deloitte to carry out an economic evaluation of the 2011 VAT rate changes. Once again, this approach followed that of O'Connor (2012). An overall price reduction of approximately 2% was found, with this varying across sectors.

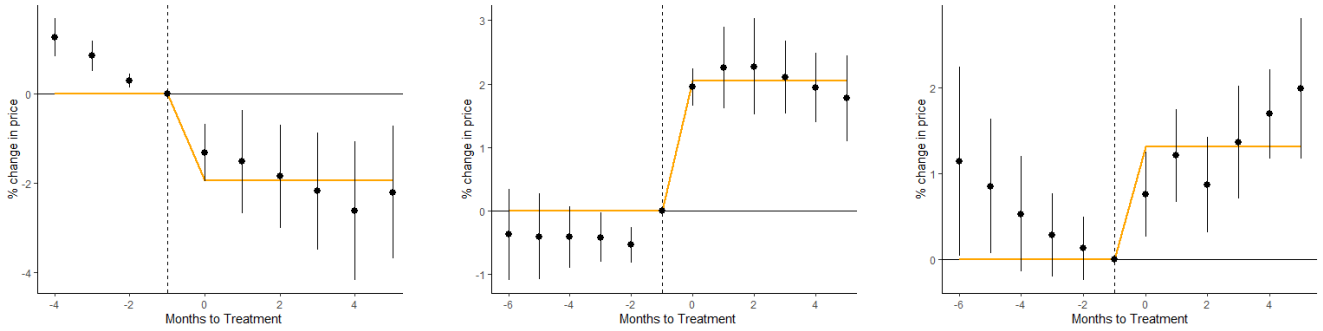
Indecon (2017)

In 2017, Failte Ireland commissioned Indecon to carry out an evaluation of the 2011 VAT rate changes. The results of the analysis were published in Indecon (2017). The empirical approach used by Indecon (2017) was to construct a counterfactual using an Error-Correction Model (ECM). Included as controls in the model were an aggregate price series, hotel occupancy and consumer sentiment. They found that prices fell by between 2.5 and 4.5% in the restaurant and food sector, while in the accommodation sector, prices fell by 1.2 to 2.5%. Indecon (2017) caution that, while suggestive, this is not conclusive evidence of pass-through.

Appendix D: Aggregate results excluding hotels

Irish hotel prices show a strong seasonal pattern that is not evident in the UK hotel price data. For this reason, in the main text, estimation is carried out using Irish hotel prices which were seasonally adjusted using Tramoseats. This appendix shows the main results of estimating equation 1 with hotel prices excluded.

Figure 14: Impact of VAT rate changes on hospitality and tourism prices: Excluding hotels.



(a) 2011 *(b) 2019* *(c) 2023*

Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

Appendix E: Pass-through of minimum wage changes to hospitality and tourism prices

At the same time that VAT rate increased in January 2019, the minimum wage also increased. This creates a challenge when identifying how much of the relative price change in Irish hospitality and tourism prices can be attributed to the VAT rate change or to the minimum wage change. To attempt to answer that question, this appendix investigates the pass-through of the minimum wage changes to hospitality and tourism prices. I do so by first, providing a likely upper bound for the impact on prices of the minimum wage increase, and second, I investigate the pass-through rate of the minimum wage changes to hospitality and tourism prices for the years before and after the 2019 increase. This will provide an indication of the typical pass-through rate of these minimum wage changes to hospitality and tourism prices, and as a result, what proportion of the relative price change post January 2019 can be attributed to the VAT rate change.

Table 4 provides an overview of the minimum wage changes in Ireland over the period 2015-2020. Each of these minimum wage changes occurred on the 1st January in their respective year. In percentage terms, the 2019 minimum wage change was the second smallest over the period, with greater increases occurring in 2016, 2017, 2018 and 2019.

Over the period 2015-2020, labour costs as a share of total costs (excluding VAT) were 35.9% in accommodation services and 33% in food and beverages.[27] Using this data, I can provide a useful upper bound on the likely pass-through of the minimum wage increase in 2019 to prices. For the sake of argument, if we assumed the labour costs were 40% of final sales price (VAT inclusive), and that all workers in the affected sectors were subject to the minimum wage, and we further assume a 100% pass-through of the minimum wage changes then we would expect to see a 1% (2.6%*40%) increase in prices following this minimum wage increase.

[27] See here for the data: https://data.cso.ie/table/HVCA08.

Table 4: Minimum wage developments in Ireland 2015-2020

Year	Minimum	% change
2015	8.65	NA
2016	9.15	5.8
2017	9.25	1.1
2018	9.55	3.2
2019	9.8	2.6
2020	10.10	3.1

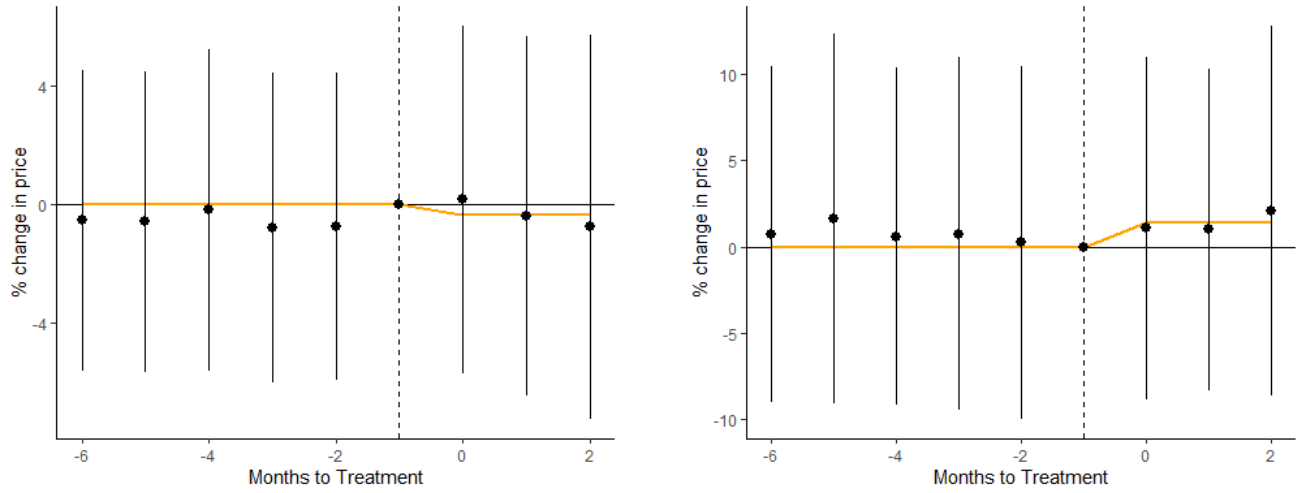
The second approach I use to assess the likely pass-through rate of the minimum wage increases to hospitality and tourism prices is to empirically estimate the pass-through of the minimum wage increases to these prices in the years 2016, 2017, 2018, and 2020. To estimate the pass-through of minimum wage changes to hospitality and tourism prices, I use the same empirical approach as that for estimating the pass-through of the VAT rate changes to prices:

$$p_{i,m} = \sum_{j \in \{-6,\dots,3\}} \beta_j \times D_{i,m-j} + \mu_i + t_m + COICOP4_i + C_c + \epsilon_{i,m}$$

While the UK also increased their minimum wage over this period, the UK follows a tax year from April 1st to March 31st of the following year. As a result, their minimum wage changes typically occur on April 1st. This allows for the identification of the minimum wage rate pass-through as the UK can act as a counterfactual for 3 months post-treatment.

Figure 15 (a) shows the main results for the pass-through of the 2016 minimum wage change to prices. The results suggest that the 5.8% increase in the minimum wage in January 2016 did not have any pass-through to prices. The estimated change in prices one month after treatment was 0.2%, but this was not statistically significant. The average aggregate post treatment change in prices was negative at -0.3%, but again this is not statistically significant.

Figure 15: Pass-through of the 2016 and 2017 minimum wage increases to hospitality and tourism prices.



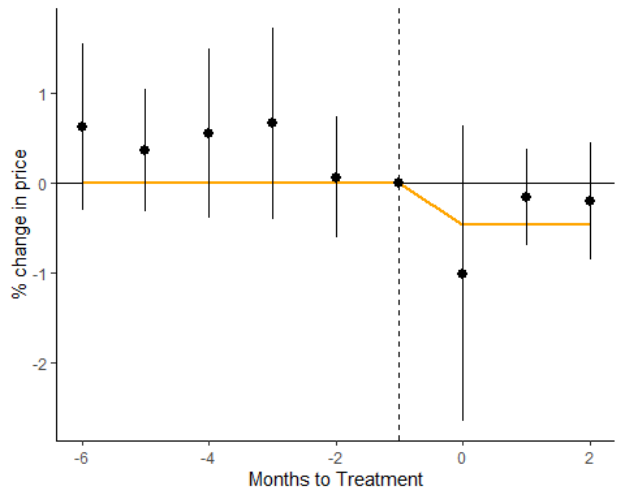
(a) 2016 *(b) 2017*

Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

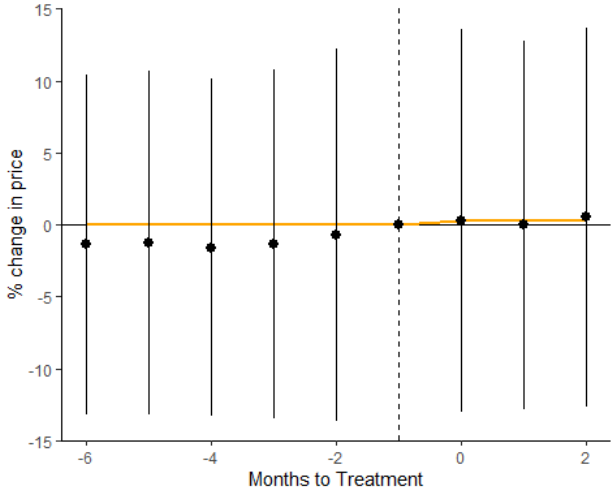
Figure 15 (b) shows the main results for the pass-through of the 2017 minimum wage change to prices. The results here are similar, a 1.1% increase in the minimum wage in January 2017 did not have any pass-through to prices. The estimated change in prices one month after treatment was 1.1%, but this was not statistically significant. The average aggregate post treatment change in prices was positive at 1.4%, but again this is not statistically significant.

Figure 16 (a) shows the estimated pass-through of the 2018 minimum wage change to prices in hospitality and tourism. In this instance, the estimated change in prices one month after treatment was negative at -1%, but this was not statistically significant. Similarly, for the entire post-treatment period, there does not appear to be any pass-through of this minimum wage change to hospitality and tourism prices.

Figure 16: Pass-through of the 2018 and 2020 minimum wage increases to hospitality and tourism prices.



(a) 2018



(b) 2020

Notes: The black dots show the event study coefficients. The black bars around the event study coefficients cover two standard errors. The standard errors are clustered at the country level using a wild bootstrap procedure. The yellow line shows the average post-treatment effect and is set to zero prior to treatment.

Figure 16 (b) shows the estimated pass-through of the 2018 minimum wage change to prices in hospitality and tourism. The results suggest that there was no pass-through of the 2018 minimum wage change to prices. Neither the estimate one month post treatment, of 0.3%, or the aggregate post-treatment estimate, of 0.3%, were statistically significant.

Taken together, there is little evidence of pass-through of minimum wage increases to prices in the hospitality and tourism industry. These results suggest that the majority (if not all) of the relative change in prices post January 2019 can be attributed to the VAT rate change.

Appendix E: Summary of findings from selected studies on VAT rate pass-through

Table 5: Selected studies on VAT rate pass-through

Paper	Country	Good or service	Increase or decrease	Empirical approach	Temporary or permanent	Pass-through
Bernardino et al. (2024)	Portugal	Essential food	Both	Event study	Temporary (originally 6 months but extended beyond 8 months)	100% and symmetrical
Kosonen (2015)	Finland	Hairdressing	Decrease	Difference-in-difference	Temporary (4 years)	43-52%
Hindriks and Serse (2022)	Belgium	Electricity	Both	Difference-in-difference	Temporary (17 months)	100% and symmetrical
Fuest, Neumeier, and Stöhlker (2024)	Germany	Standard rated goods and services; Basic food and beverages	Both	Event study	Temporary (6 months)	Asymmetric: 70% pass-through for reduction; 35% pass-through for increase
Benzarti and Carloni (2019)	France	Restaurants	Decrease	Difference-in-Difference	Permanent	9.7% pass-through
Benedek et al. (2020)	Euro zone countries	Standard rate and reduced rate goods and services	Both	Reduced form fixed-effects	Both	Standard rate = 80% pass-through. reduced rate = 28% (not statistically different from zero)
Benzarti et al. (2020)	Finland; EU countries	Hairdressing; all goods and services	Both	Matching estimator from fixed effects regression	Both	Asymmetric response: Pass-through of increase double that of decrease
Gaarder (2019)	Norway	Food	Decrease	Regression discontinuity design	Permanent	100%
De Amores Hernadez et al. (2023)	Spain	Food	Decrease	Difference-in-difference	Temporary (six months)	93%
Moral-Arce and Gomez-Antonio (2020)	Spain	Cultural goods and services	Decrease	Difference-in-difference	Permanent	46%
Fedoseeva and Van Droogenbroeck (2024)	Germany	Food (online sales)	Decrease	Difference-in-difference	Temporary	Multichannel (offline + online) = 70%; Online = 0%
Forteza, Prades, and Roca (2024)	Spain	Food	Decrease	Event study	Temporary	Between 70-100%