Estimating monthly consumer spending using card payment data

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Abstract

Household consumption is one of the most important macroeconomic indicators in Ireland. This paper produces a monthly estimate of National Accounts consumption using high frequency bank card payments data. We use granular data on card payment transactions to produce monthly estimates of Final Consumption Expenditure of Households. The estimate we construct covers approximately 88% of the CSO's equivalent annual estimate for 2023. Using this data, we find that real household consumption in 2024 continues to be strong, with year-on-year growth rates of close to 6% in the third quarter, stronger than other high frequency indicators suggest.

This report can be downloaded at www.FiscalCouncil.ie

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1. Introduction

Household consumption is a key macroeconomic indicator for Ireland. Many headline Irish macroeconomic statistics, such as GDP and investment, are heavily distorted by the presence of large multinational enterprises (Fitzgerald, 2016,2020; Honohan, 2016). This makes it difficult to gauge what is going on in the underlying domestic economy using these statistics. On the other hand, personal consumption expenditure does not face these challenges. In addition, consumption forms the tax base for one of the main sources of government revenue: indirect taxes like VAT and excise. For these reasons, it is a very important macroeconomic indicator for Ireland.

This paper produces a monthly estimate of National Accounts consumption using high-frequency bank card payments data. We use granular data on card payment transactions to produce a monthly estimate of Final Consumption Expenditure of Households. Data on card transactions are available by Merchant Category Codes, which indicate the type of goods or services being purchased. This rich data source is really useful. We map these Merchant Category code to their National Accounts consumption equivalents. This lets us produce a monthly estimate of nominal Final Consumption Expenditure of Households. Matching these consumption categories with detailed price indices from the CSO, we derive a reliable indicator of real consumption developments.

The consumption estimates produced by the Central Statistics Office (CSO) are often heavily revised (Fiscal Council, 2023). This is partly due to the use of outdated estimates for the consumption basket shares. Additionally, the current year's consumption estimates depend on high-frequency indicators that don't seem to adequately reflect consumption patterns. This is evident in the, typically large, revisions in the Annual National Accounts relative to the initial estimates in the Quarterly National Accounts.[2]

The aim of the paper is to produce a high-frequency estimate of the growth in consumption that matches consumption patterns that will eventually be shown in the Annual National Accounts. The goal is not to nowcast estimates of consumption that will be published in the near term in the Quarterly National Accounts. Given the issues relating to the construction of in-year Quarterly National Accounts estimates of consumption, we believe our estimates will be

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[2] For instance, for 2023, the Quarterly National Accounts initially suggested that consumption grew by 3.1%. When the Annual National Accounts were published, this was revised up to a growth of 4.8%.

closer to a truer reflection of consumption patterns, and these patterns will eventually be reflected in later estimates of consumption in the Annual National Accounts.

There is a dearth of high-quality high frequency indicators that can help assess consumer spending. One of the main high-frequency indicators of consumption is retail sales. Retail sales is typically one of the primary data sources used in construction of the in-year Quarterly National Accounts estimate of consumption. However, recent retail sales data do not adequately capture consumption patterns. For instance, the estimate of real growth in retail sales in 2022 ranged from −0.7% to 1.4%.[3] In contrast, the latest estimate for consumption growth for 2022 in the Annual National Accounts is 10.7%.

Another useful high frequency indicator is the data on VAT revenue. As consumption is the main tax base for VAT, VAT receipts typically reflect consumption patterns. However, this too has some drawbacks.

First, only aggregate VAT revenue is available on a timely basis. Second, VAT returns are filed every second month, meaning the data does not give an accurate month-by-month picture. Third, VAT is liable, not only on the consumption of goods and services, but also on the purchase of materials for building and construction. Under the National Accounts definitions, building and construction purchases would not be included in consumption. Fourth, VAT receipts are directly impacted by VAT policy changes. This may make it difficult to compare changes in revenue across time and distinguish the underlying growth rate of consumption. In addition, there are also timing issues with the VAT revenue data. The VAT revenue data is based on cash accounting, meaning that the revenue shows up at the time the VAT returns are filed, not the time in which the consumption actually took place. In contrast, the national accounts estimate of consumption is accrual based—the consumption is booked at the time the activity takes place. Finally, there is no volume measure of VAT receipts. While crude volume measure of VAT receipts can be constructed based on available price indices, these are less than ideal.

An alternative high frequency measure of consumer spending is the Central Bank card payments statistics. Indeed, recent work by Byrne et al. (2020), Cronin and

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[3] This is based on the retail sales index that was available at the time, the retail sales index with base 2015=100. The range includes the indices of "All retail businesses", "All retail businesses, excluding motor trades" and "All retail businesses, excluding motor trades and bars". Retail sales is more heavily weight towards goods consumption. Goods consumption in the National Accounts grew by 6.1% in 2022.

McInerny (2020), and Timoney (2022), amongst others, uses the Central Bank card statistics to great effect to assess spending patterns in the Irish economy during the Covid-19 pandemic.

This paper builds on this recent work and uses more recently published granular data on transactions to produce a monthly estimate of Final Consumption Expenditure of Households. The estimate we produce covers approximately 88% of the CSO's equivalent estimate for 2023. Using this data, we find that real household consumption in 2024 continues to be strong, with year-on-year growth rates averaging between 3 and 6% in recent months, stronger than other indicators like retail sales would suggest.

2. Background on central bank card payment statistics

Since 2015, the Central Bank has published card payment statistics for debit and credit cards. Over this period, the data has been refined with changes to the scope and amount of detail being published. The latest iteration has been published in spreadsheet format, accompanied by a PDF report and is also published on the Central Bank of Ireland's Open Data Portal.[4] This latest iteration covers data since October 2022.

The current iteration of the data covers three main transaction types:

> Cash withdrawals – This covers ATM withdrawals and cashback at shops and businesses.

> Point-of-sale transactions – These are transactions in shops and businesses paid by card.

> Online transactions – These are transactions with shops and businesses that do not occur in person, but instead occur online (or over the phone).

Both point-of-sale and online transactions can be grouped together as "card spending".

The majority of card transactions relate to point-of-sale and online transactions rather than cash withdrawals (Figure 1). In the 12 months to March 2024, this totalled €108.3 billion, of which €94.4 billion was card spending and €13.9 billion were cash withdrawals. Monthly spending peaked in December, with €10.1 billion being spent during the month.

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[4] The Central Bank of Ireland's Open Data Portal can be found here: https://opendata.centralbank.ie/.

Figure 1: Central bank of Ireland card transaction data

€ billion

Card spending · Cash withdrawals
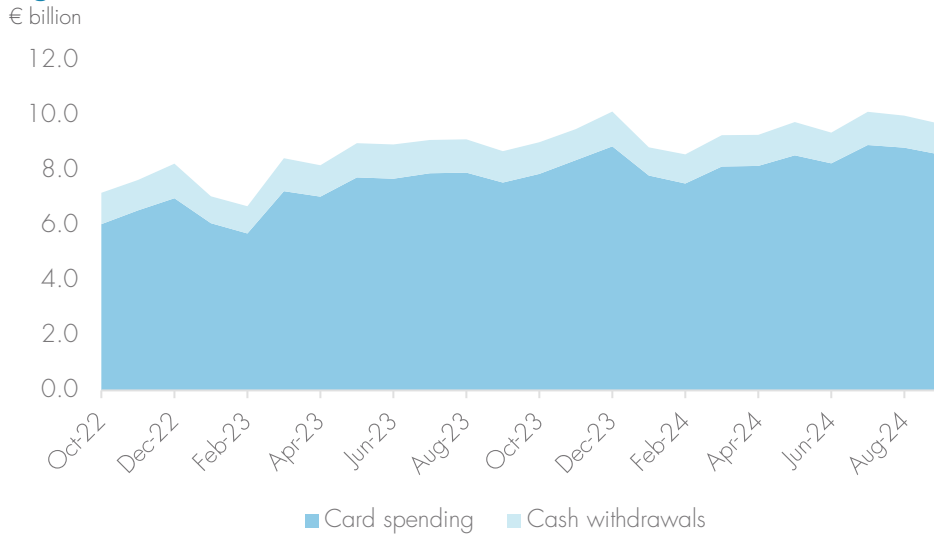
Sources: Central bank of Ireland.

Cash withdrawals represent a declining share of total transactions in recent years (Figure 2). This trend was evident prior to the Covid-19 pandemic, but Covid-19 represented a level shift downwards in the share of cash withdrawals (Cronin and McInerny, 2022), and the declining use of cash has continued since then.

Figure 2: Cash has been a declining share of total card transactions

%, cash withdrawals as a share of total card transactions
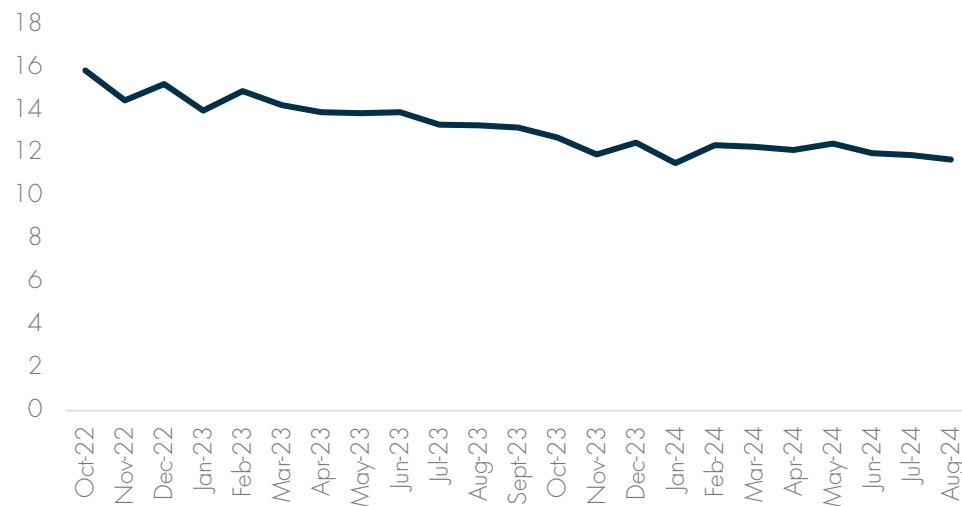
Sources: Central Bank of Ireland.

The Central Bank provides further information on point-of-sale and online transactions.[5] This relates to the businesses at which the transactions took place.

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[5] This data is available on the Central Bank's open data portal here:
https://opendata.centralbank.ie/dataset/monthly-card-payment-statistics/resource/6ecf9975-8bc9-4872-a62c-7916a7f8988f.

That is, the Central Bank provides the monthly transactions by Merchant Category Codes. These are codes used to classify businesses according to the goods and services that are primarily sold at these businesses. A sample of the merchant category codes are shown in Table 1.

This data is extremely useful and allows for the grouping of serval goods and services into similar categories. Using these codes, the Central Bank has created their own grouping of items (Columns 3 & 4 of Table 1). However, these do not align with groupings used in the National Accounts. Instead, using these merchant category codes, we are able to allocate the Central Bank card payments data to the Classification of Individual Consumption According to Purpose (COICOP) categories, as measured under the National Accounts (Columns 5 & 6 of Table 1).

There is a large structural break in the data in March 2023. This is due to the inclusion of "additional customer accounts that fall within the scope of the reporting requirements". This makes it difficult to draw any conclusions from comparisons that relate to the period prior to March 2023. The Merchant Category Code data is only available from October 2022, meaning that the furthest possible date the consumption estimate could be extended back to is October 2022. However, it is not possible to backcast the data prior to March 2023 as it is unclear what the appropriate level of each series should be for these months. For this reason, the paper focuses on the post March 2023 period.

Table 1: Sample merchant category codes

Merchant Category Codes	Description	Central Bank Category	Central Bank Sub Sector	COICOP	Goods or services
1353	Dia (Spain)-Hypermarkets of Food	Retail	Groceries/Perishables	Supermarket	Goods
5122	Drugs, Drug Proprietaries, and Druggist Sundries	Retail	Groceries/Perishables	CP06	Goods
5193	Florists Supplies, Nursery Stock, and Flowers	Retail	Groceries/Perishables	CP09	Goods
5199	Nondurable Goods (Not Elsewhere Classified)	Retail	Groceries/Perishables	non-categorizable	Goods
5333	HYPERMARKETS OF FOOD	Retail	Groceries/Perishables	Supermarket	Goods
5411	Grocery Stores, Supermarkets	Retail	Groceries/Perishables	Supermarket	Goods
5441	Candy, Nut, and Confectionery Stores	Retail	Groceries/Perishables	CP01	Goods
5451	Dairy Products Stores	Retail	Groceries/Perishables	CP01	Goods
5462	Bakeries	Retail	Groceries/Perishables	CP01	Goods
5499	Miscellaneous Food Stores	Retail	Groceries/Perishables	Supermarket	Goods
5912	Drug Stores and Pharmacies	Retail	Groceries/Perishables	CP06	Goods
5921	Package Stores—Beer, Wine, and Liquor	Retail	Groceries/Perishables	CP02	Goods
5977	Cosmetic Stores	Retail	Groceries/Perishables	CP012	Goods
5992	Florists	Retail	Groceries/Perishables	CP09	Goods
5995	Pet Shops, Pet Food, and Supplies	Retail	Groceries/Perishables	CP09	Goods

Sources: Central Bank of Ireland.
Notes: Data show a subset of Merchant Category Codes for the Central Bank Sub Sector category of Groceries/Perishables. Columns 1 to 4 are from the Central Bank's Card payment statistics. Columns 5 & 6 are based on the Author's mapping of merchant category codes to COICOP categories. See section 3 for details.

3. From card transactions to national account Consumption

The aim of this paper is to produce a monthly estimate of consumption using card transaction data that aims to approximate the estimates of consumption in the National Accounts. Similar work has been carried out in other jurisdictions. For instance, Buda et al. (2022) have produced estimates of consumption for Spain using the transaction data from one Spanish Bank. However, in their case, they have access to all bank transactions for one main bank. In our case we have access only to card transactions, but these card transactions cover all reporting banks in Ireland.

Our estimate of consumer spending relies heavily on the detailed card payment statistics published by the Central Bank of Ireland. However, some additional assumptions are required to ensure the estimate is in line with the National Accounts definition of consumption. These assumptions are outlined in this section.

3.1 Assigning Merchant Category Codes to consumption categories

The Central Bank data on card transactions by Merchant Category Codes is really useful. It allows us to map transactions onto the COICOP categories used in the National Accounts, allowing us to identify what should be considered consumption under the National Accounts definition. It also allows us to appropriately deflate each category by their corresponding HICP index to get a more accurate estimate of real consumption.

COICOP categories are defined across two main dimensions. We map from the Merchant Category Codes to these two main dimensions.

Firstly, consumption is categorised according to durability, namely: durable goods, non-durable goods, semi-durable goods, and services. However, with the Merchant Category Codes it is often not possible to distinguish between durable, non-durable, and semi-durable goods. As a result, we instead map from the Merchant Category Codes to goods and services.

Secondly, consumption is split into categories by their purpose. That is, we split consumption into the 12 European COICOP categories.[6] For instance, category

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[6] See here for further details: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:COICOP_HICP.

CP01 relates to Food and Non-Alcoholic Beverage consumption, and category CP10 relates to consumption of Education goods and services. Here we map from the Merchant Category Codes to the 12 main COICOP categories (CP01-CP12) currently used by the CSO in the Annual National Accounts (Table 2).[7]

We assign the mapping based on the predominant activity that takes place at that business. A small minority of sales that takes place in certain businesses may relate to sales of goods and services unrelated to the predominant COICOP category. For instance, off-licences, which predominately sell alcoholic beverages, may also sell non-alcoholic beverages. In this instance, the predominant category CP02 — Alcoholic Beverages, Tobacco, Narcotics, is used. There are cases where this may not be suitable, for instance, for Department stores and supermarkets. These are discussed in more detail in Section 3.4.

The full mapping from Merchant Category Codes to COICOP categories is reported in Appendix A. This mapping was guided by work by the United Nations (2018) and informed by Buda et al. (2022).

Table 2: COICOP categories

Category	Description
CP01	Food and Non-Alcoholic Beverages
CP02	Alcoholic Beverages, Tobacco, Narcotics
CP03	Clothing and Footwear
CP04	Housing, Water, Electricity, Gas, and Other Fuels
CP05	Furnishings, Household Equipment, and Routine Maintenance
CP06	Health
CP07	Transport
CP08	Communication
CP09	Recreation and Culture
CP10	Education
CP11	Restaurants and Hotels
CP12	Miscellaneous Goods and Services

Sources: CSO.

3.2 Non-consumption

Included in the card transactions data is spending on items that would not normally be considered consumption under the national accounts. This is spending that would not fall into the COICOP categories. This includes spending on

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[7] A breakdown of consumption by category in the Annual National Accounts can be found here: https://www.cso.ie/en/releasesandpublications/ep/p-ana/annualnationalaccounts2023/gdpbyexpenditures/personalspending/.

building and construction materials for home improvements. Depending on the scale of building and construction, these would either be classified as intermediate consumption of the household or as investment spending (gross fixed capital formation). As a result, spending linked to Merchant Category Codes that are identified as relating to building and construction is treated as non-consumption spending and not included in the proxy estimates of consumption.

Another key category included in the card spending data that does not count as consumption on the National Accounts are financial transfers.

Financial transfers from one individual to another, or indeed from one account of an individual to another of their accounts is not considered consumption. However, in some cases these may show up in the card payment statistics data. These transactions could occur, for instance, when people dine out together and the bill is paid using one card, with the rest of the group then sending the primary card holder their share of the bill. Cases like this could result in a double counting of consumption if the financial transfers were also counted as consumption. For this reason, card transactions identified by their Merchant Category Codes as financial transfers are excluded from the consumption estimate.

Figure 3: Non-consumption related card spending has been a rising share of card spending

€ billion
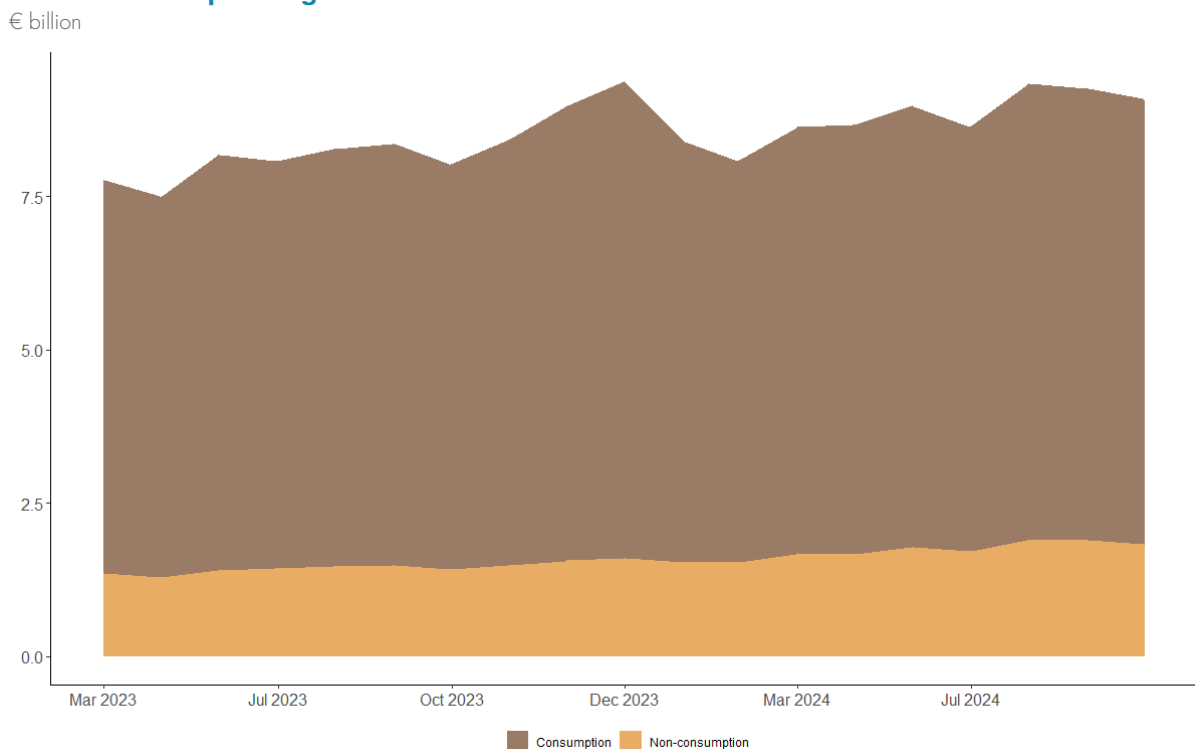
Sources: Authors' workings.
Notes: Figure shows card spending data of card transactions on consumption, as defined in the National Accounts, and non-consumption.

Figure 3 shows the breakdown card spending identified as consumption and non-consumption based on their merchant category codes. Non-consumption related transactions have risen from 16% of card transactions in October 2022 to 20.2% of card transactions in September 2024. Given this rising share of non-consumption in the card payment statistics using the raw card payment statistics would give a misleading steer on the trends in consumption.

3.3 Rent

One of the largest components of consumption, as defined by the national accounts is the consumption of housing services. This includes both rent paid and imputed rents of owner occupiers— rent not actually paid, but that would be due if housing assets were not owned.[8] In 2022, rental consumption made up almost 20% of total consumption.

The Central Bank card data do not provide detailed information on payments for rent. Typically, rental payments are made by direct debits, or by cash. However, some rental payments are likely to be made through cards. These would likely show up as financial transfers in the card payments statistics. However, the card payments data will not provide any information on imputed rents. In addition, it is not possible to disentangle which financial transfers are for rent payments. As already outlined, we have excluded financial transfers for the calculations of the proxy consumption.

Given the size of rental consumption in total consumption, any proxy estimate of consumption needs to take rental consumption into account. As the population and the housing stock have grown relatively slowly (compared to other macroeconomic variables), growth in rental consumption has typically been slower than growth in overall consumption. Over the period to 1995-2023, overall consumption grew by 3.7% on average in real terms, whereas rental consumption only grew by 2.4%. Given the size of rent in total consumption, and the differential in average growth rates, not factoring in rental consumption into the proxy estimate of consumption could potentially give a misleading indication of the growth rate of consumption.

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[8] The Office of National Statistics (ONS) in the UK defines imputed rent as: "an estimate of the housing services consumed by households who are not actually renting their residence. It can be thought of as the amount that non-renters pay themselves for the housing services that they produce. As such, imputed rental should represent the economic value per period to homeowners of their dwellings, equivalent to if they were to rent out their properties. By definition, however, a homeowner does not receive payment on their property, and so the payment must be 'imputed'".

As a result, we estimate rental consumption and add this to our proxy estimate of consumption.

For historical nominal rental consumption, we set the sum of the monthly estimates of rental consumption to be equal to annual figures in the Annual National Accounts.[9] We do so using the Denton-Cholette temporal disaggregation method (Cholette, 1984). This approach works well for the period covered by the Annual National Accounts data. However, it will not work for more recent months as data for rental consumption is not available.

To get estimates for more recent months we take the following approach. First, we deflate the monthly nominal rental consumption by the rental price series available from the HICP price index (CP041). This gives us an estimate of the volume of rental consumption at 2015 prices. Second, to project forward for the more recent data we use a simplistic approach: we use the most recent annual rental consumption growth rate from the national accounts and assume this growth rate is unchanged for the more recent months. The reason for this is the volume of consumption is relatively slow moving and shows a high degree of autocorrelation.[10]

This gives us an estimate of real consumption of housing services for the more recent period. To get the nominal values for this period, we reflate this data with the rental price index (CP041).

3.4 Direct debits, standing orders, and utilities

The Central Bank card payment statistics are detailed and provide a wealth of information on consumer transactions. However, they do not cover all consumer transactions. For instance, they do not cover direct debits, standing orders or bank transfers.

These payment methods are likely to be the main method of payment for many utilities—like electricity or gas. As a result, basing estimates of consumption of utilities on the card payment statistics with the relevant merchant category codes for these utilities, is likely to underestimate consumption.

Given the disparity between the two figures, not factoring in this form of consumption would significantly underestimate the total level of consumption. In

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[9] This data is available here: https://www.cso.ie/en/releasesandpublications/ep/p-ana/annualnationalaccounts2023/gdpbyexpenditures/personalspending/.

[10] The autocorrelation of the growth rate of the volume of rental consumption is 0.84

addition, due largely to weather variability, consumption of these utilities can be very volatile from year to year. This is true both in terms of real and nominal consumption. This variability could significantly alter the growth rates of consumption.[11]

To overcome this issue, a simple approach—and the approach used in this paper—is to scale up the data from the two Merchant Category Codes so that the value for 2023 equals the official value for CP045 published by the CSO. This approach would work provided that the monthly consumption patterns captured by the two Merchant Category Codes matches the consumption patterns of electricity, gas, and other fuels. Appendix B provides some suggestive evidence to that affect.

An alternative option for estimating the monthly consumption of these utilities, would be a similar estimation approach as that for rental consumption. That is, instead of using the data from the two Merchant Category Codes, for the historical data, the annual historical data from the Annual National Accounts could be used. This would require appropriate and timely monthly indicators for each utility to disaggregate the annual estimate to monthly data, and trend forward the more recent months. This would be possible provided that the appropriate weights of consumption of electricity, gas and other fuels in the COICOP category CP045 were known. For gas, data for the volume of daily metered gas consumption is available from the CSO. However, this data is not disaggregated enough. It also includes gas consumption by businesses with low gas demand. For electricity, there is no residential consumption data available at this high frequency and published in a timely manner. Given these issues the simpler approach outlined above is favoured.

3.5 Supermarkets and Department stores

Some Merchant Category Codes relate to business that sell multiple items, such as supermarkets or department stores. These businesses can sell items across a broad range of COICOP categories, like food (CP01), alcohol (CP02), clothes (CP03), washing detergent (CP05), soap (CP12) to name but a few. Typically, it is clear whether these categories relate primarily to goods or services. However, it is trickier to classify them into the 12 main COICOP categories.

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[11] This is particularly a concern for the real growth rates. The prices for these series are very volatile. Deflating a nominal value of €7.3 billion versus a nominal value of €1.3 billion with these series would make a large difference to the estimates of real consumption.

To categorise spending in supermarkets and department stores accurately, we rely on estimates produced elsewhere. Understanding what categories of spending takes place in these stores requires more disaggregated information on the proportion of spending on each category that takes place at these businesses. This information is currently not publicly available for these businesses in Ireland. As a proxy, we follow Buda et al. (2022) and use Spanish data in the absence of appropriate Irish data.

3.6 Non-categorisable consumption

As with supermarkets and department stores, some Merchant Category Codes are not descriptive enough to allow categorisation into COICOP categories. These include codes like "Direct Marketing - Catalogue Merchant", "Miscellaneous Specialty Retail", and "Miscellaneous Business Services". However, their descriptions do allow us to easily categorise these into either goods or services.

As it is not possible to place these into one of the 12 COICOP categories, these are left as an uncategorisable category (i.e. a 13th Category).

3.7 Cash withdrawals

Cash withdrawals are a large but declining share of card payment transactions (see Section 2). It is likely that a lot of these cash withdrawals are for consumption. As a result, these need to be taken into account when arriving at consumption estimates. However, there are a few issues to deal with when trying to incorporate these cash withdrawals into estimates of consumption.

First, timing is an important issue. Cash may be withdrawn in one period, but not spent in the same period. As a simplifying assumption, we assume that all cash withdrawn in a given month is spent in that month.

Second, whether the cash spending would be treated as consumption, and what category of consumption it falls into matters. Unfortunately, there is no data on where this withdrawn cash ultimately ends up being spent. It is likely that a lot of this cash is spent on consumption items, however some may be spent on non-consumption items, such as building and construction purchases or cash transfers.

To allocate the cash spending to COICOP codes, we first split cash withdrawals into foreign and domestic withdrawals. We do this as cash spending domestically is likely to have a different distribution across COICOP codes than international

cash spending. For instance, international cash spending might be more skewed towards the hospitality sector than domestic cash spending.

Figure 5: Distribution of domestic point-of-sale purchases
% of total point-of-sale transactions
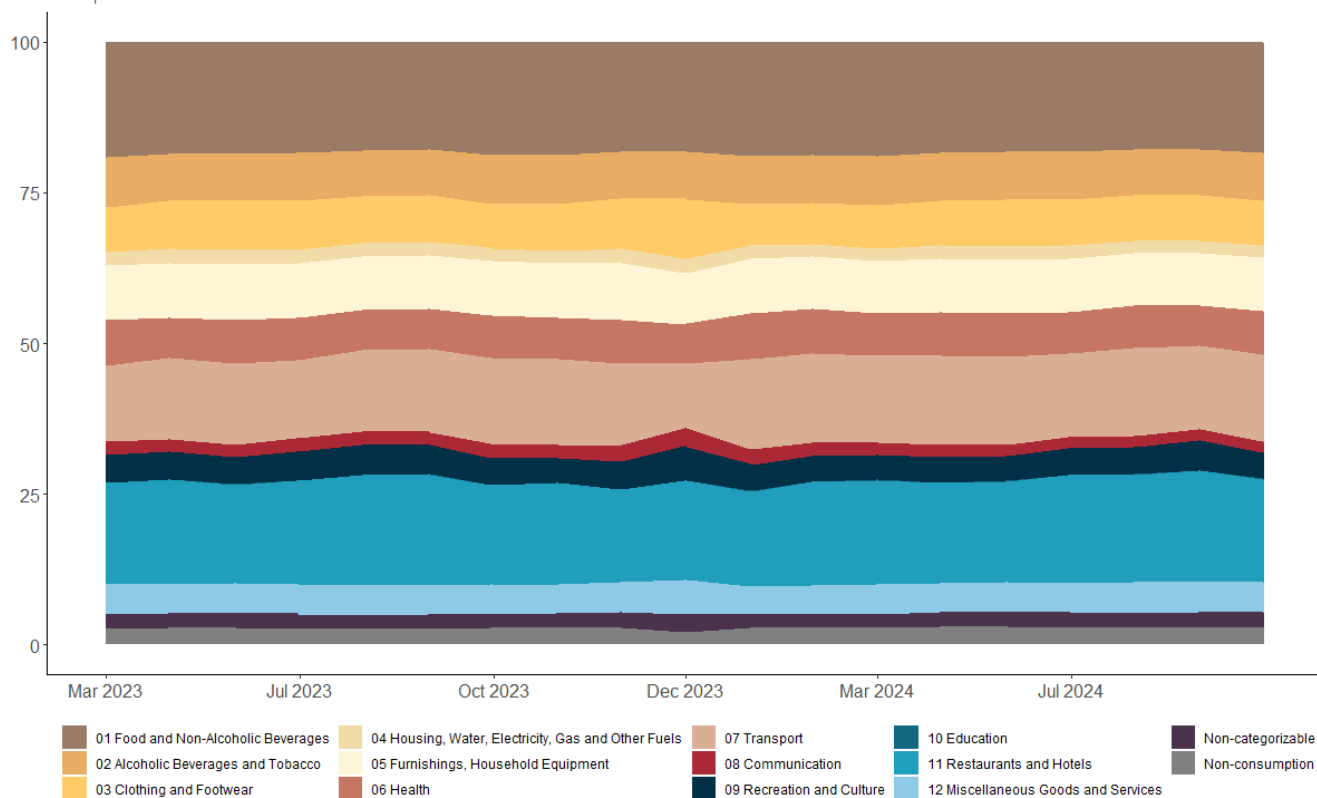
Sources: Central Bank of Ireland and Author's workings.

Indeed, the largest categories of domestic point-of-sale transactions is the consumption of food and non-alcoholic beverages and consumption of restaurant and hotel services (Figure 5). Whereas the largest share of international point-of-sale transactions, at close to half, takes place in restaurants and hotels (Figure 7).

In contrast, the distribution of remote (online) transactions (Figure 6) is skewed towards non-consumption (financial transfers). The next largest share of online transactions is recreation and culture. This is likely related to sales of tickets for various cultural and sporting events. By contrast, payments related to recreation and culture represent a much smaller share of point-of-sale transactions (Figure 5 & 7).

Figure 6: Distribution of online transactions
% of total online transactions

Legend:
- 01 Food and Non-Alcoholic Beverages
- 02 Alcoholic Beverages and Tobacco
- 03 Clothing and Footwear
- 04 Housing, Water, Electricity, Gas and Other Fuels
- 05 Furnishings, Household Equipment
- 06 Health
- 07 Transport
- 08 Communication
- 09 Recreation and Culture
- 10 Education
- 11 Restaurants and Hotels
- 12 Miscellaneous Goods and Services
- Non-categorizable
- Non-consumption
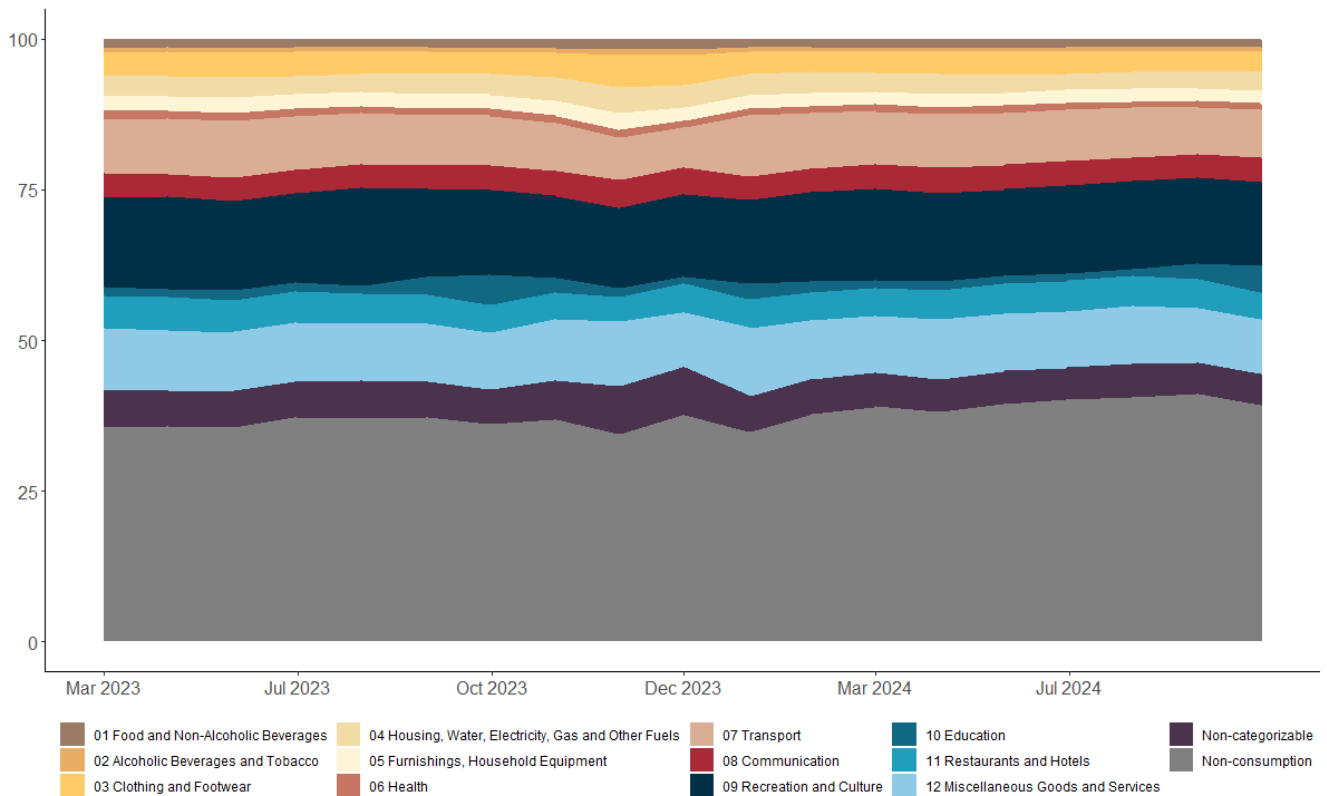
Sources: Central Bank of Ireland and Author's workings.

As a simplifying assumption, we assume cash spending looks much like domestic point-of-sale transactions. That is, for domestic cash spending, we assume the distribution across Merchant Category Codes is identical to the distribution of domestic point-of-sale transactions (Figure 5). We do not use the distribution of total card transactions (point-of-sale and online spending) as online spending is likely to be skewed to a different distribution of goods and services than cash spending (Figure 6). Given that both cash and point-of-sale transactions occur face to face, the distribution of point-of-sale transactions across Merchant Category Codes is likely to be more in line with the distribution of cash spending.

Similarly for international cash spending, we assume that international cash spending has the same distribution across Merchant Category Codes as the international point-of-sale transactions.

Figure 7: Distribution of international point-of-sale purchases

% of total international point-of-sale transactions

Legend:
- 01 Food and Non-Alcoholic Beverages
- 02 Alcoholic Beverages and Tobacco
- 03 Clothing and Footwear
- 04 Housing, Water, Electricity, Gas and Other Fuels
- 05 Furnishings, Household Equipment
- 06 Health
- 07 Transport
- 08 Communication
- 09 Recreation and Culture
- 10 Education
- 11 Restaurants and Hotels
- 12 Miscellaneous Goods and Services
- Non-categorizable
- Non-consumption
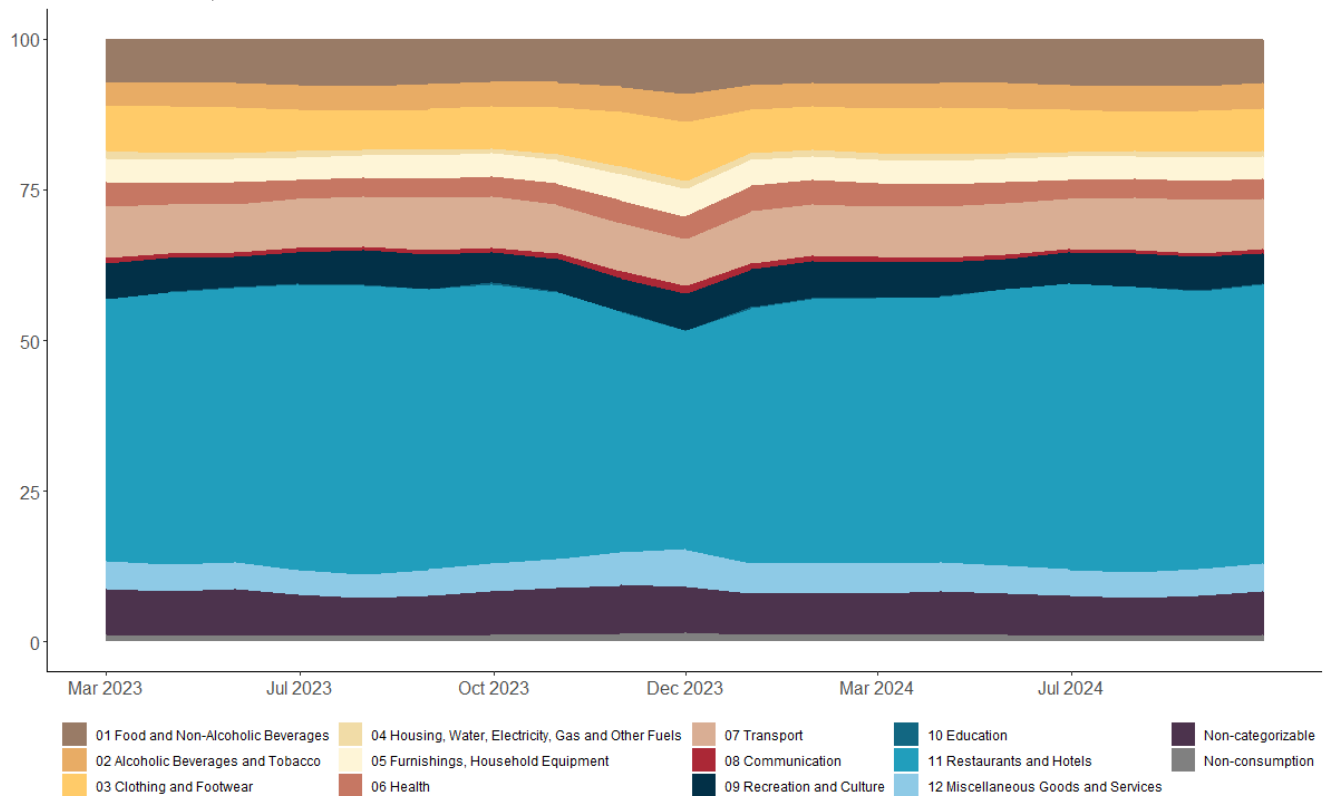
Sources: Central Bank of Ireland and Author's workings.

3.8 Personal vs Final Consumption Expenditure and social transfers in kind

The headline consumption value published by the CSO is called Personal Consumption Expenditure. This captures final consumption expenditure of domestically resident households, but also includes the consumption expenditure of what are called non-profit institutions serving households (NPISH), and government expenditure on goods and services provided to households (social transfers in kind via market producers):[12]

Personal Consumption Expenditure
= Final Consumption Expenditure of households
+ Final Consumption Expenditure of NPISH
+ Government Expenditure on goods and services for households

The Central Bank card transactions data is solely based on card transactions of households. There is no data on the transactions of NPISH. Likewise, the dataset does not include information on government expenditure on goods and services

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[12] NPISH are essentially charities.

for households. For this reason, the proxy estimate of consumption is more in line with Final Consumption Expenditure of households than Personal Consumption Expenditure—the headline indicator the CSO produce.

3.9 Sources of measurement error

While the Central Bank card transaction data provides a wealth of potential information on consumption, it does not cover the universe of consumption transactions. As a result, there is likely to be some in-built measurement error in the proxy estimates of consumption. We note four potential sources of measurement error:

1) One of the largest areas of consumption that the Central Bank card data does not cover are those likely paid in the form of bank transfers, direct debits and standing orders. While some effort has been made to account for this, particularly for utilities, some gaps are likely to remain. For instance, payments to internet providers are also likely to be paid by direct debit.

2) Measurement error is likely to come from Financial Intermediation Services Indirectly measured—or FISIM. As the name suggests, this consumption is indirectly measured. As a result, in the National Accounts data produced by the CSO, this consumption is imputed by the CSO, and it is not possible to estimate this using the card data.[13]

3) Measurement error could also arise from the consumption by residents who are not from Ireland, particularly those from other EU countries. These residents may not have an Irish bank account due to IBAN discrimination not being permitted within the EU—an Irish employer or utility cannot insist that you have an Irish bank account. This may reduce their incentive to set up an Irish bank account. As a result, their consumption may not be captured by the Central Bank card data but would be included in the CSO's estimate of consumption. This may result in an underestimate of consumption and if these immigrants have different consumption patterns to the rest of the population this may impact the distribution of consumption by category.

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[13] For more information on FISIM, see here:
https://www.cso.ie/en/interactivezone/statisticsexplained/nationalaccountsexplained/fisim/.

4) One of the largest sources of error is likely to come from the assumptions around the spending of cash. The distribution of cash spending across consumption and non-consumption may not be the same as that of the point-of-sale transaction data. Indeed, there may be more non-consumption, particularly building and construction, in cash spending than in the point-of-sale transaction data.

4. Nominal proxy estimates of consumption

The estimate of nominal consumption is simply the sum of the 13 categories (12 COICOP categories and 1 non-categorisable category). Aside from the rescaling of utilities consumption in CP045—Electricity, gas and other fuels, no additional reweighting is applied to the estimates.

Figure 8 shows the nominal estimates of our proxy for consumption broken down into 2-digit COICOP categories. Since March 2023, monthly consumption has averaged €10.5 billion. The largest category of consumption is CP04 — Housing, Water, Electricity, Gas, and Other Fuels. This makes up an average of 30% of consumption each month. This is largely due to the inclusion of the consumption of housing services (rent) in this category.

What is also notable from this nominal data are some clear seasonal patterns. A substantial drop in spending is evident after Christmas. This drop is largest in clothing and footwear, which falls by 41% in January.

Figure 8: Nominal proxy estimates of consumption by category

€ billion, by 2-digit COICOP category
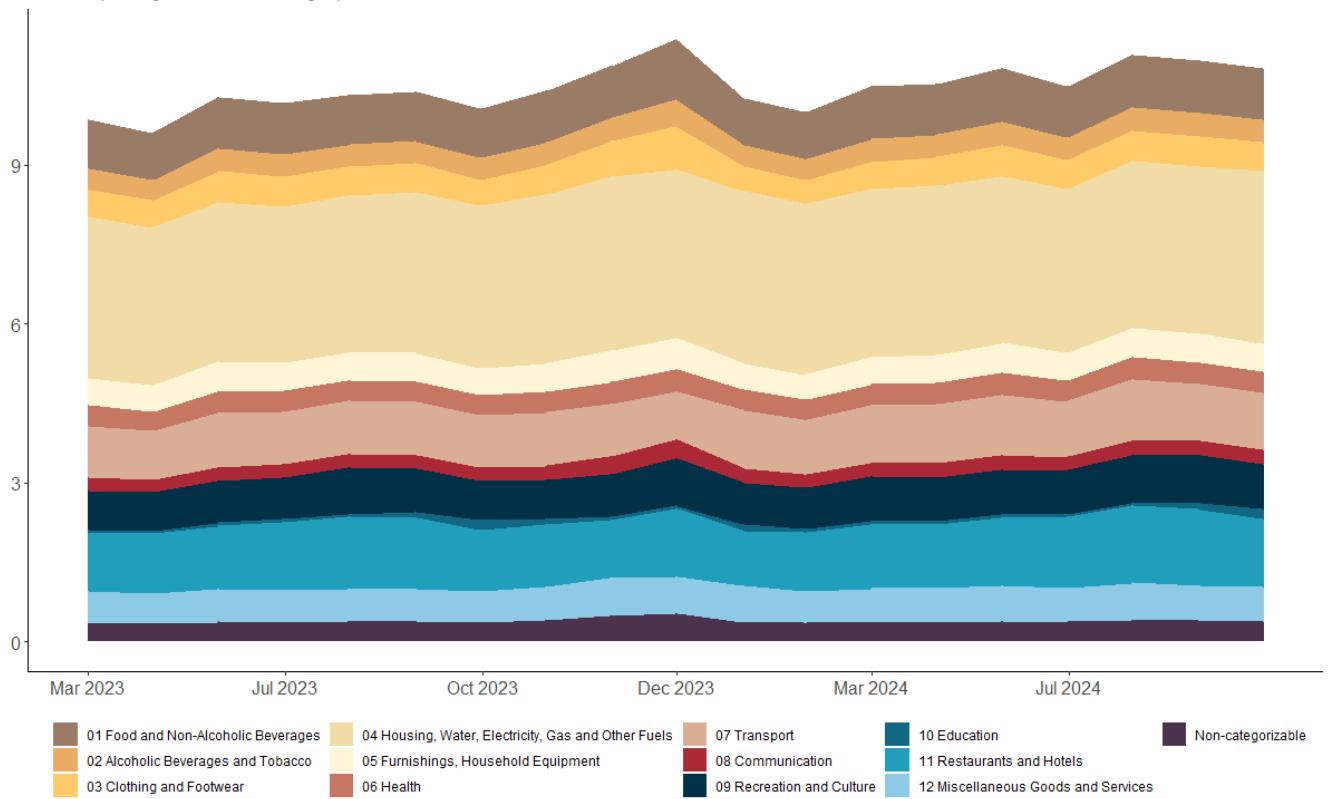
Sources: Author's workings.

Figure 9 shows the distribution of consumption by goods and services. Goods make up an average of 44% of consumption, while services are 56%. All of the seasonal fall post-Christmas appears to be due to goods, which fell by 22% in January. In contrast, services appear to increase by 3.5%.

Figure 9: Nominal proxy estimates of consumption by category
€ billion, split by goods and services
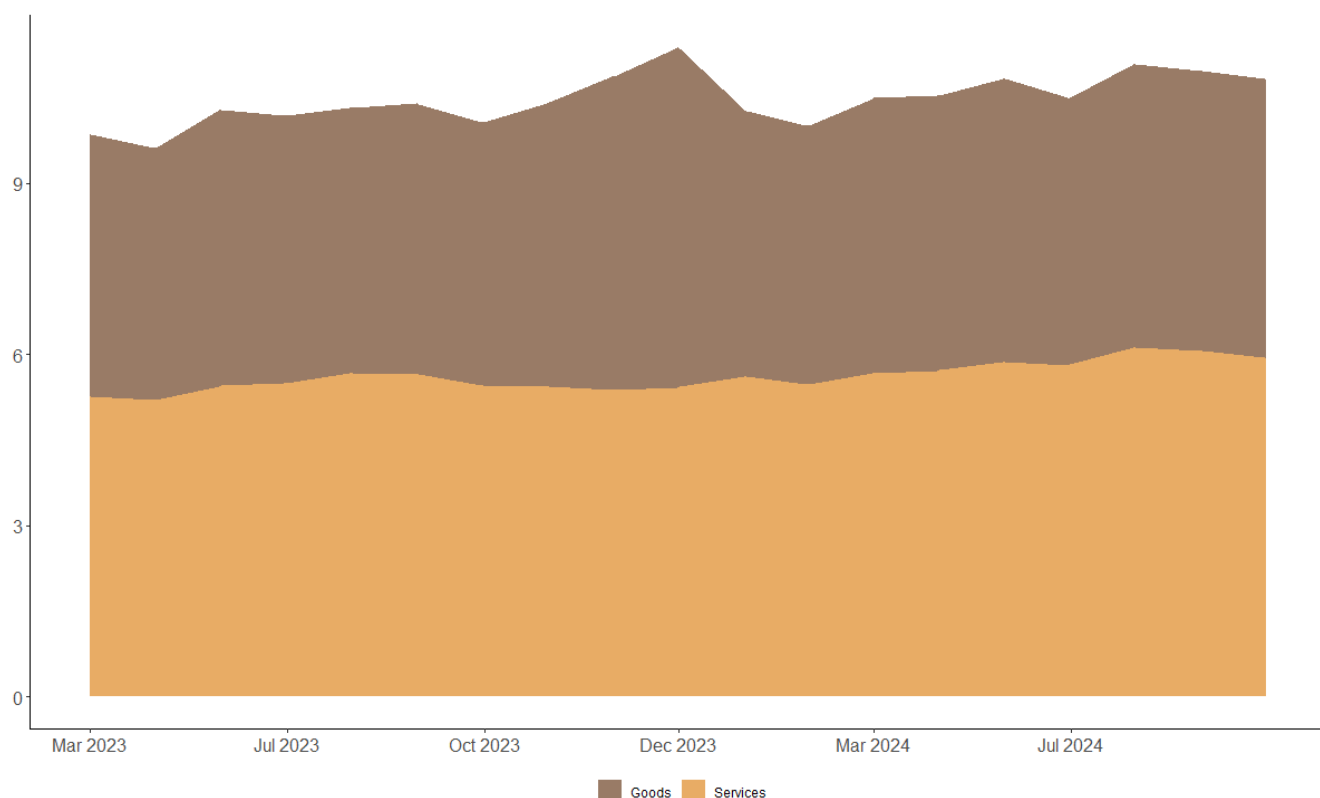
Sources: Author's workings.

4.1 Comparison with the CSO's official data

A natural question is how these consumption estimates match the official estimates produced by the CSO.

To gauge how well our estimates work, we compare these with the CSO's Annual National Accounts estimates. However, given the structural break in the dataset, the earliest consistent 12-month time period spans from March 2023 to February 2024. This is not exactly in line with the calendar year estimates published by the CSO.

As a result, a direct comparison cannot be made given the differing time periods.[14] However, given the overlap between the periods, a comparison between the CSO data for 2023 and the proxy estimate from March 2023 to

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[14] In time, when the CSO publish the Annual National Accounts for 2024, a direct comparison will be possible between the calendar year estimates of proxy consumption for 2024 and the CSO's official data for 2024.

February 2024, can still provide suggestive evidence of the usefulness of the proxy consumption indicator.

In theory, we would expect our proxy to be higher. Our proxy covers some of 2024. Were there the proxy to fully capture 100% of the CSO's COICOP data, the proxy values would still be higher due to timing differences. This is because prices continued to increase in 2024, and all indications point to real increases relative to 2023.[15]

Figure 10 shows the coverage across COICOP codes of the proxy estimates of consumption. In general, the proxy estimates do a reasonable job of capturing the consumption in their corresponding category. In total, the proxy estimates of consumption equalled 84% of the corresponding CSO figure.[16]

Figure 10: Proxy consumption coverage of National Accounts consumption

% coverage of corresponding COICOP category in the Annual National Accounts
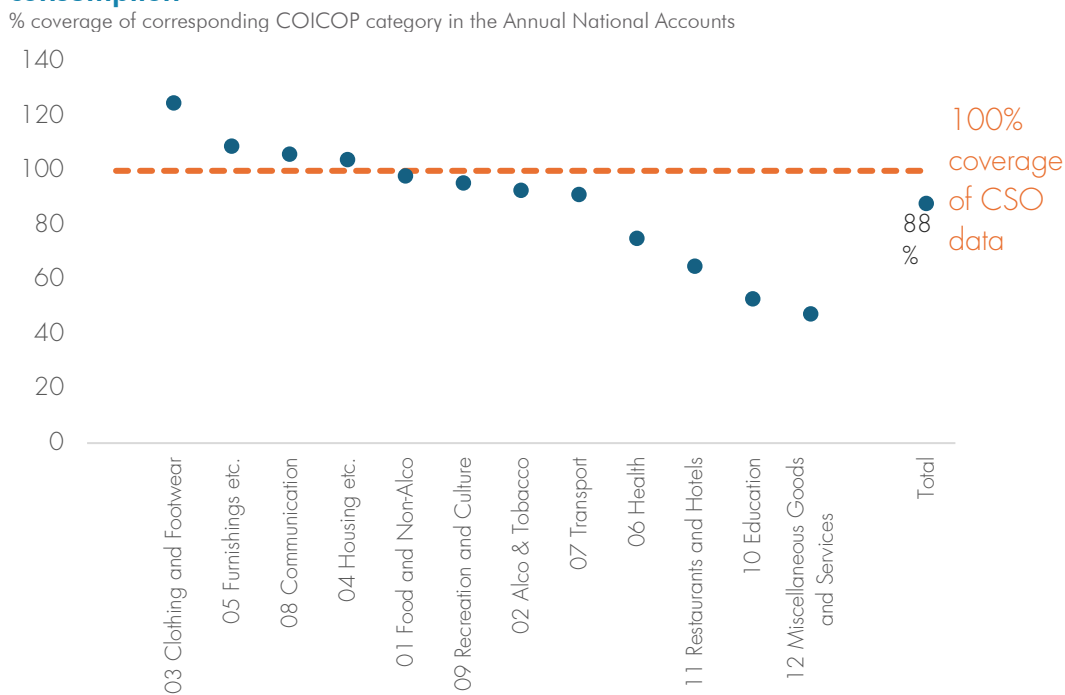
Sources: CSO and Author's workings.
Note: The figure compares the proxy consumption estimates for the period March 2023-February 2024 to those for 2023 from Table 10.1 of the Annual National Accounts. The Total figure here uses the figure called Total Expenditure of Households (National Concept) from Table 10.1 (this is equivalent to Final Consumption Expenditure of Households), as this is the most comparable to the proxy consumption estimate.

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[15] However, the data the CSO publishes on the 12 COICOP categories also includes consumption by foreign residents. This would not be captured by the proxy estimates of consumption, meaning in this instance, the proxy estimates of consumption should be lower than the corresponding CSO data.

[16] The total proxy consumption figure is compared to the CSO's estimate of Final Consumption Expenditure of Households.

Several categories are within 10% of the CSO's estimate: CP05 —Furnishings, CP08 — Communication, CP04 — Housing, Water, Electricity, Gas and Other Fuels, CP01 — Food and non-alcoholic beverages, CP09 — Recreation and culture, CP02 —Alcoholic Beverages and tobacco and CP07 — Transport.

The proxy estimate has low coverage for miscellaneous consumption of goods and services (47%) and education consumption (53%). This is unsurprising. Miscellaneous goods and services include consumption of FISIM, which is not included in the proxy estimate of consumption. FISIM falls under the heading Financial Services not Elsewhere Classified, and this represented 41% of Miscellaneous goods and services in 2023. On the education side, consumption of education services includes items like tuition fees. The coverage of these in the proxy estimate of consumption is likely to be small as these are likely to take place in the form of direct bank transfers or cash payments, and not card transactions.

The proxy estimate of consumption on restaurants and hotels is too low, capturing 65% of the value of the CSO equivalent. This may be a result of a higher proportion of cash being spent in restaurants and hotels, particularly restaurants. In addition, the CSO data for consumption of restaurants and hotels is likely to be disproportionately impacted by non-resident (tourists) expenditure.[17] Given non-resident expenditure is not included in the card data, this would result in the CSO's estimate being higher than the proxy. On the flipside, the proxy estimate of clothing and footwear is too high (125%) relative to the CSO's estimate.

Turning to the coverage of the goods and services split, Figure 11 shows the coverage of the proxy estimates relative to the CSO's estimates of goods and services consumption.[18] Once again, the proxy estimates do a reasonable job at covering both categories. The proxy estimate of goods consumption is 92% of the CSO's estimate, while the proxy estimate of services consumption is 73% of the CSO's estimate. However, this split of goods and services sums to the value of Personal Consumption Expenditure, not Final Consumption Expenditure of Household's, which the proxy estimate would be closer to. Assuming that the difference between Personal Consumption Expenditure and Final Consumption Expenditure is all services and then subtracting this from the CSO's estimate of

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[17] As total consumption should not include non-resident expenditure, the CSO subtract out this non-resident expenditure from the consumption estimates at a later point. This is clear from the CSO's figures in Table 10.1 of the Annual National Accounts.

[18] This version of the CSO's split of goods and services has electricity and gas consumption in the goods category.

services consumption, then the proxy estimate of services consumption is equal to 85% of the corresponding CSO value.[19]

Figure 11: Proxy consumption coverage of goods and services
% coverage of corresponding category in the Annual National Accounts
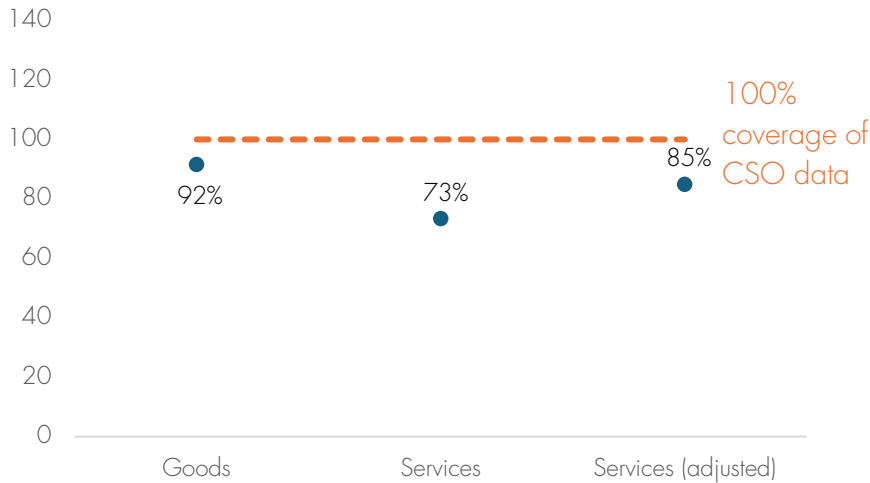
Sources: CSO and Author's workings.

4.2 Comparison with other high frequency indicators

Another natural question is how this new high frequency measure of consumption compares to other high frequency indicators of consumption. Figure 12 shows a comparison of the growth rate of the nominal proxy consumption estimate with some of the main high frequency indicators used for consumption. The raw card data shows the highest year-on-year growth rates. The VAT data also shows strong growth rates, with the proxy consumption estimate coming in slightly lower than the VAT data. Reassuringly, this is as expected as the VAT data is likely impacted positively by the increase in the VAT rate of hospitality and tourism in September 2023, and to a lesser extent, the repayment of warehoused tax receipts. In contrast, the retail sales data appears to be a significant outlier relative to the other high frequency indicators.

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[19] It is unlikely that all of the difference between Personal Consumption Expenditure and Final Consumption Expenditure of Households is actually services. However, given that most of the difference is social transfers in kind, it is safe to assume that the majority is services consumption.

Figure 12: Nominal monthly consumption indicators

% change year-on-year of the 3-month moving sum
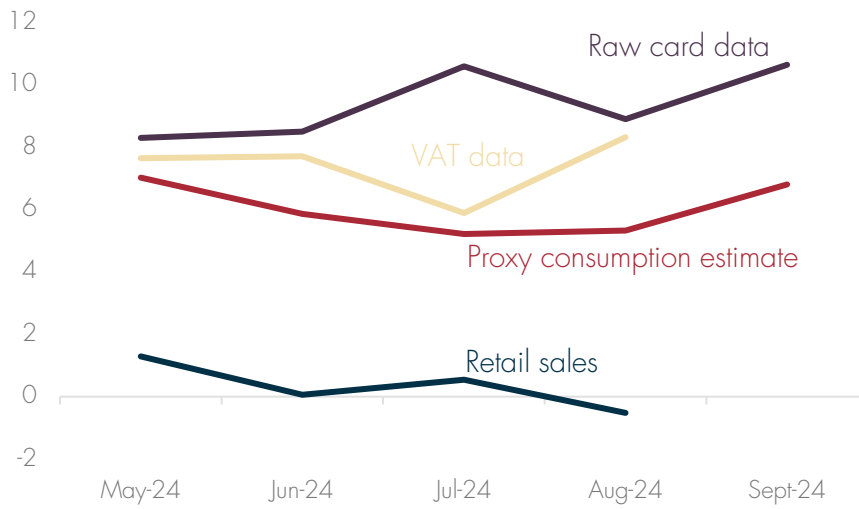
Sources: CSO; Department of Finance; Central Bank of Ireland and Author's workings.
Notes: All data is in nominal terms and based on the year-on-year growth rates of the 3-month moving sum of each variable. The retail sales index is the (unadjusted) index of all retail sales, excluding motor trades. To ensure comparability, the VAT data is adjusted backwards by one month given the timing issues related to the payment of VAT receipts.

5. Real consumption

We use two approaches to deflate the estimated consumption data. These approaches are based on the two categorisation approaches outlined above (i.e. by durability or by purpose). As a result, we produce two estimates of real consumption. Both estimates use HICP data at 2015 base prices.

Broadly speaking, the first approach deflates all 12 COICOP categories by their corresponding HICP price indices. In the case of category CP04—Housing, Water, Electricity, Gas and Other Fuels, a price index excluding rental prices is used to deflate the non-rental component.[20] For the rental component, the HICP rental price index is used as the deflator. For the non-categorisable consumption mentioned above, given these are a mix of goods and services, we have deflated this category using the aggregate HICP price index.

The second approach is based on the classification by durability. This deflates the goods category by the HICP goods index, and services (excluding rent) by a HICP index of services excluding rent. As above, rental consumption is deflated by the HICP rental price index.

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[20] This is due to the differing weights of rent in the HICP category CP04 and in the Consumption category CP04. The consumption category CP04 includes imputed rents and as a result rent gets a higher weight, whereas the HICP category does not include imputed rents.

Figure 13: Monthly real consumption estimates by category
€ billion, 2015 prices

Legend:
01 Food and Non-Alcoholic Beverages
02 Alcoholic Beverages and Tobacco
03 Clothing and Footwear
04 Housing, Water, Electricity, Gas and Other Fuels
05 Furnishings, Household Equipment
06 Health
07 Transport
08 Communication
09 Recreation and Culture
10 Education
11 Restaurants and Hotels
12 Miscellaneous Goods and Services
Non-categorizable
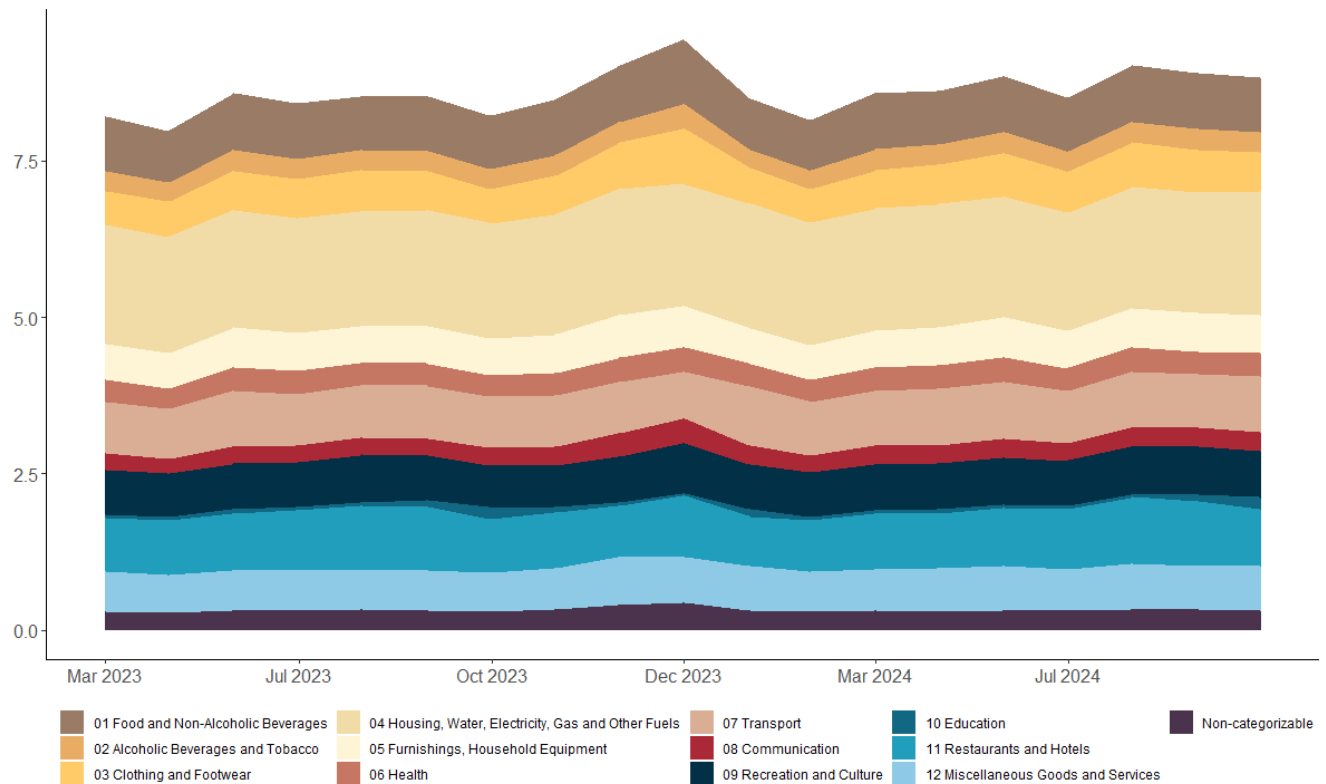
Sources: Central Bank of Ireland and Author's workings.

The estimates of consumption indicate that in recent months real growth in consumption has continued to be strong. Monthly year-on-year real growth estimates over the period March to September range from 8.1 % to 1% (Table 3). However, caution should be exercised when reading too much into monthly year-on-year estimates. These are heavily impacted by calendar fluctuations, like the timing of Easter and the number of weekends in the month, which can vary from year to year. There are typically different spending patterns on weekends and bank holidays, and payment transactions are unlikely to be processed over these periods.[21] Given the small number of days in a given month, this can have a large impact on monthly year-on-year growth rates.

As a result, looking at the data over a longer time period, say 3 months, is likely to provide a more accurate reflection of the trends in consumption. In this instance, the year-on-year growth rates of the 3-month rolling sum of real consumption ranges from 3.4% to 6% over the same period. The figure for August 2024 shows a real year-on-year growth rate of between 3.7% and 3.9%. In contrast, the August data for the retail sales index show real growth rates ranging from −2.5 to

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[21] The implementation of the SEPA instant payments regulation in the near future may alleviate some of the issues relating to timing and processing of payments.

−1.5%. The most recent consumption estimate for September 2024 of between 5.8% and 6% indicates strong year-on-year growth in the 3rd quarter of the year, partly reflecting base effects, with very weak consumption in the 3rd quarter of 2023.

Table 3: Growth rates of raw card data and proxy consumption estimates
Growth rates, year-on-year

	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24
Raw data: Card spending and ATM withdrawals (nominal)	9.8	13.6	8.6	4.9	11.3	9.4	11.3
Nominal proxy consumption	6.4	9.6	5.2	3.0	7.4	5.5	7.5
Real proxy consumption (COICOP deflated)	4.6	8.1	3.3	1.0	5.8	4.4	7.4
Real proxy consumption (Goods & Services deflated)	4.7	8.0	3.2	1.1	5.9	4.5	7.6
Real proxy services consumption	3.0	5.7	2.9	1.4	3.7	3.2	5.3
Real proxy goods consumption	6.4	10.3	3.5	0.9	8.1	5.6	9.8
Raw data: Card spending and ATM withdrawals (nominal) (3mms)			10.6	8.9	8.3	8.5	10.6
Nominal proxy consumption (3mms)			7.0	5.9	5.2	5.3	6.8
Real proxy consumption (COICOP deflated) (3mms)			5.3	4.0	3.4	3.7	5.8
Real proxy consumption (Goods & Services deflated) (3mms)			5.3	4.1	3.4	3.9	6.0
Real proxy services consumption (3mms)			3.9	3.3	2.7	2.8	4.1
Real proxy goods consumption (3mms)			6.6	4.7	4.2	4.9	7.8

Sources: Central Bank of Ireland; Author's workings.
Notes: "3mms" stands for the 3-month moving sum.

5.1 Sources of measurement error for real consumption

As mentioned earlier in relation to the nominal estimates, the assumptions around cash spending are likely to be one of the largest sources of measurement error. The distribution of cash spending across consumption and non-consumption may not be the same as that of the point-of-sale transaction data. If the assumptions around the distribution of cash spending across COICOP codes are not correct, the wrong deflator may be applied.

Measurement error on for real consumption is also likely to come from areas that involve multiple categories or Merchant Category codes — like supermarkets and department stores. As the allocation of this consumption across COICOP codes is based on Spanish data, it may not be appropriate in the Irish context. This once again, may result in the wrong deflator being applied to the wrong consumption.

More generally, measurement error for real consumption will arise if the nominal estimate of consumption does not capture an appropriate share of all items in each category. For instance, if the nominal estimate of goods consumption has

too low a share of energy products relative to the share of energy in the price series for goods consumption, this may result in the estimates being in appropriately deflated. This issue is likely to be less of an issue when the deflation is carried out at a more disaggregated level, as is the case with the 12 category COICOP estimate (Figure 13).

6. Conclusions

This paper uses granular information from the Central Bank's card payment statistics to estimate monthly consumption. This data allows for a detailed decomposition of monthly consumption across COICOP codes that is not available from other sources. The estimates of consumption using this approach show a reasonable degree of coverage relative to the CSO's official data for consumption. Using this data, we find that real household consumption in 2024 continues to be strong, with year-on-year growth rates of close to 6% in the third quarter, stronger than other high frequency indicators suggest.

The short time series of available data limits a lot of the analysis that could be carried out. Over time, as more data becomes available, it will be possible to evaluate how accurate the proxy estimate of consumption is relative to the Annual National Accounts estimate of consumption. With more data, it will be possible to produce seasonally adjusted estimates of this proxy consumption estimate which will provide a better indication of the trends in consumption throughout the year.

Furthermore, there are potential improvements than can be made to some of the process in estimating this proxy consumption estimate. For instance, if better data sources became available for the consumption spending which takes place using direct debits, this could significantly improve the proxy consumption estimate. Like all indicators, this estimate is imperfect. However, it does represent an improvement on many of the existing high frequency indicators of consumption.

References

Buda, G., Hansen, S., Rodrigo, T., Carvalho, V.M., Ortiz, Á., and Rodriguez Mora, J.V., (2022). National Accounts in a World of Naturally Occurring Data: A Proof of Concept for Consumption. Cambridge Working Papers in Economics No. 2244. Available at: https://www.repository.cam.ac.uk/bitstreams/43cedc52-a47e-49c5-b892-9dbf4fcde7bc/download

Byrne, S., Hopkins, A., McIndoe-Calder, T., and M. Sherman (2020). "The impact of Covid-19 on consumer spending" Economic Letter, Vol. 2020, No 15. Available at: https://www.centralbank.ie/docs/defaultsource/publications/economic-letters/the-impact-of-covid-19-onconsumer-spending.pdf

Cholette, P.-A. (1984). Adjusting sub-annual series to yearly benchmarks. Survey Methodology 10(1), 35–49.

Fiscal Council (2023). Fiscal Assessment Report December 2023, Box B: Revisions to Irish consumption data. Irish Fiscal Advisory Council. Available at: https://www.fiscalcouncil.ie/wp-content/uploads/2023/12/Box-B-Revisions-to-Irish-consumption-data.pdf

FitzGerald, J. (2016). Problems with the Irish National Accounts and Possible Solutions. Economic Statistics Review Group Discussion Paper. December 2016. Available at: https://www.cso.ie/en/csolatestnews/eventsconferencesseminars/resrg/

FitzGerald, J. (2020). Understanding recent trends in the Irish economy. Economic and Social Research Institute, Special Article in Quarterly Economic Commentary Summer 2020. Available at: https://www.esri.ie/system/files/publications/QEC2020SUM_SA_FitzGerald.pdf

Honohan, P. (2016). Towards a trimmed-GDP concept. Economic Statistics Review Group Discussion Paper. November 2016. Available at: https://www.cso.ie/en/csolatestnews/eventsconferencesseminars/resrg/

Timoney, K. (2022). Household consumption and savings in Ireland since the Covid-19 pandemic. Irish Fiscal Advisory Council. Analytical Note No. 18. November 2022. Available at: https://www.fiscalcouncil.ie/wp-content/uploads/2022/11/Household-Consumption-and-Savings-in-Ireland-Since-the-Covid-19-Pandemic-Fiscal-Council-Analytical-Note-18-by-Kevin-Timoney.pdf

United Nations (2018). Classification of Individual Consumption According to Purpose (COICOP) 2018. United Nations, Department of Economics and Social Affairs, Statistics Division. Series M, No.99. New York. Available at: https://unstats.un.org/unsd/classifications/unsdclassifications/COICOP_2018_-_pre-edited_white_cover_version_-_2018-12-26.pdf

Appendix A: Mapping of Merchant Category Codes to COICOP categories

MCC	COICOP category	Goods or service	MCC	COICOP category	Goods or service
742	9	S	4899	8	S
743	2	G	4900	4	G
744	2	G	5013	7	G
763	Non-consumption	Non-consumption	5021	5	G
780	5	S	5039	Non-consumption	Non-consumption
1353	Supermarket	G	5044	9	G
1406	3	G	5045	9	G
1520	Building	Non-consumption	5046	Non-categorizable	G
1711	Building	Non-consumption	5047	6	G
1731	Building	Non-consumption	5051	Non-consumption	Non-consumption
1740	Building	Non-consumption	5065	Non-consumption	Non-consumption
1750	Building	Non-consumption	5072	Non-consumption	Non-consumption
1761	Building	Non-consumption	5074	Non-consumption	Non-consumption
1771	Building	Non-consumption	5085	Non-consumption	Non-consumption
1799	Building	Non-consumption	5094	12	G
2741	9	S	5099	Non-categorizable	G
2791	9	S	5111	9	G
2842	4	S	5122	6	G
4011	7	S	5131	3	G
4111	7	S	5137	3	G
4112	7	S	5139	3	G
4119	6	S	5169	Non-consumption	Non-consumption
4121	7	S	5172	7	G
4131	7	S	5192	9	G
4214	7	S	5193	9	G
4215	7	S	5198	4	G
4225	4	S	5199	Non-categorizable	G
4411	7	S	5200	5	G
4457	7	S	5211	Building	Non-consumption
4468	7	S	5231	4	G
4511	7	S	5251	4	G
4582	7	S	5261	5	G
4722	9	S	5262	Supermarket	G
4723	9	S	5271	Non-consumption	Non-consumption
4784	7	S	5299	7	G
4789	7	S	5300	Non-categorizable	G
4812	8	G	5309	Non-categorizable	G
4813	8	S	5310	Non-categorizable	G
4814	8	S	5311	Supercenter	G
4815	8	S	5331	Supermarket	G
4816	8	S	5333	Supermarket	G
4821	8	S	5399	Non-categorizable	G
4829	Non-consumption	Non-consumption	5411	Supermarket	G

MCC	COICOP category	Goods or service	MCC	COICOP category	Goods or service
5422	1	G	5812	11	S
5441	1	G	5813	11	S
5451	1	G	5814	11	S
5462	1	G	5815	9	G
5499	Supermarket	G	5816	9	G
5511	7	G	5817	9	G
5521	7	G	5818	9	G
5531	5	G	5912	6	G
5532	7	G	5921	2	G
5533	7	G	5931	Non-categorizable	G
5541	7	G	5932	Non-categorizable	G
5542	7	G	5933	Non-consumption	Non-consumption
5551	7	G	5935	Non-consumption	Non-consumption
5552	7	G	5937	Non-categorizable	G
5561	7	G	5940	7	G
5571	7	G	5941	9	G
5592	7	G	5942	9	G
5598	7	G	5943	9	G
5599	7	G	5944	12	G
5611	3	G	5945	9	G
5621	3	G	5946	9	G
5631	3	G	5947	Non-categorizable	G
5641	3	G	5948	12	G
5651	3	G	5949	3	G
5655	4	G	5950	5	G
5661	3	G	5960	12	S
5681	3	G	5961	Non-categorizable	G
5691	3	G	5962	9	S
5697	3	S	5963	Non-categorizable	G
5698	12	G	5964	Non-categorizable	G
5699	3	G	5965	Non-categorizable	G
5712	5	G	5966	Non-categorizable	G
5713	5	G	5967	Non-categorizable	G
5714	5	G	5968	Non-categorizable	G
5715	2	G	5969	Non-categorizable	G
5718	5	G	5970	9	G
5719	5	G	5971	9	S
5722	5	G	5972	9	G
5732	8	G	5973	12	G
5733	9	G	5974	8	G
5734	8	G	5975	6	G
5735	9	G	5976	6	G
5811	11	S	5977	12	G

MCC	COICOP category	Goods or service	MCC	COICOP category	Goods or service
5978	8	G	7261	12	S
5983	4	G	7273	12	S
5992	9	G	7276	12	S
5993	2	G	7277	12	S
5994	9	G	7278	Non-categorizable	S
5995	9	G	7280	6	S
5996	5	G	7295	12	S
5997	12	G	7296	3	S
5998	9	G	7297	12	S
5999	Non-categorizable	G	7298	12	S
6010	Non-consumption	Non-consumption	7299	12	S
6011	Non-consumption	Non-consumption	7311	12	S
6012	Non-consumption	Non-consumption	7321	12	S
6050	Non-consumption	Non-consumption	7322	Non-consumption	Non-consumption
6051	Non-consumption	Non-consumption	7332	9	S
6211	Non-consumption	Non-consumption	7333	9	G
6300	12	S	7338	12	S
6381	12	S	7339	12	S
6399	12	S	7342	12	S
6513	Non-consumption	Non-consumption	7349	4	S
6529	Non-consumption	Non-consumption	7361	12	S
6530	Non-consumption	Non-consumption	7372	12	S
6532	Non-consumption	Non-consumption	7375	12	S
6533	Non-consumption	Non-consumption	7379	8	S
6535	Non-consumption	Non-consumption	7392	12	S
6536	Non-consumption	Non-consumption	7393	12	S
6537	Non-consumption	Non-consumption	7394	5	S
6538	Non-consumption	Non-consumption	7395	9	S
6539	Non-consumption	Non-consumption	7399	Non-categorizable	S
6540	Non-consumption	Non-consumption	7511	7	S
6611	Non-consumption	Non-consumption	7512	7	S
6760	Non-consumption	Non-consumption	7513	7	S
7011	11	S	7519	7	S
7012	11	S	7523	7	S
7032	11	S	7524	7	S
7033	11	S	7531	7	S
7210	3	S	7534	7	S
7211	3	S	7535	7	S
7216	3	S	7538	7	S
7217	5	S	7539	7	S
7221	9	G	7542	7	S
7230	12	S	7549	7	S
7251	3	S	7622	8	S

MCC	COICOP category	Goods or service	MCC	COICOP category	Goods or service
7623	5	S	8241	10	S
7629	5	S	8244	10	S
7631	12	S	8249	10	S
7641	5	S	8299	10	S
7692	4	S	8351	12	S
7699	Non-categorizable	S	8398	Non-consumption	Non-consumption
7800	9	S	8641	Non-consumption	Non-consumption
7801	9	S	8651	12	S
7802	9	S	8661	12	S
7829	9	S	8675	12	S
7832	9	S	8699	Non-categorizable	S
7833	9	S	8734	6	S
7841	9	S	8911	Building	Non-consumption
7911	9	S	8931	12	S
7922	9	S	8999	Non-categorizable	S
7929	9	S	9034	Non-consumption	Non-consumption
7932	9	S	9211	12	S
7933	9	S	9222	Non-consumption	Non-consumption
7941	9	S	9223	Non-consumption	Non-consumption
7991	9	S	9311	Non-consumption	Non-consumption
7992	9	S	9399	12	S
7993	9	G	9402	8	S
7994	9	S	9405	Non-consumption	Non-consumption
7995	9	S	9406	9	S
7996	9	S	9700	12	S
7997	9	S	9701	Non-consumption	Non-consumption
7998	9	S	9702	6	S
7999	11	S	9751	Supermarket	G
8011	6	S	9752	7	G
8021	6	S	9754	9	S
8031	6	S	9950	Non-consumption	Non-consumption
8041	6	S	G300	7	S
8042	6	S	G335	7	S
8043	6	S	G350	11	S
8044	6	G	R999	Temp	Temp
8049	6	S			
8050	6	S			
8062	6	S			
8071	6	S			
8099	6	S			
8111	12	S			
8211	10	S			
8220	10	S			

Appendix B: Scaling up utilities spending

This appendix provides suggestive evidence on the appropriateness of scaling up the card data for Utilities spending.

Two Merchant Category Codes are relevant for utilities: 4900—Utilities, and 5983—Fuel Dealers (Non-Automotive). For 2023, these two categories sum to €1.3 billion whereas the corresponding consumption category in the National Accounts, suggested that there was €7.3 billion of nominal consumption in 2023.

For home heating oil (kerosene), monthly data on deliveries is available from the SEAI.[22] Perhaps unsurprisingly, the trends from this data closely matches those of the real monthly spend on home heating oil from the card transaction data, Merchant Category 5983— Fuel Dealers (Non-Automotive) (Figure B1).

The consumption of residential gas is likely to follow similar seasonal patterns as home heating oil. Data for the volume of daily metered gas consumption is available from the CSO.[23] Unfortunately, this data does not distinguish between residential consumption and gas consumed by other small business premises. [24] Comparing this data to the monthly real spend on home heating oil, shows a broadly similar trend to the volume of gas consumption by smaller premises. This suggests that this Merchant Category could be a reasonable proxy for both home heating oil and domestic gas consumption.

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[22] Data available here: https://www.seai.ie/data-and-insights/seai-statistics/monthly-energy-data/oil-monthly.

[23] This is available here: https://data.cso.ie/table/GNC01.

[24] This category includes all small premises like residential properties and business with low (annual consumption of less than 5.55 GWh) gas consumption.

Figure B1: The trends in home heating oil consumption broadly match gas consumption

Gwh, heating oil

€ million, Dec 2023=100, MCC= 5983
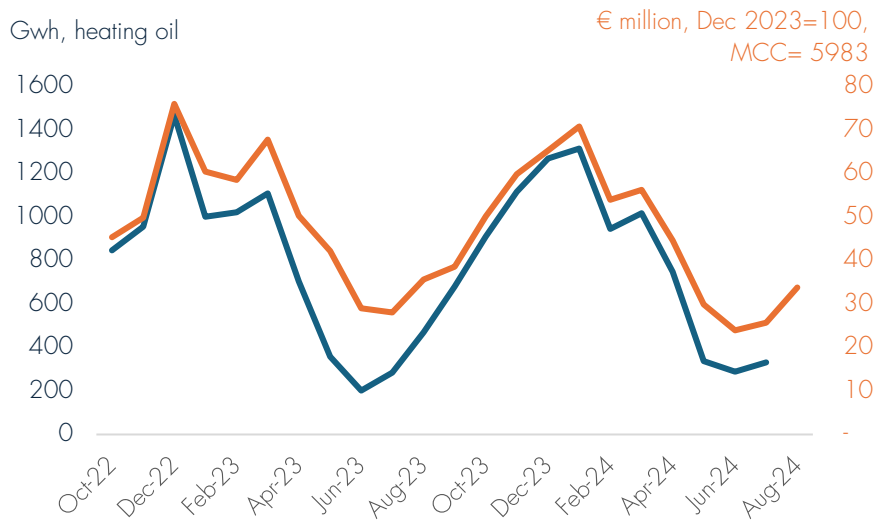
Sources: CBI; SEAI and authors' workings.
Notes: Figure shows the monthly home heating oil (kerosene) (LHS) purchases, versus the real monthly spend on Merchant Category Code 5983— Fuel Dealers (Non-Automotive). The monthly spend is deflated using the CPI index for liquid fuels.

Figure B2: The trends in home heating oil consumption broadly match gas consumption

Gwh, gas

€ million, Dec 2023=100, MCC= 5983
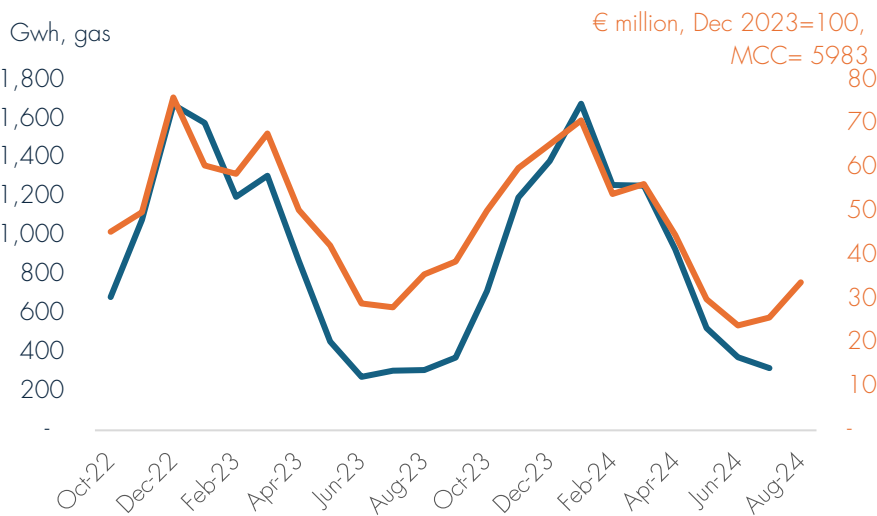
Sources: CBI; CSO and authors' workings.
Notes: Figure shows the monthly networked gas consumption (LHS) for premises with annual consumption under 5.55 GWh, versus the real monthly spend on Merchant Category Code 5983— Fuel Dealers (Non-Automotive). The monthly spend is deflated using the CPI index for liquid fuels.

Unfortunately, there is no monthly data on the volume of residential consumption of electricity. However, as a proxy, we can use the monthly electricity generation data produced by the SEAI.[25] This data includes not only electricity generated to

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[25] This data is available here: https://www.seai.ie/data-and-insights/seai-statistics/monthly-energy-data/electricity-monthly.

supply households, but also all businesses including data centres and large industrial manufacturing plants.

In Figure B3, the volume of home heating oil, is combined with the volume of metered gas consumption of small premises, and the volume of monthly electricity generation. All data is expressed in Gigawatt hours. Combining this data in this manner is unlikely to be wholly appropriate as a significant proportion of the electricity estimate is not related to household consumption.[26] However, it can still provide some suggestive evidence.

Figure B3: The trends gas and electricity consumption broadly match those in Utilities and Fuel consumption
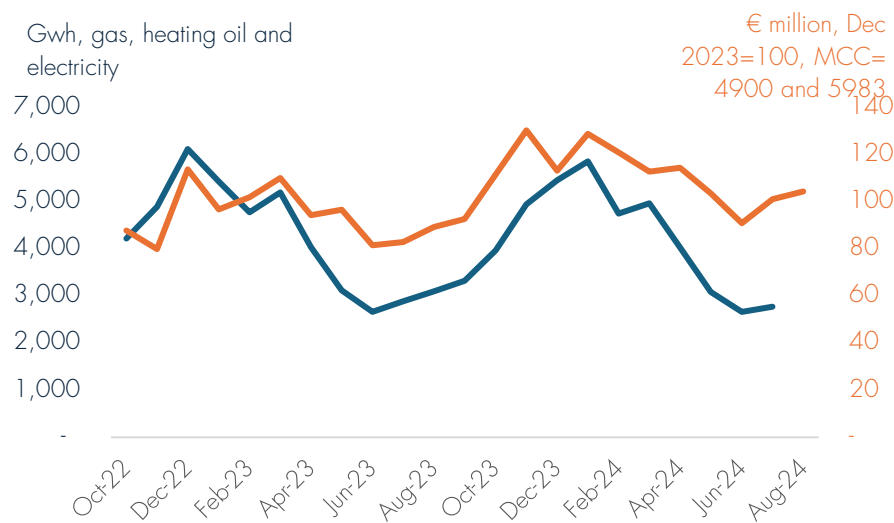
Sources: CBI; CSO; SEAI and authors' workings.
Notes: Figure shows the monthly networked gas consumption (LHS) for premises with annual consumption under 5.55 GWh, versus the real monthly spend on Merchant Category Code 5983 and 4900. The monthly spend on Merchant Category Code 5983 is deflated using the CPI index for liquid fuels. The monthly spend on Merchant Category Code 4900 is deflated using the CPI index for electricity.

This volume of energy is shown alongside the two utility Merchant Category codes together (4900 and 5983) in Figure B3. The monthly real consumption spending patterns on these utilities are broadly similar to the volume home heating oil and gas consumed, and the volume of electricity generated. Albeit the volume of energy data is smoother than the card payment data.

Given this suggestive evidence of similar patterns between the volume of gas and electricity consumption and the data from the card payment statistics, we have scaled up the nominal estimates by a factor of 5.7 so that the sum of the two Merchant Category codes equals the official annual data published by the CSO.

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[26] Similarly, the prices for each product differ, so they may not have an appropriate weight.

As a comparison, Table B1 shows the growth rates of the proxy consumption estimate that would arise if the estimates of utilities from the card data were not rescaled.

Table B1: Growth Proxy consumption estimates without rescaling Utilities spending
Growth rates, year-on-year

	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24
Raw data: Card spending and ATM withdrawals (nominal)	9.8	13.6	8.6	4.9	3.5	9.4	11.3
Nominal proxy consumption	7.2	9.6	5.6	3.2	7.4	5.8	7.4
Real proxy consumption (COICOP deflated)	4.5	7.4	3.0	0.7	5.3	4.0	6.7
Real proxy consumption (Goods & Services deflated)	5.4	7.8	3.5	1.2	5.8	4.6	7.3
Real proxy services consumption	3.0	5.7	2.9	1.4	3.7	3.2	5.3
Real proxy goods consumption	8.0	10.1	4.0	1.0	8.1	6.1	9.4
Raw data: Card spending and ATM withdrawals (nominal) (3mms)			8.3	8.5	10.6	8.9	10.6
Nominal proxy consumption (3mms)			7.4	6.0	5.4	5.5	6.9
Real proxy consumption (COICOP deflated) (3mms)			4.9	3.6	3.0	3.3	5.3
Real proxy consumption (Goods & Services deflated) (3mms)			5.5	4.1	3.5	3.9	5.9
Real proxy services consumption (3mms)			3.9	3.3	2.7	2.8	4.1
Real proxy goods consumption (3mms)			7.3	4.9	4.4	5.1	7.8

Sources: Central Bank of Ireland; Author's workings.
Notes: "3mms" stands for the 3-month moving sum.

Appendix C: Difference between old merchant category code data and new merchant category code data

The sum of the point-of-sale card transactions and the online sale transactions in the Merchant category code dataset on the Central Bank's Open data portal no longer equal the data published in the spreadsheet. In previous versions of the card data, this was not the case—the sum of the transactions across Merchant Category Codes on the Open data portal did equal the data published in the spreadsheet. This recent change is due to confidentiality reasons. However, over the period March 2023 to June 2024, the discrepancy averaged only €10.9 million per month.

Given that this data was previously published with associated Merchant Category Codes, it is possible to do a decomposition on the discrepancy over the period March 2023 to June 2024. Most of this missing data would have been categorised as non-consumption as it related either to financial transactions or purchases of building materials. On average over the period March 2023 to June 2024, 86% of this discrepancy each month would have been classified as non-consumption.

As there is now no longer an associated Merchant Category Code for this transaction, it is no longer possible to classify this into COICOP categories. Given that this historical monthly amounts of consumption from this source would be equal to approximately €1.5 million, or 0.02% of monthly consumption, we have decided to treat all the discrepancy as non-consumption going forward. Should this discrepancy increase substantially in size relative to the rest of the data, we will review this classification.