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ATM Cash Withdrawals Before, During and After the Covid-19 Pandemic

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This *Letter* quantifies how ATM cash withdrawals in Ireland have been affected by the Covid-19 pandemic. We find: (i) that there was a one-off downward step shift in monthly ATM withdrawals in spring 2020, with withdrawals moving in a narrow range subsequently; (ii) withdrawals have been sensitive to the degree of government policy stringency in relation to public health; (iii) against the background of the recent pickup in inflation, the nominal value of cash withdrawals is increasing in line with higher consumer prices.

1. Introduction

The Covid-19 pandemic saw a partial shift from making payments with cash to undertaking them with cards and other means, which in part reflects a move to on-line shopping (see Byrne *et al*., 2020, for discussion of this for Ireland). Point-of-sale payments made by debit cards in Ireland rose from €3.4 billion in February 2020 to €4.9 billion in the corresponding month of 2022.[2] Many card payments are now "contactless" in nature, a feature that allows them to be used for small-value payments that were previously mainly the preserve of banknotes and coin.

Cash, nevertheless, remains a widely-used payment instrument in Ireland and throughout Europe. A recent survey (Department of Finance, 2022), based on interviews conducted between February and April 2022, found that one in five Irish adults prefer to pay in cash in stores and the average claimed proportion of in-store spending conducted through cash is 31 per cent. The appeal of cash, relative to cards, arises, among other attributes, from its protecting the privacy of its holder, its allowing money balances to be held in person, as opposed to in a bank account, and its benefits in budgeting by assisting an easy tracking of expenditure and in the avoidance of overspending.

Across Europe, there has historically been considerable variation in cash usage in payments (and, indeed, in the extent to which other payment instruments, such as cheques and direct debits, are used) that continues today (see Cronin and McGuinness, 2010, and Cronin, 2021, for surveys, and Cronin and McInerney, 2022, for evidence for Ireland). While Scandinavian countries now see a low proportion of payments made in cash, banknotes and coin remain heavily used in many EU countries. For instance, a payment diary survey conducted by Oesterreichsche Nationalbank between September 2020 and April 2021 indicates that two-

[1] The views expressed here are those of the authors and do not necessarily represent those of the Central Bank of Ireland or the European System of Central Banks. The authors would like to thank colleagues for their comments and suggestions.

[2] Source: https://www.centralbank.ie/statistics/data-and-analysis/credit-and-debit-card-statistics

thirds of all point-of-sale transactions, and four-fifths of payments of €10 or less, in Austria were conducted in cash during that period (Hopperger and Ragu, 2021).

Within countries, a marked difference between cash and card users is becoming apparent. Based on survey data compiled during the pandemic across 22 European countries, Kotkowski and Polasik (2021) find a divide among consumers between those who favour cashless payments and those who retain a strong preference for cash payments. In Ireland, heavier usage of cash in payments is made by older age groups, the C2DE social class, and those living in rural areas (Department of Finance, 2022).[3]

As well as acting as a means of payment, cash is also a store of value and the onset of the pandemic in spring 2020 saw a greater demand for cash to hoard internationally. Goodhart and Ashworth (2020) find cash in circulation surged in the United States, the euro area and several other countries at the outset of the pandemic. Such a development often occurs in response to marked rises in economic and political uncertainty but such an additional stock of cash can be run down, including through use in undertaking expenditure, when such uncertainty subsides.[4] [5]

In Ireland, the primary means of withdrawing banknotes is ATMs.[6] In this *Letter*, we examine how monthly total ATM cash withdrawals – both by value and volume - have behaved in Ireland since 2015. Monthly banknote withdrawals at ATMs underwent a one-off structural shift in their average value at the outset of the pandemic and remained steady thereafter. Consequently, while there has been a rise in card payments in recent years, a steady demand for ATM cash transactions remains in place. The *Letter* also shows that withdrawals have been sensitive to the stringency of government policy actions in response to the pandemic with less stringency being associated with higher ATM withdrawals. The nominal value of ATM cash withdrawals appears to be responding to higher inflation rates since the autumn of last year, with the amount withdrawn in June 2022 being seven per cent higher than in September 2021, on a seasonally-adjusted basis, while the Consumer Price Index rose by the same percentage value in that period.

[3] The Department of Finance's survey distinguishes social class into two categories: ABC1F and C2DE. While not specifically defined within the document, the former category is associated with employers, managers, professionals, and semi-skilled. The latter category is associated with professionals, non-manual and manual skilled. Professionals are then distinguished into two sub-classes: C1 and C2.

[4] Ashworth and Goodhart (2020) also document a spike in currency demand in several countries at the peak of the 2008 financial crisis.

[5] Cash can also be moved across national borders. As a small member state with no land border to another euro area country, the issuance of notes and coin in Ireland will not be as affected as in other states by remittances of cash, tourism or wholesale movements of cash across borders.

[6] Department of Finance (2022) indicates 73 per cent of Irish adults use ATMs regularly.

2. ATM Data

We examine monthly ATM cash withdrawals by value and by the number (volume) of ATM cash transactions in Ireland from January 2015 to June 2022, a sample of 90 months.[7] Two adjustments are made to the series. First, there is a clear seasonal pattern to the data that is most noticeable around the turn of the year, with a large jump in withdrawals in December followed by a pronounced decline in January. Accordingly, the X13 seasonal adjustment procedure is applied to the series; undertaking such an adjustment makes it easier to see any changes in mean or trend values.[8] Secondly, the seasonally-adjusted value series is further adjusted to account for changes in the price level, as measured by the Consumer Price Index (also seasonally adjusted using the X13 procedure), over time.[9] Both the nominal and real, seasonally-adjusted (SA) value series are plotted, respectively, in panels (i) and (ii) of Figure 1. The vertical line in both panels (and in Figure 2) signifies April 2020, the first full month of lockdown in Ireland in response to the Covid-19 pandemic.

Visual inspection of the two series indicates that ATM withdrawals were broadly unchanging prior to the pandemic with average monthly withdrawals of €1.51 billion per month over the period January 2015 to February 2020. A severe lockdown then prevailed in Ireland between mid-March 2020 and May 2020 and ATM withdrawals fell substantially. Thereafter, monthly ATM withdrawals have moved in a relatively narrow range with an average value of €1.04 billion over the 25 months from June 2020 to June 2022.[10] Monthly nominal withdrawals, as seen in panel (i) of Figure 1, rose during late 2021 and 2022 but the real series in panel (ii) shows little change in that period, suggesting that increased nominal withdrawals reflect users' cash needs responding to inflationary developments in a positive manner. Year-on-year inflation rates, as measured by the CPI, started to rise above 5 per cent in autumn 2021. ATM cash withdrawals, by nominal value and on a seasonally-adjusted basis, were seven per cent higher in June 2022 compared to September 2021, while the Consumer Price Index rose by the same percentage value in that period.

As well as the value of ATM withdrawals, the number of ATM cash transactions is also available on a monthly basis from January 2015 to June 2022. This volume series is plotted, on a seasonally-adjusted (SA) basis, in Figure 2. The fall in the volume of ATM transactions in spring 2020 is larger than that in the value series, shown in panel (i) of Figure 1. This is

[7] Both the value and volume ATM series are sourced from https://www.centralbank.ie/statistics/data-and-analysis/credit-and-debit-card-statistics. Values of ATM withdrawals outside of Ireland are subtracted from the headline values to give the measure of ATM withdrawals within Ireland used here. There is no breakdown between ATM withdrawal volumes in Ireland and abroad. The data are available on a monthly basis from January 2015.

[8] In applying the X13 procedure, we also considered allowing for a level shift in the series in March 2020. Such an application rendered series that are similar to those where the procedure is applied without such a shift. There is negligible difference between using each series in the econometric analysis below.

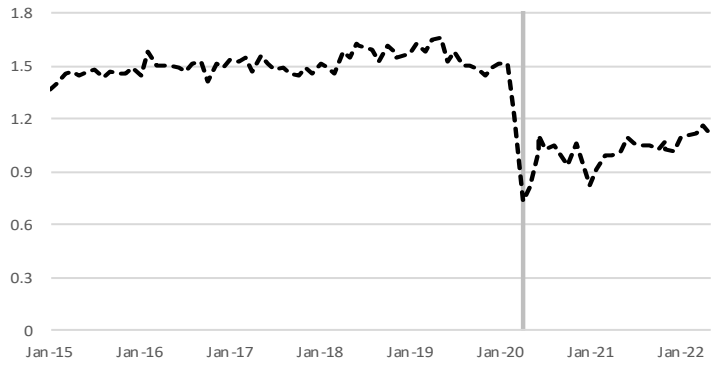
[9] The CPI series is sourced from https://data.cso.ie/#. The index has a value of 100 in 2016.

[10] ATM withdrawals did fall sharply in January 2021, when fresh restrictions were imposed, before recovering thereafter.

because while fewer withdrawals occurred each month after spring 2020, the average amounts withdrawn were higher. In the twelve months prior to March 2020, the average withdrawal amount moved in a range of €130 to €135, except for December 2019 when it was €145. Between June 2020 and May 2021, the average monthly range was €148 to €161. Figure 2 also shows how the number of monthly ATM withdrawals has been rising since January 2021. In that month, there were 5.23 million withdrawals, on a seasonally-adjusted basis, while the number in June 2022 was 7.95 million, close to two thirds of the pre-pandemic average.

Figure 1. Monthly ATM withdrawals, by value, January 2015-June 2022

(i) ATM withdrawals, SA, €bn.



(ii) ATM withdrawals, real, SA, €bn.

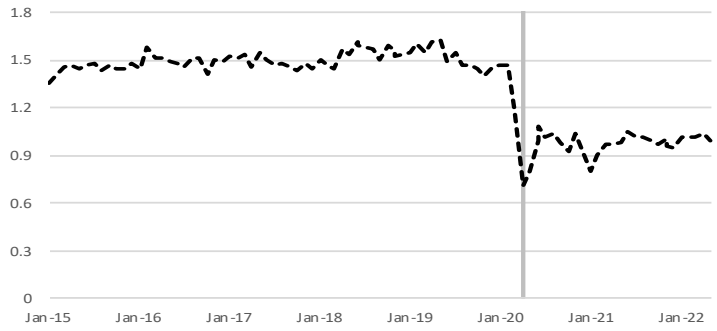
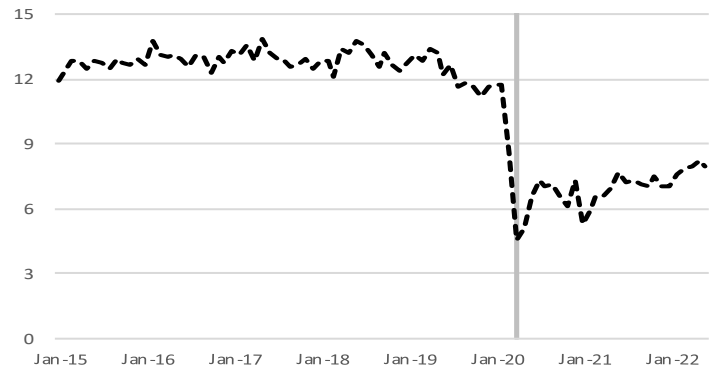


Figure 2. Monthly ATM transactions (mn.s), SA, January 2015-June 2022



The visual analysis of the series above points to structural changes in the monthly real ATM withdrawal value and volume series occurring in the first quarter of 2020. Formal structural tests indicate that a break in both the real value series (denoted *RATMVal*) and volume series (denoted *ATMVol*) occurred in March 2020 (these results are available on request from the authors). Regression analysis (again available from the authors on request) shows a structural shift in the mean of both series occurring in that month.

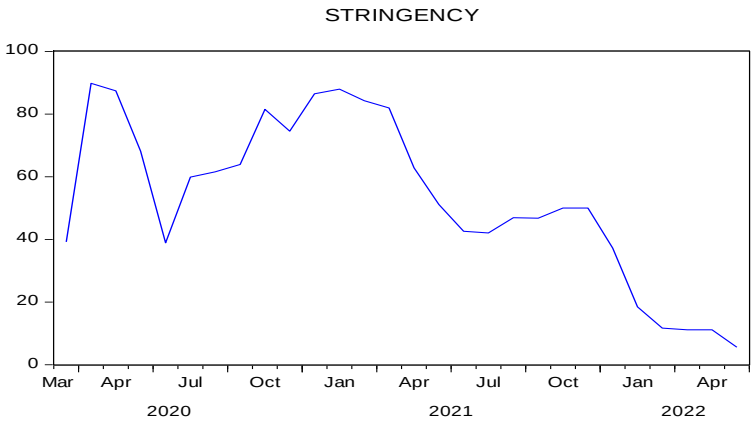
3. A Model of ATM Withdrawals

The onset of the pandemic in March 2020 coincided with a structural shift in the mean of monthly cash withdrawals from ATMs, both by value and by volume. Notwithstanding this change, it is possible that monthly withdrawals subsequently fluctuated around their new mean values in response to variations in the stringency of the public policies aimed at containing the spread of Covid-19. Greater stringency led to less economic activity, particularly in physical locations where cash is used, and so less ATM activity would be expected in such circumstances.

This section then quantifies the structural shift that occurred in March 2020 and how changes in the restrictiveness of Covid-19 policies affected the value and volume of cash withdrawals thereafter. A dummy variable, $DVMAR2020$, is used, with a value of zero before March 2020 (January 2015 to February 2020) and a value of one from March 2020 to June 2022, to capture the structural shift in the mean in March 2020. Restrictiveness is captured by the "Covid-19 Government Response Stringency Index" ($Stringency\_Index$) constructed by Hale *et al.* (2020), which varies in a range of 0 to 100 with higher values indicating greater stringency.[11] Figure 3 shows the value of the index for Ireland from March 2020 to June 2022. The index rose rapidly in April and May 2020, reaching a peak of 90.7 during that period before restrictions were eased in June and July. The restrictiveness of pandemic-related policies began to increase again in August, reaching a similar level of stringency to what arose at the onset of the pandemic in January and February 2021. The index fell gradually during the spring and summer of 2021, before rising again slightly over the winter months. Most restrictions were removed in January 2022 and the index dropped to an average value of 11.11 between March and May, before falling to its lowest value of 5.56 in June.

[11] The index is a composite of several indicators capturing governments' response to the Covid-19 pandemic including policies relating to school and workplaces closures, travel restrictions, and social distancing. Greater stringency reflects, for example, the closure if schools and workplaces. See Hale *et al.* (2020) for details on the construction of the index.

Figure 3. Covid-19 Government Response Stringency Index



Source: OxCGRT[12]

To quantify the impact of the government lockdown measures on the value and volume of ATM cash withdrawals and the structural shift in both series in March 2020, the following regressions are specified:[13]

$$RATMVal_t = \alpha + \gamma_1 DVMAR2020 + \gamma_2 Stringency_{Index} + \varepsilon_t \quad (1)$$

And

$$ATMVol_t = \alpha + \gamma_1 DVMAR2020 + \gamma_2 Stringency\_Index + \varepsilon_t \quad (2)$$

The estimations results for (1) and (2) are shown in columns (i) and (ii) of Table 1, respectively. The coefficient on $DVMAR2020$ is of the opposite sign to the constant term, reflecting the downward shift in mean withdrawals. A decrease in the stringency of pandemic-related restrictions is associated with a rise in both the value and volume of ATM withdrawals. The estimated coefficients on the stringency index indicate a one-point increase in the stringency index causing a reduction in (real) monthly ATM withdrawals of two million euro and a fall in the number of monthly ATM withdrawals of 29 thousand.

[12] https://covidtracker.bsg.ox.ac.uk. These data are constructed using the methodology outlined in Hale (2020).

[13] The stringency index variable has a value of zero prior to March 2020.

Table 1 | Impact of Structural Change and Covid-19 Restrictions on ATM Withdrawals

	(i) RATMVal	(ii) ATMVol
Constant	1.495***	12.758***
	(0.008)	(0.071)
DVMAR2020	-0.409***	-4.234***
	(0.029)	(0.255)
Stringency_Index	-0.002***	-0.029***
	(0.001)	(0.004)
R-Squared	0.937	0.961
Sample	2015M01-2022M06	2015M01-2022M06

4. Conclusion

The onset of the Covid-19 pandemic in spring 2020 brought with it a shift in retail payment practices. In particular, there was a partial move from making payments with cash to undertaking them with cards. Reflecting that change, this *Letter* has shown that both the value and volume of ATM withdrawals in Ireland underwent a structural downward shift at the outset of the Covid-19 pandemic with a reduction in the mean of monthly withdrawals occurring. Nevertheless, the analysis indicates that ATM cash withdrawals remained steady subsequently by value and by volume, but at a lower average monthly value than arose before the pandemic, speaking to cash's unique attributes as a means of payment and a store of value and its consequent enduring appeal to the public. The *Letter* also establishes that the stringency of public health measures has explanatory power over ATM withdrawals since April 2020, with less stringency resulting in higher withdrawals. While nominal withdrawal values have been rising, their real value has been relatively steady since autumn 2021, suggesting that users' cash needs are responding to inflationary developments.

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