Bank of England

Substitution between RTGS and instant payment schemes: the impact of the 2022 Faster Payments transaction limit increase on CHAPS

Staff Working Paper No. 1,180
April 2026

James Duffy and James Sanders

Bank of England

Staff Working Paper No. 1,180

Substitution between RTGS and instant payment schemes: the impact of the 2022 Faster Payments transaction limit increase on CHAPS

James Duffy[1] and James Sanders[2]

Abstract

In February 2022, the UK's instant payment scheme, Faster Payments, increased its transaction value limit from £250,000 to £1 million. This provided payments in this value range an alternative means to settle. Using a range of methodologies, we study the subsequent impact on the number of payments settled through CHAPS, the UK's high-value payment scheme that settles payments on a real-time gross basis. We find strong evidence of substitution away from CHAPS to Faster Payments. Specifically, CHAPS volume between £250,000 and £1 million is, on average, between 10.7%–13.7% lower than if Faster Payments had not increased their transaction limit. Furthermore, we find substitution is far greater for customer credit transfers and lower-value payments. These results provide some of the first clear empirical evidence of meaningful substitution from real-time gross settlement schemes to instant payment schemes, raising important implications for payment system operators and the future role of different settlement models.

Key words: Payment systems, payment substitution, instant payments, settlement.

JEL classification: E42, E58, G20.

---

(1) Bank of England. Email: james.duffy@bankofengland.co.uk
(2) Bank of England. Email: james.sanders@bankofengland.co.uk

The views expressed in this paper are those of the authors, and not necessarily those of the Bank of England or its committees. We are grateful to Evangelos Benos, Lorenzo Capello, Ajit Desai, and the participants of the 3rd International Conference on Payments and Securities Settlement 2025 for their advice and feedback.

The Bank's working paper series can be found at www.bankofengland.co.uk/working-paper/staff-working-papers

Bank of England, Threadneedle Street, London, EC2R 8AH
Email: enquiries@bankofengland.co.uk

ISSN 1749-9135 (on-line)

1. Introduction

In the United Kingdom, sterling payment obligations that arise between individuals, financial institutions, businesses, and other parties can be settled using a variety of different payment schemes. All these schemes ultimately settle in central bank money across accounts held at the Bank of England. However, they differ in several important ways. These differences can impact their liquidity efficiency, cost to the end user, speed of settlement, and other important characteristics. Often, the same payment could be settled using multiple different payment schemes. When that is the case, the end-user sending the payment, or their payment service provider (PSP), could make a choice about which payment scheme to use. This empirical study looks at the choice between instant payment schemes and schemes that settle payments on a real-time gross basis in the context of the UK.

CHAPS is the UK's high-value payment scheme operated by the Bank of England. It settles payments on a real-time gross basis, eliminating settlement risk, and has no upper limit on transaction value. Owing to this, it is commonly used to settle critical or time-sensitive high-value wholesale payments. CHAPS also settles time-sensitive lower value payments including housing transactions. We refer to CHAPS as an RTGS scheme, as it provides settlement on a real-time gross basis. The Bank of England's Real-Time Gross Settlement service, also abbreviated as RTGS, is the underlying infrastructure that facilitates real-time settlement across accounts held at the Bank of England (the Bank). Payment schemes such as CHAPS and the Faster Payments Service (FPS) settle on this infrastructure. However, unless stated otherwise, when we refer to RTGS in this paper, we are referring to the settlement model.

The Faster Payments Service, operated by Pay.UK, is a retail instant payment scheme. Instant payment schemes are schemes where the funds appear in the creditor's account instantly, or near instantly, after the payment is instructed. However, while the funds may appear in the creditor's account, it is not always the case that the resulting obligation between the debtor's and creditor's payment service providers has been settled using central bank money at that point. Ultimate settlement in FPS is achieved using a net settlement model. Net obligations between participants are calculated and settled in central bank money three times each business day.

On 8 February 2022, the FPS scheme transaction value limit increased from £250,000 to £1 million, offering an alternative means for CHAPS payments in this range to settle. Payments over £1 million still cannot settle in FPS. This gives us an opportunity to understand how this scheme limit increase affected the number of CHAPS payments made in the affected value range. Significant work has studied substitution from traditional retail payment instruments, such as cash, card, and other account-to-account payment schemes, to instant payment schemes (including Greene et al (2014), and more recently, Khiaonarong and Humphrey (2022)). There are fewer existing studies on substitution from existing real-time gross settlement schemes. This paper provides the first widely available empirical estimation of migration to FPS from existing UK electronic payment schemes. To our knowledge, it is the first empirical study to estimate migration from a scheme that settles on a gross real-time basis to an established instant payment scheme. Our results provide strong evidence that instant payment schemes do successfully compete with incumbent RTGS schemes and cause observable migration.

We employ three empirical approaches to estimate the effect of the FPS value limit increase on CHAPS payment volumes between £250,000 and £1 million. Namely, a baseline regression model incorporating an intervention dummy variable, and two implementations of the synthetic control framework: a multiple linear regression model, and a Bayesian structural time series model, the latter serving as our primary specification.

Across these methodologies we find evidence that following the FPS transaction limit increase, fewer CHAPS payments were made between £250,000 and £1 million than would have been expected otherwise. We show that monthly CHAPS payment volumes in the affected range are, on average, between 10.7-13.7% lower over the studied period. Furthermore, we find CHAPS customer credit transfers were 16% lower, compared to only 7.1% lower for financial institution transfers. Finally, lower-value payments were more likely to migrate than those towards the top end of the £250,000 to £1 million range. Our findings provide valuable insights into customer preferences and long-term trends in the payments ecosystem. These have important implications for policymakers and payment system operators.

This paper is structured as follows. Sections 2 and 3 discuss the motivations for our research, drivers of substitution, existing literature, and this study's contribution. Sections 4 and 5 outline our methodology and the broader context motivating it. In Section 6, we present and compare the results of our baseline and central models. Section 7 provides further decomposition of our results by different payment subsets. Section 8 concludes.

2. Motivations

Instant payment schemes are becoming increasingly common throughout the global payments landscape (see Górka 2025). Instant payment schemes offer an alternative service that competes with incumbent payment instruments. Growth in instant payment schemes may come at the cost of fewer payments being made across the other payment instruments. While retail instant payment schemes are often seen as competing with other traditionally *retail* payment instruments (such as cash, card, and other retail payment schemes), the substitutability of payments between RTGS schemes and instant payment schemes is a key element to understanding how the growth of instant payment schemes affects the wider payments landscape. Central banks and policymakers must keep pace with these evolving dynamics to make well-informed decisions.

The findings of this study will offer payment system operators (PSOs) valuable insights into consumer behaviour, enabling them to innovate and develop products that respond to the evolving needs of the industry. Namely, evidence of migration between CHAPS and FPS could reveal insights into cost sensitivity in the market for payments, given the relatively lower cost of FPS compared to CHAPS. In addition, the level of migration may speak to the extent that participants value real-time movements of central bank money in RTGS, compared to the instant availability of funds offered to end users by instant payment schemes like FPS. These insights will also be valuable to the Bank of England as it collaborates with industry to design policies and products that foster safe innovation, particularly in advancing work on the Future Roadmap for RTGS.

Migration away from CHAPS would have important implications for the Bank of England's medium- and long-term strategy as operator of the RTGS and CHAPS

services. Alongside other PSOs, the Bank of England levies a volume-based charge on CHAPS payments. As such, the substitutability of payment volumes between payment schemes may provide valuable insights for the Bank and other PSOs as they consider future tariff setting policies. In addition, evidence of substitutability presents an opportunity to enhance operational resilience of both FPS and CHAPS, by providing an alternative means of settlement in the event of an outage in one system. This information could assist regulators in their evaluation of the systemic risk that resides within the UK payments infrastructure.

3. Drivers of substitutability and existing work

This section outlines several key drivers of substitution between CHAPS and FPS (Subsections 3a-3d), before outlining existing studies on migration from RTGS schemes to instant payment schemes (Subsection 3e).

3a. Settlement speed

CHAPS and FPS have different settlement models which impact the speed at which funds appear in creditors' accounts and when settlement finality occurs in central bank money.

In FPS, funds are available in the creditor's account nearly instantly after the debtor initiates the payment. In CHAPS, there is often a longer delay between the payment being submitted by the customer and the funds arriving in the creditor's account. A variety of factors can contribute to this delay including the length of the CHAPS payment queue; the time taken to execute matching cycles in the liquidity saving mechanism (see Davey and Gray, 2014); additional screening by payment service providers; and participants actively managing their intraday liquidity. Therefore, customers may prefer the instant availability of funds offered by FPS. Anecdotal evidence from bilateral meetings between the Bank and industry does suggest this is a key driver for migration to FPS.

While funds are available in the creditor's account instantly, in FPS this normally occurs before the resulting obligation has been settled between the debtor's and creditor's payment service providers. In FPS, the net obligations that arise between participant banks are settled in central bank money three times a day.

Therefore, from a customer's perspective, an FPS payment will appear in the creditor's account sooner (and more predictably) after initiation than a CHAPS payment. From a payment service provider's perspective, CHAPS generally settles more quickly, on a real-time gross basis, when compared to FPS.

3b. Cost

Secondly, differences in the costs of making CHAPS and FPS payments may drive substitution. Retail and business customers typically incur a charge to send a CHAPS payment via their payment service provider. This charge varies by provider but is commonly around £25. On the other hand, retail customers are generally not subject to fees when using FPS. Similarly, business customers are typically not charged, or, when fees do apply, they are substantially lower than CHAPS. Therefore, lower costs for end users may provide an incentive for substitution.

Similarly, the per-transaction fee charged to FPS direct participants of around £0.019 (Pay.UK 2025a) is far cheaper than the £0.427 charged per CHAPS payment (Bank of England 2025a). This could present another incentive for CHAPS direct participants to migrate activity to FPS.

3c. Liquidity and prefunding

Since 2015, settlement risk in a number of UK net settlement schemes (including FPS) has been eliminated through a prefunding arrangement. Prefunding eliminates settlement risk by capping each participant's maximum net obligation in the scheme and requiring funds equal to the value of that cap to be held in a prefunding account in RTGS. Should the participant lack sufficient funds for settlement, the funds in their prefunding account can be used for settlement (Bank of England 2025b).

While prefunding eliminates settlement risk, it also increases the liquidity cost of participating in FPS. Prefunding requires that participants hold cash equal to their maximum net debit position in each settlement cycle, as opposed to just the final net position at the end of the cycle. A participant's maximum net debit position will always be at least as large as their final position but can often exceed it. Therefore, for the same set of payments, settlement in FPS can require more funds than settlement in

CHAPS - particularly following the introduction of the CHAPS liquidity saving mechanism (LSM).

Furthermore, funds held in prefunding accounts cannot easily be used for settlement in other payment schemes, representing an opportunity cost of participation in prefunded schemes. Whilst prefunding accounts are remunerated at the Bank of England base rate and count towards a firm's high-quality liquid assets for prudential requirements, a degree of opportunity cost remains, as the participant may be able to achieve greater returns on these funds elsewhere. Frictions in the fungibility of funds used for prefunding may become more relevant as aggregate reserve balances decline.

Given these factors, and the small proportion of CHAPS value in the affected value range, we do not consider liquidity efficiency a contributing factor to migration to FPS.

3d. Transaction value limits

Since its introduction in May 2008, FPS has gradually increased its scheme transaction value limit. Initially, the transaction value limit was set at £10,000. In 2010, the limit rose to £100,000, and in November 2015 it rose again to £250,000. Despite lower-than-expected volumes at introduction (see Hartmann et al. 2019), subsequent growth has seen FPS transaction volumes increase from 109 million single immediate payments in 2009 to 4.27 billion in 2024 (Pay.UK 2025c). On 8 February 2022, FPS raised the transaction value limit again from £250,000 to £1 million. The increase in this limit is greater than what would have been expected had limits been uprated with inflation only: the £10,000 limit from 2008 would have otherwise been £14,363 in 2022 (Bank of England 2025c).

By the end of 2022, FPS had settled over 387,000 payments worth over £250,000 totalling £19.8 billion in value (Pay.UK 2022). Pay.UK, the operator of FPS, stated in their 2022 annual report that "the increase in the transaction limit reflects demand from corporate customers [and] helps to provide greater choice in the market for those organisations wishing to make higher-value payments" (Pay.UK 2022, page 22). The extent to which these payments would have otherwise settled in CHAPS is the subject of this study.

Straightforwardly, higher limits mean more payments made in CHAPS could also settle in FPS. Importantly however, the actual maximum value made available to end-users by their payment service provider is often considerably lower than the scheme's transaction value limit. For example, while the FPS scheme transaction value limit is £1 million, at the time of writing Barclays limits individual and some business clients' FPS payments to £50,000. The full £1 million value is available only to "Business (high value online)" and "Corporate/FI" customers (Pay.UK 2025b). The client limits vary considerably by payment service provider but are often below FPS' scheme transaction value limit. This could have three effects on CHAPS to FPS substitution. Firstly, it limits the sample of payments that can settle in either scheme. Secondly, if client limits rise proportionally to the scheme limit, limit increases may have impacts on value bands lower than the value band that has been opened in FPS. Thirdly, client limits may take time to adjust when scheme transaction limits increase. This means that the impact on CHAPS volumes may build over time. We should be able to observe that effect when studying our results.

3e. Existing work

There is limited previous work on payment substitution between CHAPS and Faster Payments. Before the introduction of FPS, Milne and Tang (2005) discussed the potential impact of faster payments on incumbent payment schemes in the UK. The authors highlighted the large number of low-value CHAPS payments but argued that despite an instant payments scheme being able to compete for those low-value payments, substitution would likely be limited. This is due to financial institutions continuing to use CHAPS as their default scheme for all transactions regardless of value and the high proportion of cross-border payments settling using CHAPS. Cross-border payments may require additional information and screening for financial crime. The instant availability of funds in the debtor's account in instant payment schemes could make the monitoring of the payment queue more challenging. Cross-border activity in CHAPS accounts for a minimum of 52% of payment volumes (Duffy and Sanders 2024), therefore this factor could impact migration from CHAPS to FPS.

Later, Greene et al (2014) studied the impact of FPS on existing UK payments instruments including CHAPS. The authors showed that increases in FPS volumes did not correspond to declines in the volume of CHAPS, Bacs, and debit card transactions.

However, the authors were unable to draw any further conclusions on the impact of the introduction of FPS on incumbent electronic payments schemes. Since these two domestic studies were produced, several changes to the FPS scheme, including the introduction of prefunding and increases to the transaction value limit, may have altered the incentives to migrate to FPS.

Internationally, there are limited studies into substitution from RTGS to competing instant payment schemes. Kosse et al (2020a) predicted migration in the context of plans to replace and upgrade existing Canadian payment systems. The authors predicted a substantial portion of payment value would migrate from LVTS, the incumbent high-value payment system, to RTR, a new real-time payment rail. This finding aligned with a matching empirical study which estimated RTR will inherit almost 20% of payment value from LVTS (Kosse et al 2020b). The authors did acknowledge that scheme transaction value limits, like those found in FPS, would reduce the proportion of payments that migrate to RTR. Furthermore, they acknowledged migration may be limited by the other factors including the settlement of cross-border payments in RTGS schemes. Comparisons between Canada and the UK may be limited due to LVTS not being analogous to CHAPS. In LVTS, payments were processed with finality in real-time but only netted and settled at the end of the day. This differs from CHAPS, and other true RTGS schemes, where payments are settled on an immediate real-time basis.

Furthermore, the growth of instant payment schemes tends to come at the expense of other competing retail payment instruments (Hartmann et al. 2019). A working paper published by the International Monetary Fund (IMF) suggested that high-value wire transfers settled in RTGS are “functionally separable” from payments made via instant payment schemes (Khiaonarong and Humphrey 2022, page 4). This assumption stems from a CPMI survey, which found “limited scope” for migration from RTGS to instant payment schemes amongst most member jurisdictions (CPMI 2021, page 17). Explanations from jurisdictions ranged, including that they had found no observable trends; that it was too early to study substitution; or that RTGS and instant payment schemes were not considered substitutes. The authors noted, however, that this could change if instant payment transaction limits were raised. The recent increase in the FPS transaction value limit provides an opportunity to test this hypothesis.

Overall, there is limited existing evidence of migration from RTGS to instant payment schemes both domestically and internationally. This is driven in part by a general lack of available studies on the topic and a focus on substitution from alternative retail payment instruments such as card, cash, and cheques to instant payment schemes. Studies on RTGS to instant payment scheme substitution are mixed. However, we hypothesise that CHAPS to FPS migration may be taking place for several primary reasons.

a. Bilateral conversations with industry suggest that end-users value the speed and predictability at which funds appear in their accounts when using FPS. Several industry participants have noted demand from clients for migration to FPS from CHAPS.
b. The higher per-unit cost of CHAPS payments for participants, and particularly end-users, is likely a catalyst for migration.
c. Faster Payments is a mature payment system founded in 2008. This gives us a longer time series for analysis and allows for participants to engage in technical migration and required familiarisation.
d. Since 2015, Faster Payments has been fully prefunded. This means that, like CHAPS, settlement risk is eliminated.
e. The FPS limit has increased to £1 million as of February 2022. This captures most CHAPS payments. Further details on the distribution of CHAPS volume are given in Section 4.

These factors reduce potential frictions that could prevent substitution between CHAPS and FPS.

4. Characteristics and drivers of CHAPS volume

Before discussing our results, it is useful to study the descriptive characteristics of CHAPS payments. This will help provide context for our estimates, the size of the CHAPS market, and our selection of controls. For example, while the average CHAPS payment value in 2022 was £1.94 million, the median CHAPS payment value was only £5,300. CHAPS payments under £1 million represented 93.7% of total CHAPS volume and 3.2% of CHAPS value. So, despite being the UK's high-value payments system, most payments settled by CHAPS are below the FPS limit.

Given the low proportion of CHAPS value and the high proportion of volume below £1 million, migration in this value range is more impactful on overall CHAPS payment volume compared to value. Therefore, we focus our study on the migration of CHAPS volume. In addition to payment value and volume, central bankers and prudential regulators are often interested in the liquidity required to settle CHAPS payments. In our sample period, payments between £250,000 and £1 million represent just 2.1% of CHAPS values. This, combined with the effect sizes in our proceeding analysis and offsetting in the LSM, means any impact on the liquidity required to settle CHAPS payments is negligible.

Figure 1: Monthly CHAPS volume between £250,000 and £1 million

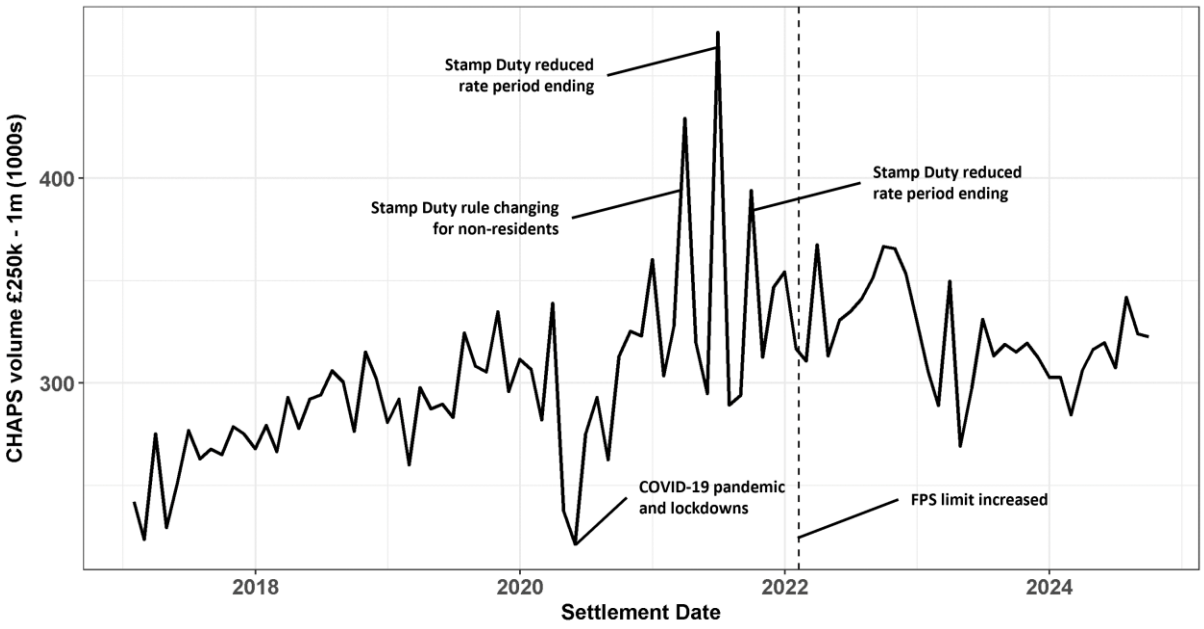


Figure 1 gives the total monthly CHAPS volume between £250,000 and £1 million from January 2017 until September 2024. Between 2020 and 2022, there were several events which significantly impacted CHAPS volume in this value range. Firstly, the COVID-19 pandemic and associated lockdowns in 2020 caused a large fall in CHAPS volume. In 2021, there were three changes to Stamp Duty Land Tax which caused large spikes in CHAPS volume. Stamp Duty Land Tax, or simply Stamp Duty, is a tax paid by the purchasers of property or land in England and Northern Ireland. There are similar taxes for Scotland (Land and Buildings Transaction Tax) and Wales (Land Transaction Tax). The amount paid depends on several factors including the value of

the property, whether the purchaser is a first-time buyer or owns other property, whether the purchase is residential, and if the buyer is a UK resident.

Stamp Duty changed three times in 2021. From 1st April 2021 onwards, non-residents were required to pay a two percentage points higher Stamp Duty rate than UK residents. On 1st July 2021, a temporary increase in the nil rate band for Stamp Duty was removed, effectively increasing the tax paid on purchases from this date onwards. Finally, on 1st October 2021 there were further reductions in the Stamp Duty nil rate threshold, once again increasing the amount payable for many property purchases. In the days prior to these three Stamp Duty changes, there were unusually high CHAPS volumes. CHAPS continues to be the primary payment system used for housing completion payments between the buyer's conveyancer and the seller's conveyancer.

The high volumes were driven by property purchases being brought forward to avoid paying higher Stamp Duty – an activity known as forestalling. Forestalling of property purchases in the UK is not uncommon and has been observed during many previous property tax increases (Matthews 2016). This demonstrates the importance of the housing market in our subsequent modelling.

In the period from 2017 until early 2022, there appears to be roughly linear growth in CHAPS volume between £250,000 and £1 million, as illustrated by Figure 1. From early 2022 until the end of our sample period, that volume growth appears to have paused. However, there was little-to-no observable fall in CHAPS volume in that latter period. This motivates our methodology. We cannot simply attribute any fall in CHAPS volume from February 2022 to the FPS limit change. Instead, we will generate a counterfactual series which predicts what CHAPS volumes would have been, had the limit change not occurred.

5. Methodology

Our analysis studies the impact of the FPS transaction value limit increase on the number of CHAPS payments made between £250,000 and £1 million. We begin by estimating substitution across all CHAPS payments between £250,000 and £1 million, in aggregate. We have not considered if this change had any further migration effect on payments under £250,000.

5a. Model Selection

We cannot estimate migration from CHAPS to FPS by observing FPS payment volumes alone. FPS volumes may be influenced by migration from other payment schemes or organic growth. Additionally, the Bank of England does not operate FPS and lacks data on individual transactions, observing only netted obligations in RTGS.

Instead, we use a range of methods to estimate the impact of the increased FPS transaction value limit on CHAPS volumes using only CHAPS data. Our central estimate is generated through the application of a synthetic control framework implemented using a Bayesian structural time series model. We also present baseline models to further increase confidence in our results. These baseline models are a linear regression with an intervention dummy variable (henceforth simple intervention model), and a synthetic control methodology implemented using multiple linear regression.

All our models take advantage of the FPS value limit change only impacting the £250,000 to £1 million range, and not higher value bands. The higher value bands will be used to construct a control group for our treated series.

The key difference between our simple intervention model and synthetic control models is the period used to train the model. In our simple intervention model, all observations from January 2017 until September 2024 are used to fit the model. Whereas synthetic control models are trained only on the pre-intervention period (January 2017 to January 2022). Further details are provided below.

5b. Model specification

Most of our model specifications draw from the same set of independent variables (controls in synthetic control methodologies). These controls balance explanatory power, model complexity, and satisfy our models' assumptions. The key assumptions for the synthetic control methodologies are set out below:

1. The controls must effectively predict CHAPS volume between £250,000 and £1 million ("treated series") before the FPS transaction limit increase ("intervention").

2. The control series are unaffected by the FPS transaction limit increase.

3. The relationship between the controls and CHAPS volume between £250,000 and £1 million established in the pre-intervention period is maintained after the intervention.

To ensure our chosen control set balances predictive power, model complexity, and business knowledge, we employ a variable selection process for each of our models. In the context of our linear models with a fixed number of controls, our chosen set of control series was partly informed by the Bayesian Information Criterion (BIC) and Akaike Information Criterion (AIC). We compute BIC and AIC for all potential control combinations and selected a model that balances minimising these criteria whilst aligning with business knowledge. Our central Bayesian structural time series model performs its own further variable selection upon these controls, a process we discuss in more detail later. The controls chosen, and a table of summary statistics for each (Table 1), are detailed below.

Chosen controls:

a. The volume of CHAPS payments between £1 million and £2.5 million (Bank of England proprietary data)

This series exhibits the strongest correlation with the treated series, with a pairwise correlation of 0.76. Payments in this range have similar characteristics to those in the affected range, whereas higher value bands exhibit weaker correlations with the treated series. Payments industry experts suggest that it is too costly and operationally challenging to “split” payments in this range to remain under the new £1 million limit. This is primarily driven by reconciliation and screening costs. Therefore, we are confident that this series is unaffected by the intervention. The series is relatively stable with a coefficient of variation of 12.8%, which reflects a modest spread of monthly volumes from the mean.

b. The number of UK residential property transactions (sourced from HM Revenue & Customs 2025)

Residential property transactions are a key driver of payments in the £250,000 to £1 million value range due to longstanding use of CHAPS by the housing market. This series exhibits a strong positive pairwise correlation of 0.72 with the treated series. A coefficient of variation of 23% highlights substantial relative volatility compared to our other control series. Given the large transaction volumes, elevated volatility of the series, and its clear link to CHAPS activity, we anticipate that this control will be a significant driver of CHAPS volumes in the affected range.

c. The number of UK non-residential property transactions (sourced from HM Revenue & Customs 2025)

Non-residential property transactions are another key driver of payments in the £250,000 to £1 million range, with a pairwise correlation of 0.45. Monthly volumes of non-residential property are much lower than residential property transactions. The relative volatility of 13.4% is also modest compared to residential property transactions. Owing to these properties, we would anticipate that this series would be a weaker driver of CHAPS volumes in the affected range than the residential property transaction series. Furthermore, we would expect a larger proportion of non-residential property transactions to fall in value bands above £1 million, when compared to residential transactions. Nonetheless, given CHAPS' importance to the non-residential property market, we keep this variable in our models.

d. UK House Price Index (sourced from HM Land Registry 2025)

Fluctuations in house prices impact the volume of housing transactions that fall within the £250,000 to £1 million value range. This series exhibits the lowest relative volatility of the four controls, indicating that whilst house price trend upwards over time, they do so in a relatively predictable manner. Given the high proportion of transactions in this range attributable to housing, the impact of house price movements on CHAPS volumes is relevant. Rising house prices will push some higher-value housing transactions out of the £250,000 to £1 million value range. Simultaneously, rising house prices also push transactions that would have settled in lower value bands into the £250,000 to £1 million value range. In February 2022, the month when the FPS

scheme transaction value limit increased, the average UK house price was £276,755 (HM Land Registry 2022). Therefore, as house prices rise, the number of transactions moving into the £250,000 to £1 million range should exceed the number moving out. This dynamic results in a positive pairwise correlation of 0.54 between house prices and volume in the affected value range.

Table 1: Control Variable Summary Statistics

Variable	Min	Max	Mean	Standard Deviation	Coefficient of Variation
Monthly CHAPS volume £250,000 - £1m (dependent)	221,304	471,342	306,470	39,227	12.8%
Monthly CHAPS volume £1m-2.5m	66,832	107,762	86,151	9,748	11.3%
UK residential property transactions	37,350	214,540	98,626	22,710	23.0%
UK non-residential property transactions	5,310	13,460	10,006	1,338	13.4%
UK house price index	112.89	153.50	131.90	13.18	10.0%

Note: Coefficient of variation = standard deviation / mean.

We include observations from January 2017 until September 2024. The training period is chosen to maximise the number of observations. In late 2015 the FPS transaction limit increased to £250,000 and prefunding was introduced. We start our training period in 2017 to avoid any spillover or delayed impact of these changes on our training data. We sample both the control and dependent variable series at a monthly frequency, reflecting the most granular data available for the controls.

We considered other price controls including inflation series (RPI and CPI). However, a structural break in inflation close to the date of the FPS limit increase could mean the pre- and post-intervention relationship between inflation and the treated series differs, violating a core assumption of synthetic control methodology. Furthermore, the underlying drivers linking inflation to CHAPS volumes are less clear.

6. Results

Our primary methodology is a synthetic control framework implemented using a Bayesian structural time series model, which is discussed in Section 6c. In Sections 6a and 6b we provide two more simple alternative models which help increase our confidence in the robustness of our findings.

6a. Baseline simple intervention model

First, we run a baseline linear regression model, which includes an additional dummy variable that is set to 1 following the FPS scheme value limit increase and 0 otherwise. The coefficient on this variable can be interpreted as the estimated average effect of the FPS value limit increase on CHAPS volumes between £250,000 and £1 million. This model is fit using all our data from January 2017 until September 2024. The model's output is provided in Table 2.

Table 2: Baseline simple intervention regression model output

Independent Variables (Monthly Frequency)	Dependent variable: **Monthly CHAPS volume £250k - £1mn (1000s)**
CHAPS volume £1-2.5mn (1000s)	2.707***
	(0.179)
UK house price index	1.299***
	(0.209)
UK residential property transactions	0.001***
	(0.0001)
UK non-residential property transactions	-0.003***
	(0.001)
Limit Change (0/1)	-38.496***
	(5.392)
Constant	-149.210***
	(24.656)
Observations	93
R^2	0.948
Adjusted R^2	0.945
Residual standard error	9.179 (df = 87)
F statistic	318.680*** (df = 5; 87)

Note:
*p<0.1; **p<0.05; ***p<0.01
Standard errors are reported in parentheses.
"Limit Change" is a dummy variable equal to 1 in the post-intervention period for the treated series.
Sample includes 93 monthly observations for the treated and the control series, covering both pre- and post-intervention periods.

Table 2 shows that the estimated average effect on CHAPS volume between £250,000 and £1 million was -38,496 per month. In total, that amounts to 1.23 million fewer payments made in CHAPS because of the FPS scheme value limit increase in the period from February 2022 to September 2024.

Most coefficients on the other control variables align with our expectations:

a) **CHAPS volume £1-2.5mn (1000s).** A monthly increase in CHAPS volumes of 1000 in this value range is associated with a monthly increase of 2707 payments in the affected value range. Payments in the £1m to £2.5m value range are most similar in nature to those in the affected range. It is reasonable that as volumes of similar payments in the wider CHAPS system increase so do those in the £250,000 to £1m range.

b) UK house price index. An increase in UK house prices of 1% relative to the base year is associated with a monthly increase of 1299 CHAPS payments in the affected value range. This result is consistent with the idea that increasing house prices pushes some transactions that would have settled in lower value bands into the £250,000 to £1 million value range. As discussed, given median property values are near the bottom of our value range, the number of additional transactions moving into our range should exceed the number moving out.

c) **Residential property transactions.** An increase of one residential property transaction per month is associated with one additional CHAPS payment per month in the affected value range. This aligns with our knowledge that CHAPS is commonly used to settle residential housing transactions in the UK.

d) **UK non-residential property transactions.** A negative coefficient is unexpected. This could be driven by the moderate degree of collinearity between non-residential and residential property transactions (pairwise correlation of 0.6). We repeated our analysis without this variable and the average effects remained very similar across our specifications.

6b. Multiple linear regression (MLR) synthetic control

Synthetic control methodologies estimate the causal impact of an intervention by comparing the observed post-intervention series to a synthetically constructed counterfactual series. The synthetic counterfactual is derived as the weighted average

of controls that minimises the distance between the treated and synthetic counterfactual in the pre-treatment period. In other words, it is the weighted combination of control variables that best predicts CHAPS volumes before the FPS limit increase. Synthetic control methodologies offer the distinct benefit of constructing the counterfactual from pre-treatment data only, eliminating the risk that the actual treatment effect could influence the construction of the counterfactual.

To set a baseline estimate, we first implement this approach using a multiple linear regression. Using the same control time series as in our baseline simple intervention model, we fit a multiple linear regression in the period from January 2017 until January 2022. Table 3 provides the model's output. We then use the fitted model to predict what CHAPS volumes would have been in the period following the intervention. The resulting fitted values are subtracted from observed CHAPS volume to get the residual. This residual acts as our estimated pointwise effect.

Table 3: Output for trained model in multiple linear regression synthetic control model

Independent Variables (Monthly Frequency)	Dependent variable: **Monthly CHAPS volume £250k - £1mn (1000s)**
CHAPS volume £1-2.5mn (1000s)	2.972*** (0.177)
UK house price index	1.471*** (0.188)
UK residential property transactions	0.001*** (0.0001)
UK non-residential property transactions	-0.004*** (0.001)
Constant	-184.036*** (22.509)
Observations	61
R^2	0.969
Adjusted R^2	0.966
Residual standard error	7.920 (df = 56)
F statistic	431.070*** (df = 4; 56)
Note: *p<0.1; **p<0.05; ***p<0.01 *Standard errors are reported in parentheses.* *Sample includes 61 monthly observations for the treated and the control series, covering only the pre-intervention period.*	

Figure 2: Estimated effect of FPS limit increase on CHAPS volumes based on residual of fitted multiple linear regression and observed values.

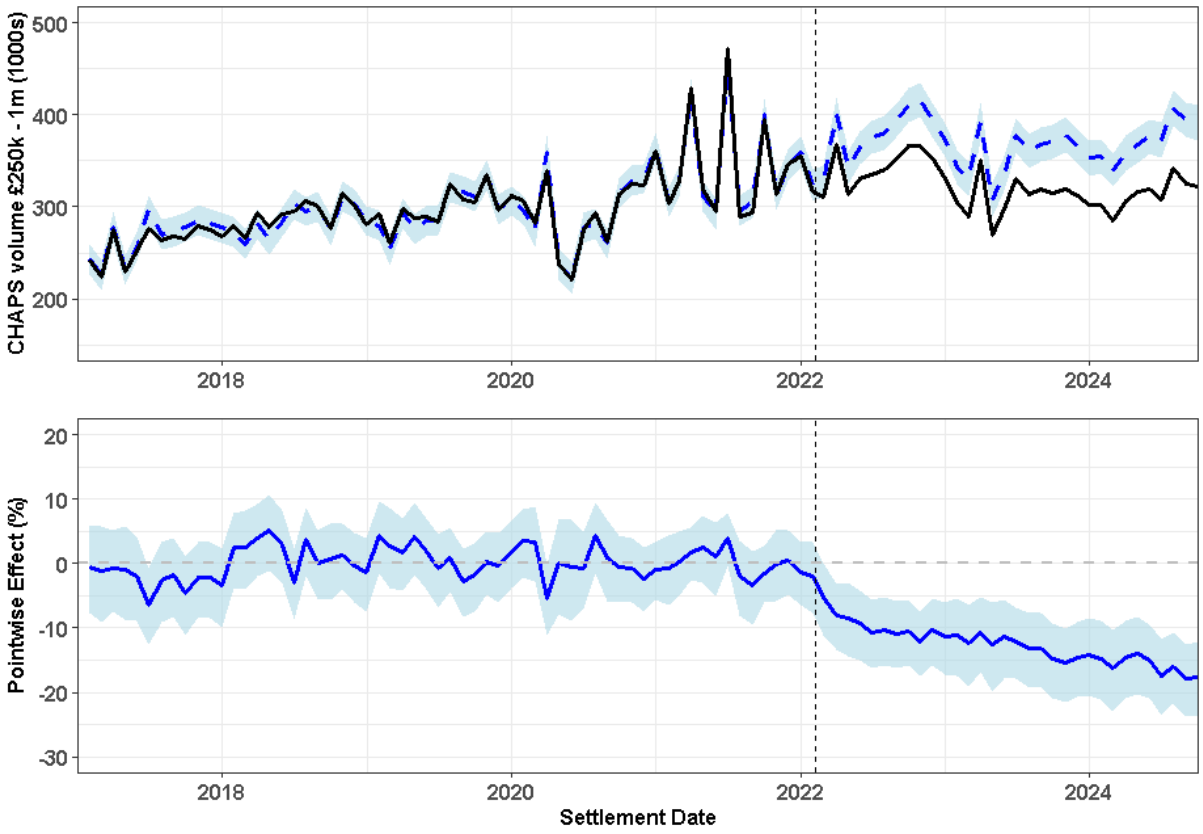


Figure 2 gives the pointwise estimate for the effect of the FPS scheme value limit increase on CHAPS volume between £250,000 and £1 million. The black line in the top chart is the observed CHAPS volume between £250,000 and £1 million. In this specification, the dotted blue line represents our model's prediction over the period after the intervention, and the shaded blue area is the 95% prediction intervals. This acts as our counterfactual series. The bottom chart is the difference between the observed and counterfactual volume as a percentage of counterfactual volume. This is an estimate for the pointwise percentage effect on CHAPS volume.

Once again, we observe a consistent increase in the percentage effect on CHAPS volumes. The total of the residuals in the treatment period is -1.5 million, a slightly larger estimated effect than in the baseline simple intervention framework. The coefficients on the control variables are similar to those of the simple intervention model. Overall, the results align closely with the baseline simple intervention model, increasing confidence in our results.

6c. Bayesian structural time series

Our central approach uses a Bayesian Structural Time Series (BSTS) model implemented using Google's CausalImpact R package (Brodersen and Hauser 2017) to construct the synthetic counterfactual. Once again, the model is trained using the same control time series in the period from January 2017 to January 2022.

The Bayesian framework offers a fully probabilistic approach to statistical inference. It combines prior knowledge about model parameters with observed data to produce posterior probability distributions, which reflect updated beliefs about those parameters. Priors play a critical role in this process, reflecting the researcher's knowledge or beliefs about the likely values of parameters before seeing the data. These priors can be informative, reflecting substantial domain knowledge, or less informative, allowing the data to exert greater influence on the posterior distributions generated.

The Bayesian implementation offers several benefits over the baseline MLR residuals approach. Whilst the MLR approach produces point estimates with standard errors that capture uncertainty for each coefficient individually, the Bayesian framework yields full posterior probability distributions for each parameter. This both captures the joint uncertainty across all parameters and provides a natural way to express uncertainty in probabilistic terms.

This probabilistic quantification of uncertainty allows for more interpretable statements about the treatment effect. For example, a 95% Bayesian credible interval means that, conditional on our model and data, there is a 95% probability that the true causal effect lies within the stated range. Similarly, we can directly state the posterior probability of a causal effect, representing the probability the true treatment effect is non-zero.

Finally, the Bayesian framework offers benefits in the variable selection process. In the context of synthetic controls methodology, this is the process of selecting the combination of control series that best fits the treated series in the pre-treatment period. Unlike our baseline models, which partly rely on a separate AIC/BIC-driven selection step, the Bayesian implementation integrates variable selection directly into the model. This is achieved through spike-and-slab priors, which facilitate selection and provide

a transparent probabilistic interpretation of the likelihood that each control series contributes meaningfully to the synthetic control.

One key parameter the researcher must set is the prior standard deviation of the Gaussian random walk of the local level, to which the magnitude of our estimated effect is sensitive. For datasets with less residual volatility, Brodersen and Hauser (2017) recommend a value of 0.01 data standard deviations. The R^2 and adjusted R^2 in Tables 2 and 3 show there is very little residual volatility in our high-volume series once our controls are regressed out. Therefore, we progress with the recommended value for the prior standard deviation.

Another important parameter the researcher may specify is the prior inclusion probability (PiP) for each control, reflecting the a priori belief about its predictive power in the pre-treatment period. This is implemented within the Bayesian Structural Time Series model underlying the CausalImpact framework and is a crucial element of the model's variable selection process. Prior inclusion probabilities work alongside the spike-and-slab priors placed on the control coefficients, where the "spike" is a narrow distribution centred at zero, effectively constraining the coefficient to zero, and the "slab" is a broader distribution permitting non-zero values. Intuitively, a PiP of 1 asserts a strong a priori belief that the coefficient belongs in the slab (is non-zero), whereas an agnostic PiP of 0.5 represents complete uncertainty. We set the default prior inclusion probability for each control at 0.6, reflecting prior knowledge of their business relevance while preserving the model's flexibility to learn from the training data.

These priors partly inform variable selection, implemented by approximating the posterior distribution through a Markov Chain Monte Carlo (MCMC) sampling algorithm. From this, we obtain the posterior inclusion probabilities for each control coefficient, reflecting the likelihood that the coefficient was sampled from the slab during the MCMC process. We also obtain the posterior means of the coefficients, averaged across zero (spike) and non-zero (slab) draws. In practice, these summaries are only informative once the Markov chain has reached a stable stationary distribution, ensuring that the empirical sampling distribution closely approximates the true posterior rather than being distorted by early iterations. Consequently, the BSTS package sets a "burn-in" of the first 10% of MCMC samples, which are discarded for

purposes of inference. The posterior inclusion probabilities and mean coefficients for each control are shown in Figure 3 and Table 4, respectively.

Figure 3: Posterior Inclusion Probabilities for Control Variables

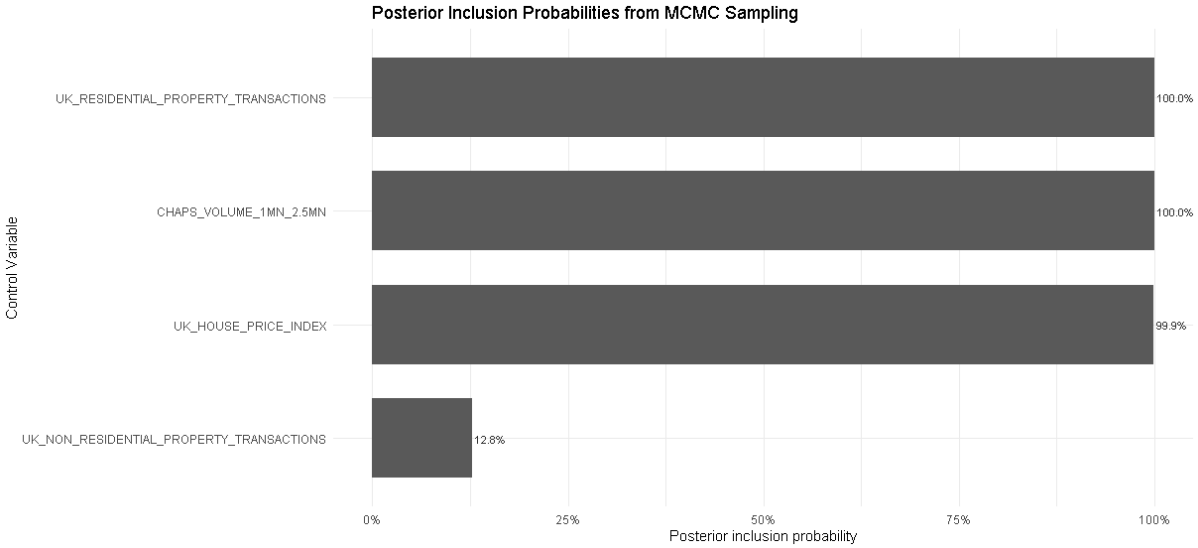


Figure 3 shows that the posterior inclusion probabilities for three of our four selected controls are near 1, indicating that their coefficients were drawn from the slab in almost all post–burn-in MCMC iterations. This suggests strong evidence that their inclusion improves model fit. However, the posterior inclusion probability of the Non-Residential Property Transactions control is only 0.12, meaning its coefficient was drawn from the slab in just 12% of post–burn-in draws. This is reflected in its small mean coefficient estimate and indicates that including it does not substantially improve pre-treatment fit. This provides an example of how the spike and slab priors perform variable selection within the BSTS model. For consistency with our other models and given the spike-and-slab coefficient is very small, we leave this control in the model and proceed to estimate the counterfactual using the CausalImpact package.

Figure 4: The BSTS estimated impact of the increase in FPS maximum transaction value on CHAPS volumes between £250,000 and £1 million

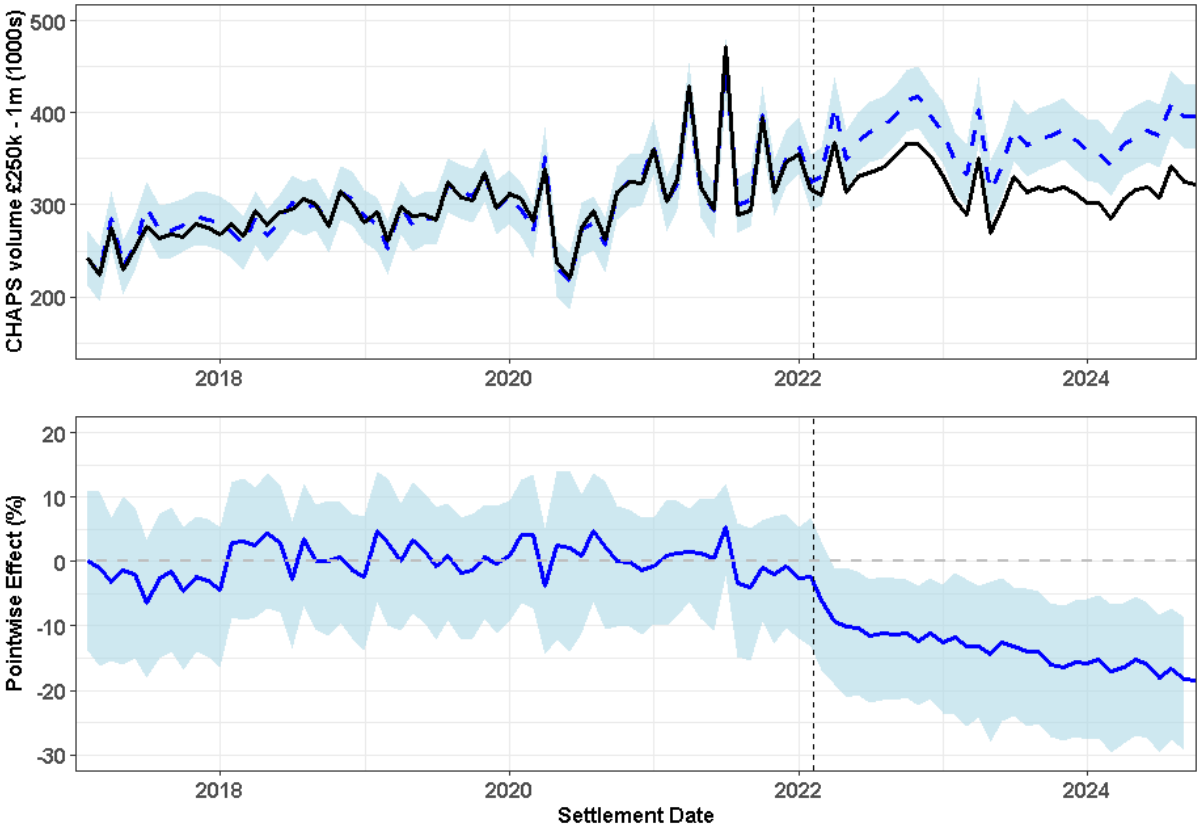


Figure 4 shows the synthetic counterfactual and the observed post-intervention CHAPS volumes for our BSTS approach. As before, the solid black line in the top chart represents the observed CHAPS volume in the £250,000 to £1 million range. The blue dotted line represents the synthetic counterfactual generated by the model, and the shaded area is the 95% credible interval. The model again predicts that CHAPS volumes in the £250,000 to £1 million range would have been higher in the absence of the increased FPS transaction value limit. The bottom chart shows the estimated percentage monthly reduction in CHAPS volumes attributable to the FPS limit increase. Much like our previous models, the chart illustrates a gradual increase in the effect.

Table 4: Output from BSTS synthetic control model

Observed total volume (1000s)	10,316
Counterfactual total volume (1000s) (s.d)	11,957 (291.3)
Absolute effect (1000s) (s.d) Absolute effect (1000s) 95% CI	-1,641 (291.3) [-2,205, -1,061]
Relative effect (s.d) Relative effect 95% CI	-13.7% (2.1%) [-18%, -9.3%]
Posterior probability of causal effect	99.999%
Note: *The 95% credible interval (Bayesian) is reported, not a frequentist confidence interval.* *Standard deviations are in parentheses.*	

As shown in Table 4, the model estimates that 1.64 million payments settled via FPS instead of CHAPS due to the intervention, equating to a 13.7% reduction in CHAPS volumes in the affected value range on average over our treatment period. This is the largest estimated effect across all our models. These results suggest the posterior probability of a causal effect is >99.99%**.**

6d. Comparison of results

Despite some uncertainty in the effect size, each of our models predict that CHAPS volume between £250,000 and £1 million would have been greater if FPS had not increased its scheme transaction value limit in February 2022. Table 5 summarises the effect sizes estimated by the three models. Using data from Pay.UK, the operator of FPS, we express the estimated effect sizes as a percentage of actual FPS transaction volumes between February 2022 and September 2024, providing a benchmark against which to assess their plausibility.

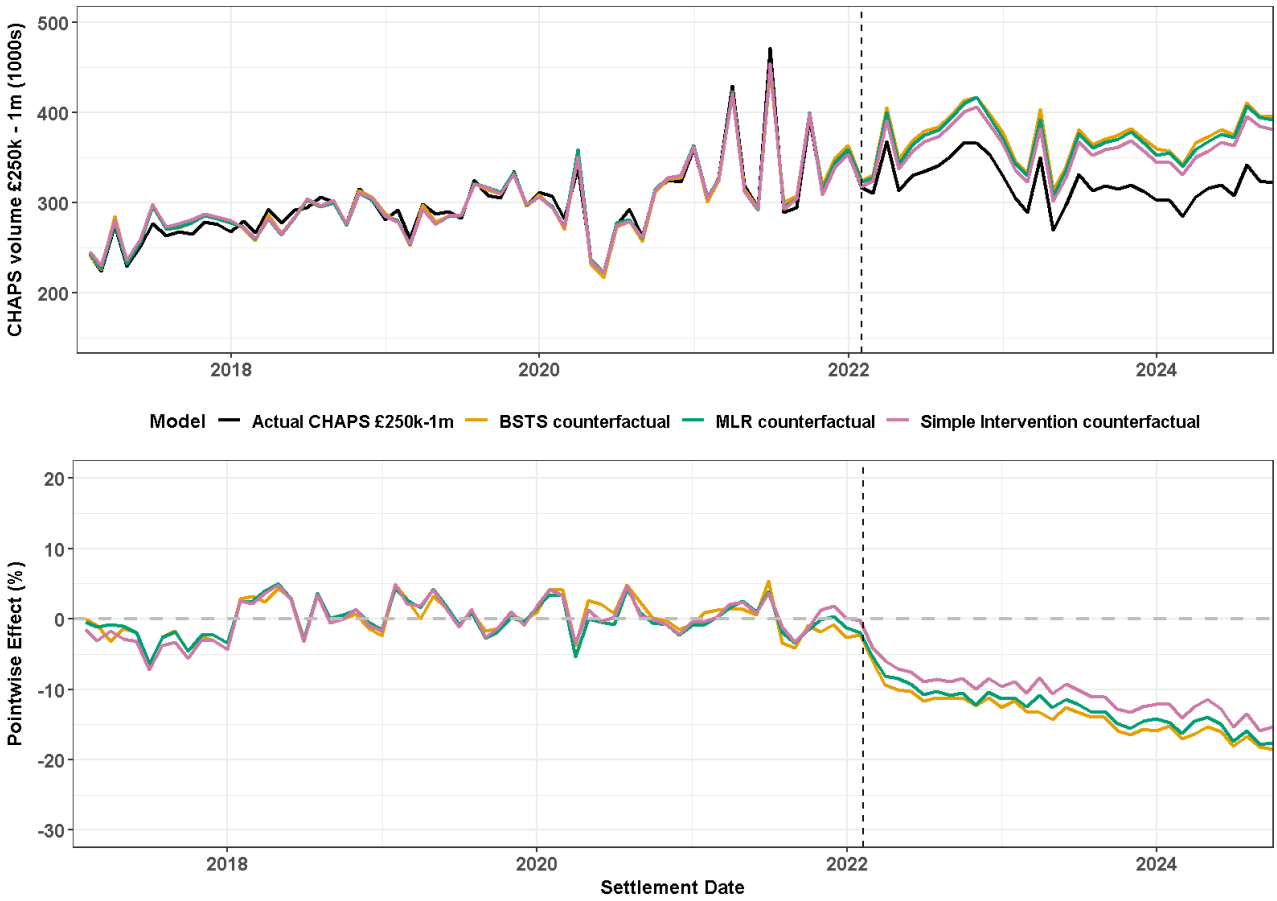
Table 5: Summary of results for estimated effect of CHAPS volume between £250,000 and £1 million

Model	Estimated total effect (millions)	Total effect as % of counterfactual CHAPS volume*	Total effect as % of FPS actual volume
Simple intervention regression	-1.2	-10.7%	72%
Multiple linear regression residuals	-1.5	-12.7%	87.9%
Bayesian structural time series	-1.6	-13.7%	95.8%

*Total effect as % of counterfactual CHAPS volume is defined as: the total of the estimated pointwise effects as a percentage of the observed CHAPS volume minus the total of the estimated pointwise effects.

Central estimates suggest that CHAPS volumes declined by between 10.7% and 13.7%. These reductions correspond to approximately 72%–96% of actual FPS payments in the £250,000 to £1 million range. While we do acknowledge these effect sizes are large as a proportion of actual FPS volumes, the minimal variation between the central estimates, coupled with the fact that none exceed the actual FPS settlement volume, provides reassurance on the consistency and credibility of the results. The robustness of these findings is further illustrated in Figure 5, which compares actual CHAPS volumes with the three counterfactual series generated by each model, alongside each model's estimated pointwise effect. The close alignment of the model outputs highlights the consistency of the results.

Figure 5: Comparison of the pointwise effects on CHAPS volumes across the three models



7. Differences in substitution rates by payment subsets

Next, we study the relative rate of substitution from CHAPS to FPS for different groups of payments within the £250,000 to £1 million range.

7a. Differences in substitution rates by transfer type

Firstly, we examine the difference in substitution effects between customer credit transfers and financial institution (FI) transfers. A customer credit transfer is a transfer between financial institutions on behalf of their customers, who can be individuals, businesses, or other non-financial institutions. CHAPS customer credit transfers are used for a range of purposes including property purchases, tax payments, supplier payments, and merchant acquirer payments. On 19th June 2023, CHAPS payments migrated to the ISO 20022 messaging standard (Bank of England 2025d). Under this standard, customer credit transfers are submitted by participants as pacs.008 payment messages. Prior to June 2023, CHAPS used the SWIFT MT format where the

equivalent was the MT103 message. Financial institution transfers are payments where both the debtor and creditor are financial institutions. Under the ISO 20022 messaging standard, CHAPS financial institution transfers are submitted as pacs.009 messages, with the predecessor being the MT202. In 2024, while customer credit transfers (pacs.008 transfers) constituted most of CHAPS payments by volume (76%), they represented only 27% by value.

FPS payments may be a closer substitute for customer credit transfers (pacs.008 transfers) in CHAPS than financial institution transfers (pacs.009 transfers). Given the lower average value of customer credit transfers, there may be a greater incentive for those clients to shift their payment between £250,000 and £1 million from CHAPS to FPS. That value range would represent a larger proportion of their business, and more greatly justify the upfront cost of any infrastructure investment. Furthermore, non-FI customers may value the instant availability of funds within their account offered by FPS more than the instant settlement in central bank money offered by CHAPS. Therefore, you may expect to see a larger effect on customer credit transfers than financial institution transfers.

To test this hypothesis, we repeat our methodology separately for customer credit transfers and financial institution transfers. In this section, for the sake of brevity, we will only be sharing the results from our BSTS synthetic control methodology. While we have demonstrated that our three methods do give similar estimates, the key insights from this section should be the relative rates of migration between each payment subset rather than the absolute level of substitution.

Table 6: Output from BSTS synthetic control model for customer credit transfers

	Customer credit transfers	Financial institution transfers
Observed total volume (1000s)	7,281	3,035
Counterfactual total volume (1000s) (s.d)	8,730 (302.6)	3,271 (84.5)
Absolute effect (1000s) (s.d) Absolute effect (1000s) 95% CI	-1,449 (302.6) [-1,998, -777]	-235 (84.5) [-401, -70.3]
Relative effect (s.d) Relative effect 95% CI	-16% (2.9%) [-22%, -9.6%]	-7.1% (2.4%) [-12%, -2.3%]
Posterior probability of causal effect	99.998%	99.703%

Table 6 shows the BSTS synthetic control model results for our two models. For customer credit transfers, the selected controls were the same as for the aggregate model. Financial institution transfers are not used to settle residential and non-residential property transactions. As such, the controls selected were the volume of CHAPS payments between £1 million and £2.5 million; and the retail price index (RPI). We did not use RPI in our other models due to a structural break in the series occurring close to the intervention date. This could cause the pre- and post-intervention relationship between the control and treated series to differ, which may bias the estimates of the counterfactual. As such, this limitation should be considered when interpreting results.

Our results confirm that the increase in the FPS scheme transaction value limit caused a much larger fall in customer credit transfers than in financial institution transfers. There were 16% fewer customer credit transfers in CHAPS between £250,000 and £1 million compared with 7.1% fewer financial institution transfers. The total effect for these two models is similar to the total effect from our aggregate model (1.67 million compared to 1.64 million), once again demonstrating the robustness of our findings.

7b. Differences in substitution rates by settlement value

Next, we estimate the effect across different value subsets within the £250,000 to £1 million range. There are several reasons why higher-value payments may migrate more slowly. As discussed previously, the transaction value limit passed on to clients is often lower than the FPS scheme value limit. Furthermore, the risks and costs of fraud increase with the value of the payment, so payment service providers may prefer CHAPS where the payment queue is more closely monitored. Finally, higher-value payments are more likely to be initiated by large complex corporates or FIs. These parties may migrate more slowly for the reasons set out in our transfer type analysis.

We run a BSTS synthetic control model for three payment subsets: (1) CHAPS payments between £250,000.01 and £500,000; (2) CHAPS payments between £500,000.01 and £750,000; and (3) CHAPS payments between £750,000.01 and £1 million. All models are constructed with the same controls as our aggregate and customer credit transfer models. A summary of our results is given in Table 7.

Table 7: BSTS synthetic control model outputs for value band subsets

	£250,000.01 - £500,000	**£500,000.01 - £750,000**	**£750,000.01 - £1 million**
Observed total volume (1000s)	6,422	2,228	1,666
Counterfactual total volume (1000s) (s.d)	7,554 (196.3)	2,528 (62.3)	1,850 (59.2)
Absolute effect (1000s) (s.d)	-1,132 (196.3)	-299.6 (62.3)	-184.2 (59.2)
Absolute effect (1000s) 95% CI	[-1513, -747]	[-419, -174.3]	[-294.3, -79.3]
Relative effect (s.d)	-15% (2.2%)	-12% (2.2%)	-9.9% (2.9%)
Relative effect 95% CI	[-19%, -10%]	[-16%, -7.3%]	[-15%, -4.5%]
Posterior probability of causal effect	99.999%	99.992%	99.998%

Table 7 compares the BSTS synthetic control model outputs for our three payment value subsets. As the payment value increases, the effect size becomes smaller. For CHAPS payments between £250,000.01 and £500,000 there are 15% fewer payments that would have been expected had FPS not increased its scheme transaction value limit. This falls to 12% and 9.9% for CHAPS payments between £500,000.01 and £750,000 and between £750,000.01 and £1 million, respectively. The total of all three absolute effects over the full post-intervention period is 1.62 million, very close to the total in our aggregate BSTS model (1.64 million). Once again, the consistency of our results between payment subsets and aggregate models reassures us of the robustness of our findings.

8. Conclusions

Our findings suggest that CHAPS payment volumes between £250,000 and £1 million were, on average, 10.7-13.7% lower than expected in the period between the Faster Payments Service increasing their scheme transaction value limit from £250,000 to £1 million in February 2022 until September 2024. This equates to 0.9%-1.2% of all CHAPS payments over the period. Our synthetic control approaches both find evidence that this effect increased over the period as a percentage of CHAPS payments. We also find the effect on CHAPS customer credit transfers was over twice that on CHAPS financial institution transfers. Finally, the effect was larger for payments that were lower in value. Our findings are consistent with internal qualitative estimates and discussions with industry. This suggests a degree of substitutability between RTGS and instant payment schemes.

The observed migration is significant for payment system operators as it reveals insights into the choices participants and end users make for payments. One interpretation is that the results indicate an increased demand for instant payment services due to the more rapid availability of funds for end users. Alternatively, the results might reflect the sensitivity of participants and users of payment systems to the costs of participation and marginal costs of making payments. Extensions to our analysis could support estimations of the price elasticity of demand for payment services. It is likely that a combination of these factors is driving the migration from CHAPS to FPS.

We must also consider the evolution of the UK payments landscape. FPS is yet to adopt the ISO 20022 messaging standard used by CHAPS, but once complete, this alignment will reduce data compatibility frictions and will likely enhance payment substitutability.

It is important to stress that the generalisability of results is unclear due to the unique characteristics of payments at different values and of the UK payments landscape. Further developments in the competitive landscape may impact the incentives and opportunities for payment substitution. Given the limited existing literature, similar studies in other jurisdictions would be beneficial.

References

Bank of England (2025a). *RTGS and CHAPS fees.* Online. Available at: https://www.bankofengland.co.uk/payment-and-settlement/rtgs-chaps-fees (accessed January 2026).

Bank of England (2025b). *Bank of England Settlement Accounts*. Online. Available at: Access policy for RTGS settlement accounts and services | Bank of England (accessed January 2026).

Bank of England (2025c). *Inflation calculator.* Online. Available at: https://www.bankofengland.co.uk/monetary-policy/inflation/inflation-calculator (accessed January 2026).

Bank of England (2025d). *ISO 20022 Handbook*. Online. Available at: https://www.bankofengland.co.uk/payment-and-settlement/rtgs-renewal-programme/iso-20022-handbook (accessed January 2026).

Brodersen, K. H., & Hauser, M. A. (2017). *Package 'CausalImpact.'* Google LLC: Mountain View, CA, USA. Version 1.2.1.

Committee on Payments and Market Infrastructures (CPMI) (2021). *Developments in Retail Fast Payments and Implications for RTGS Systems.* Bank for International Settlements. Available at: https://www.bis.org/cpmi/publ/d201.pdf (accessed January 2026)

Davey, N. & Gray, D. (2014). *How has the Liquidity Savings Mechanism reduced banks' intraday liquidity costs in CHAPS?* Bank of England Quarterly Bulletin, 2014 Q2, page 180. Available at: https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2014/how-has-the-liquidity-saving-mechanism-reduced-banks-intraday-liquidity-costs-in-chaps.pdf (accessed January 2026).

Duffy, J., & Sanders, J. (2024). *Payments without borders: using ISO 20022 to identify cross-border payments in CHAPS.* Bank Underground. Online. Available at: https://bankunderground.co.uk/2024/09/26/payments-without-borders-using-iso-20022-to-identify-cross-border-payments-in-chaps/ (accessed January 2026).

Górka J (2025). *The rise of instant payments: a cross-country comparison*. Central European Management Journal, Vol. 33 No. 4 pp. 575. Online. Available at: https://doi.org/10.1108/CEMJ-10-2024-0297 (accessed March 2026).

Greene, C., Rysman, M., Schuh, S. D., & Shy, O. (2014). *Costs and benefits of building faster payment systems: the UK experience and implications for the United States*. Federal Reserve Bank of Boston Research Paper Series Current Policy Perspectives, (14-5).

Hartmann, M., Hernandez-van Gijsel, L., Plooij, M., & Vandeweyer, Q. (2019). *Are instant payments becoming the new normal? A comparative study* (No. 229). ECB Occasional Paper.

HM Land Registry (2022). *Press Release: UK House Price Index for February 2022.* Online. Available at: https://www.gov.uk/government/news/uk-house-price-index-for-february-2022 (accessed January 2026).

HM Land Registry (2025). *UK House Price Index.* Online. Available at: https://landregistry.data.gov.uk/app/ukhpi/?lang=en (accessed January 2026).

HM Revenue & Customs (2025). *Accredited official statistics: Monthly property transactions completed in the UK with value of £40,000 or above.* Online. Available at: https://www.gov.uk/government/statistics/monthly-property-transactions-completed-in-the-uk-with-value-40000-or-above (accessed January 2026).

Khiaonarong, M. T., & Humphrey, D. (2022). *Instant payments: regulatory innovation and payment substitution across countries*. International Monetary Fund Working Paper (2022-228).

Kosse, A., Lu, Z., & Xerri, G. (2020a). *An economic perspective on payments migration*. Bank of Canada Staff Working Paper, (2020-24).

Kosse, A., Lu, Z., & Xerri, G. (2020b). *Predicting Payment Migration in Canada*. Bank of Canada Staff Working Paper, (2020-37).

Matthews, P. (2016). *Forestalling ahead of property tax changes.* Office for Budget Responsibility Working Paper, 10.

Milne, A., & Tang, L. (2005). *An economic analysis of the potential benefits and dis-benefits of faster payments clearing*. Office of Fair Trading, (795).

Pay.UK (2022). *Annual Report and Financial Statements 2022.* Online. Available at: wearepay.uk/wp-content/uploads/2023/07/Pay.UK-2022-Annual-Report-Financial-Statements-website-version.pdf (accessed January 2026).

Pay.UK (2025a). *FASTER PAYMENTS SYSTEM PRINCIPLES*. Online. Available at: https://www.wearepay.uk/wp-content/uploads/2025/05/Pay.UK-Faster-Payments-System-Principles-v-10.1-May-2025.pdf (accessed January 2026).

Pay.UK (2025b). *Transaction limits*. Online. Available at: https://www.wearepay.uk/what-we-do/payment-systems/faster-payment-system/transaction-limits/ (accessed January 2026).

Pay.UK (2025c). *FPS MONTHLY VOLUMES AND VALUES 2008 – 2024*. Online. Available at: wearepay.uk/wp-content/uploads/2025/01/Monthly-Payment-Statistics-from-1990-to-December-2024.xlsx (accessed February 2025).