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The Kindness of Strangers: Brexit and Bilateral Financial Linkages*

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Abstract

Bank of England governor Mark Carney warned after the 2016 Brexit vote that the UK is reliant on the “kindness of strangers” to fund its increasing current account deficit. In this paper, we examine whether firms in Switzerland attenuated their investments in the UK following the Brexit vote or whether British-controlled firms in Switzerland repatriated their foreign assets to the UK. Three empirical findings in the bilateral context suggest that Carney’s warning was overly cautious. First, Carney focused strictly on the foreign willingness to invest in the UK; however, the alternative channel of repatriating British assets abroad is equally important. Second, capital inflows and outflows are positively correlated not only in the aggregate, but also across a range of subgroupings at the firm level. Third, the nonuniform firm response to the Brexit vote suggests that understanding aggregate capital waves is more complicated at the firm level.

Keywords: Brexit, currency invoicing, cross-border flows, international firms

JEL Classification Number: F32, F41, G20, G28

1 Introduction

The 2016 Brexit vote is associated with a large, unanticipated shock to the UK economy.¹ In response to the leave outcome, Bank of England governor Mark Carney (2017) warned that the UK has become more reliant on the “kindness of strangers” to fund its increasing current account deficit.² Carney’s (2017) warning is that the post-Brexit-vote environment unleashed new and persistent uncertainties resulting in higher risk premiums demanded by foreign investors.³ A current account deficit requires net capital inflows, i.e., foreigners’ willingness to purchase domestic assets. An alternative channel not highlighted by Carney’s warning is through capital gains on sales of past foreign investments by domestic agents. Disentangling the two channels to test Carney’s warning is difficult because, as shown by Broner et al. (2013) and Davis and van Wincoop (2018), cross-border flows in gross assets and in gross liabilities are positively correlated. One solution to this identification problem of separating the two investment channels is to examine the heterogeneous response of a firm’s cross-border inflows and outflows to the Brexit shock separately.

This paper investigates the “kindness of strangers” hypothesis with re-

¹For example, Corsetti et al. (2022), Fernandes and Winters (2021), and Chen et al. (2022) treat the Brexit vote as an exchange rate shock.

²The quarterly current account deficit was 6.9% at the time of the Brexit vote in 2016:Q3. This figure represented the largest recorded quarterly deficit since the British Office of National Statistics started compiling balance of payments data in 1948.

³Ratings agency Moody’s cut the United Kingdom’s debt rating on October 16, 2020, citing the coronavirus crisis, Brexit, and the lack of clear budget plans from Prime Minister Boris Johnson’s government; see Reuters October 16, 2020, <https://www.reuters.com/article/britain-ratings-moody-s-idUSKBN272025>. Additionally, the IMF’s external sector report (2021) repeatedly emphasized that the UK external sector between 2013 and 2020 was judged to be weaker than implied by fundamentals.

spect to the Brexit shock for a bilateral setting of cross-border flows using firm-level data. The objective is to determine whether foreign firms reduced their purchases of British assets after the 2016 Brexit vote or whether British-controlled firms abroad repatriated their foreign assets. The first action is consistent with Carney's (2017) warning of increasing economic uncertainties surrounding the future course of Brexit and the reluctance of foreigners to invest in the UK. The second action of increased repatriation of foreign assets suggests that the UK is able to absorb shocks to the current account through capital gains from foreign asset sales.

The analysis uses a difference-in-differences (DiD) framework to study the behavior of different currency-denominated cross-border flows of firms resident in Switzerland to and from 57 countries, including the UK, at the time of the 2016 Brexit shock. Firm-level data on quarterly cross-border flows are from the Swiss National Bank's cross-border capital linkages survey. The survey data, examined for the first time in this study, are attractive over other data sources capturing firm-level information. First, the firm-level survey offers a consistent categorization of cross-border flows into equity and debt investments with respect to balance of payments definitions and accounting standards. Second, the survey offers a breakdown of cross-border flows into currency denomination and source or destination countries with a high share of foreign-controlled firms residing in Switzerland. Third, firm-level identifiers, such as employment, industry and nationality, are part of the survey.

The investment behavior of firms resident in Switzerland to the Brexit shock is of interest for three main reasons. First, Switzerland has a large,

positive current account-to-GDP ratio, averaging over 8.5 percent between 2010 and 2019. Bernanke (2005) argued in the US case that a low domestic saving rate should not be viewed in isolation. An unusually high level of worldwide savings relative to investment opportunities in the US has resulted in downward pressure on world interest rates. Potentially, the same forces are at play in a bilateral setting between the UK and Switzerland. Second, both the UK and Switzerland are financial centers. Lane and Milesi-Ferretti (2007) show empirically that financial centers have an elevated level of cross-border flows and are an important driver in capturing the dynamics of international capital flows. Switzerland’s banking sector is heavily exposed to the post-Brexit fragmentation of the financial sector. An unspecified share of London’s financial services is expected to be transferred to the European continent (Stojanovic and Wright, 2021; Demski et al., 2022). Third, recent empirical findings by Chen and Novy (2022) suggest that trade cost elasticities are heterogeneous to trade agreements. In particular, countries with small export shares to larger countries are most exposed to large variations in trade cost elasticities.⁴

The evidence that the Brexit shock permanently dampened Swiss foreign investments in the UK is limited at best. Carney’s (2017) “kindness-of-strangers” narrative appears too pessimistic at least in the context with respect to our bilateral setting. This assessment is based on three empirical findings. First, before and after the Brexit vote, capital inflows and outflows are positively correlated across a range of subcomponents at the firm level.

⁴Although Switzerland is not part of the European Union, it was heavily exposed to the Brexit vote. After the Brexit vote, the Swiss Federal Council negotiated nine agreements in October 2016 that came into force on 1 January 2021. Switzerland is also a Schengen member; thus, Brexit restricted the immigration flow between the two countries.

The parallel behavior of capital flows resulting in the accumulation of foreign assets and liabilities documented in Broner et al. (2013) and Davis and van Wincoop (2018) also holds at the firm level in the face of a large shock. The second finding pertains to the limited observed pullback of capital outflows by Swiss firms to the UK. One particular exception is the finding that capital outflows by banks and finance companies in Switzerland to the UK fell more than capital inflows to Switzerland from the UK. This result holds only for British pound denominated capital inflows for banks and finance companies. Capital inflows denominated in other currencies were unaffected by the Brexit shock. A third finding is that firms residing in Switzerland did not always respond uniformly, as is often indirectly assumed in the capital waves literature; see Forbes and Warnock (2012, 2021).

In this paper, we make three contributions to the large literature on cross-border capital flows. The first contribution is presenting new evidence in the realm of international financial adjustment. The events surrounding the current account adjustment in the post-Brexit-vote period are similar to those in the discussion of US current account sustainability during the run up to the Global Financial Crisis (GFC). Cavallo and Tille (2006) and Gourinchas and Rey (2007) argue that valuation gains smooth the adjustment process. Similarly, Curcuru and Thomas (2015) and Curcuru et al. (2008) consider international returns to be an important channel for US investment. Our bilateral analysis sheds light on the view that even in the face of large shocks and current account adjustment, firms residing in Switzerland did not respond in a uniform manner to the Brexit shock.

The second contribution rests with studies that identify the drivers of

global capital flows. Forbes and Warnock (2012), Schularick and Taylor (2012), Miranda-Agrippino and Rey (2015), Cerutti et al. (2017), and Ha et al. (2017) attribute US monetary policy and global risk aversion as the two main drivers of international capital flows. Avdjiev et al. (2020) recently reconfirm the evidence for these two drivers, but argue that US monetary policy became more important relative to global risk aversion after the GFC. This development arose because of greater monetary convergence among advanced economies and better capitalized banks with lower exposure to global risks. Although the Brexit shock does not fit as a driver of US monetary policy, this shock represents an increase in the country risk premium and has potential global implications. Our empirical evidence, however, suggests that country-specific shocks outside the US do not always unleash sudden cross-border outflows among advanced economies.

The third contribution extends the growing literature on Brexit and trade to financial linkages. This paper is the first to explore firm-level responses to the Brexit vote in terms of cross-border capital flows. As in this paper, a branch of studies uses the Brexit vote as an unanticipated shock to re-examine classic open-economy relationships. Corsetti et al. (2022), Fernandes and Winters (2021), and Chen et al. (2022) define the sharp depreciation in the British pound at the time of the Brexit vote as a natural experiment to test theories of currency invoicing and exchange rate pass-through. Other studies attempt to explain the Brexit shock through different channels. Calantone and Stanig (2018) show empirically that import competition from low-wage countries explains the Brexit vote. Portes and Forte (2017) and Wadsworth et al. (2016) set the focus instead on immigration, whereas Fetzner (2019)

argues that domestic fiscal policy in earlier years was responsible for the leave outcome. Becker et al. (2017), Dustmann et al. (2017), and Dijkstra et al. (2020) note that socioeconomic factors were also important in the Brexit outcome. Regardless of how the channels of the Brexit shock are defined, we show with firm-level data that the timing of the Brexit shock did not have a homogeneous effect on capital flows to the UK in a bilateral setting.

The paper is organized as follows. Section 2 motivates the “kindness of strangers” hypothesis and Brexit effect on financial linkages in a bilateral setting. Section 3 discusses the data and its sources. Section 4 outlines the empirical setup. Section 5 presents the empirical results. Section 6 concludes.

2 Background: Brexit and the kindness of strangers

Carney (2017), after the Brexit vote, stated “the UK relies on the kindness of strangers at a time when risks to trade, investment, and financial fragmentation have increased.” The warning focuses primarily on the behavior of foreign investors and offers little guidance on the investment dynamics of domestic firms or British-controlled firms residing abroad. A broad interpretation of Carney’s warning suggests that the three main components – goods trade balance, investment income, and services trade via a smaller financial service industry – will permanently affect the current account.⁵ Even prior

⁵Carney (2017) does not define what is implied by financial fragmentation. One interpretation is that part of the financial service industry is shifting its activities from London to other European financial capitals, Stojanovic and Wright (2021).

to the Brexit vote, Carney (2016) warned about a potential leave outcome and the UK's current account vulnerability. "Britain's economy has grown strongly over the past two years but the forthcoming vote on its membership of the European Union has emphasised some of its vulnerabilities. Near the top of this list is Britain's current account deficit, which at 3.7% of GDP is large by international standards," Carney (2016).

Carney's (2017) warning of the UK's external vulnerability in the face of the Brexit vote is distinct from recent models that emphasize reduced capital flows arising from US monetary policy spillover effects, extended financial leverage, and real exchange rates, i.e., Borio and Zhu (2012), Bruno and Shin (2015), and Gourinchas and Obstfeld (2012). First, the nature of the shock differs. Carney (2017) highlights a domestic supply-side shock defined by a new international regulatory environment, whereas Bruno and Shin (2015) and Gourinchas and Obstfeld (2012) highlight the role of a foreign monetary shock. For example, the risk-taking channel by Bruno and Shin (2015) assumes that a contractionary monetary shock restrains financial leverage by banks, which reduces cross-border flows. Similarly, Gourinchas and Obstfeld (2012) argue that a common driver of financial crises is financial leverage and real exchange rate appreciation. Both developments are not integral to Carney's (2017) narrative. Second, Carney's (2017) warning of increased UK external vulnerability best resembles the debate over slow versus rapid US current adjustment prior to the GFC; see Cavallo and Tille (2006) and Gourinchas and Rey (2007). The latter studies argue that capital flows are an equilibrium outcome of global investors' portfolios that balance risk and return through diversification. The issue is whether the determinants of cap-

ital flows arising from a diversified portfolio change quickly and massively in the face of a single country shock such as the Brexit vote.

Implicit in Carney’s warning is that investors are heterogeneous. In the simplest portfolio choice model, the Lucas (1978) tree model with homogeneous investors, a shock to the demand for assets from one tree generates a shift in prices and does not lead to capital flows. Instead in a portfolio choice model, for example by Davies and van Winccop (2022), the heterogeneity of investors both within and across countries leads to level shifts in gross capital flows after a shock.

It is beyond the scope of the paper to explain the UK’s current account and exchange rate movements; however, their developments before and after the Brexit vote are important for interpreting the “kindness of strangers” hypothesis. Figure 1 plots the quarterly UK current account deficit relative to GDP and shows that after the Brexit vote, the UK current account deficit reversed its deteriorating trend that had started with the GFC. The UK current account deficit-to-GDP ratio increased from -2% in 2009:Q3 to over -6% in 2016:Q3. Thereafter from 2017:Q1 to 2019:Q4, the deficit narrowed to nearly -3%. This current account reversal after the Brexit vote, which is consistent with Freund and Warnock (2007) reversal definition, partially mitigates the “kindness of strangers” hypothesis. However, it must be remembered that Carney warned on numerous occasions that a current account-to-GDP ratio of -3% was regarded as still too high.

[Figure 1 UK CA here]

The current account reversal coincides with a large depreciation in the

British pound (GBP). Figure 2 plots the GBP against four major currencies: US dollar (USD), euro (EUR), Japanese yen (JPY), and Swiss franc (CHF). The selected monthly sample from April 2015 to December 2019 corresponds to the period of analysis of Swiss cross-border flows in section 5. The currencies exhibit a sharp appreciation vis-à-vis the GBP; however, they did not behave uniformly. The CHF appreciated 14% against the British pound between February 2016 and October 2016. This Brexit response was more moderate compared to the appreciation of the other three cross rates (i.e., average appreciation 17%).

[Figure 2 GBP FX here]

Several factors explain the slightly weaker response of the CHF to the Brexit vote compared to that of other major currencies. First, financial linkages between the UK and the US (i.e., ranked first for inward foreign direct investment position to the UK in 2019), Japan (second), and the euro area (third) are stronger than those between the UK and Switzerland (fifth after Jersey). Second, the CHF experienced its own exchange rate shock after the Swiss National Bank (SNB) decided to discontinue the minimum exchange rate of CHF 1.20 per euro in January 2015, because the international environment for its monetary policy had changed dramatically. The CHF appreciated by more than 13% against the GBP on January 15, 2015.⁶ Thereafter, Swiss monetary policy was extremely expansionary. The SNB Annual Report 2020 states that SNB foreign exchange interventions were about CHF 67.1 billion, increasing SNB sight deposits by 16.7% in 2016. Despite the slightly

⁶See Auer et al. (2021) and Bonadio et al. (2020) for further discussions on the large and sudden CHF appreciation in 2015.

smaller appreciation of the CHF versus major currencies, the exchange rate shock at the time of the Brexit vote was still substantial for firms residing in Switzerland to re-evaluate their asset holdings.

3 Data description

Firm-level capital flows data⁷ are based on the cross-border capital linkages surveys conducted by the SNB.⁸ Companies domiciled in Switzerland and Liechtenstein are obliged to submit data on their cross-border positions and/or transactions to the SNB on a quarterly and/or annual basis.⁹

In our analysis, we focus on the sample of firms that submitted their data on a quarterly basis to the SNB from 2015:Q1 until 2019:Q4.¹⁰

The quarterly survey provides data on positions as either stocks at the end of the quarter or flows during that quarter – but not both – depending on investment type. Quarterly flows data are used directly in our analysis (after log transformation using the inverse hyperbolic sine transformation). In the case of stocks data, quarterly flows are estimated after removing the valuation changes based on the currency and asset class of the stock.¹¹ In the

⁷Our data are in fact at the enterprise group level, i.e., all cross-border positions of all entities resident in Switzerland within the enterprise group are consolidated. In this paper, we use the terms firm, company and group interchangeably when we refer to enterprise groups.

⁸The surveys were introduced in their present form in 2014:Q4 and have not been modified since then.

⁹This is a partial survey but covers all economically relevant companies for our purposes in this paper. Legal entities and companies are surveyed by the SNB for transaction values exceeding CHF 1 million per reporting item or for foreign assets or liabilities exceeding CHF 10 million per reporting item at the time of the survey.

¹⁰These firms have relatively larger cross-border positions and/or transactions compared to those firms that submit data to the SNB only on an annual basis.

¹¹A supplementary document explaining the details on how we estimate valuation

next stage, the estimated flows are transformed using the inverse hyperbolic sine transformation.

The cross-border capital linkages surveys provide data on stocks and flows in various investment types: direct investment - equity and debt -, portfolio investment - stocks and bonds -, and other investment. However, our data for portfolio investment is rather small compared to those for the remaining categories, because firms do not report their foreign assets held in a bank custody account and do not know the identity or residency of the holders of the stocks or bonds traded in financial markets.¹²

The data on stocks and flows have currency and country breakdown. The currency denomination can be one of the following: USD, EUR, GBP, CHF, JPY, and all the other currencies. The country list contains 190 countries.

The cross-border capital linkages surveys do not provide information on a firm's cash position. Total turnover of derivatives with cross-border counterparties is available in our data however there are no country or currency breakdowns of the underlying positions. Additionally, derivative assets and liabilities data are available for various currencies but without the country breakdown.¹³

The analysis in section 5 focuses on a narrower dataset that captures capital flows between Switzerland and 57 countries that registered at least one cross-border activity during our sample.¹⁴ This reduced sample is mo-

changes and, hence, capital flows from stocks data is available on request.

¹²Portfolio investment statistics of Switzerland are compiled using bank surveys but without security-by-security breakdown such that portfolio assets or liabilities of the firms in our sample cannot be individually compiled.

¹³The buildup of cash and derivatives positions ahead of the Brexit vote would have provided valuable information on how firms perceived this vote.

¹⁴See Appendix A for the list of 57 countries. The very low ratio of the number of

tivated by limiting the potential zero-observation bias discussed in Baldwin and Harrigan (2011).

Firm-level information on the number of employees (i.e., our measure of firm size) and the residency of the ultimate controlling institution (Swiss, British, or other) are used in the regression analysis as controls. This information also comes from the annual cross-border capital linkages survey.

Table 1 provides summary statistics on our sample of companies and their capital flows with 57 countries. Five observations can be made. First, there are considerably more non-banks and non-finance (Non-B & Non-F) companies (362) than there are banks and finance (B & F) companies (79). Second, our sample of companies has financial linkages with not only the UK but also other countries denominated in GBP. The number of observed nonzero flows to and from the UK is approximately half the number of nonzero flows denominated in GBP. Third, the average size of capital in- and outflows is heavily influenced by the Brexit break in the sample. For both the B & F companies and Non-B & Non-F companies, total capital in- and outflows fell sharply following the Brexit vote. Fourth, there is a clear difference between the B & F companies and Non-B & Non-F companies in the behavior of the of UK asset and UK liability flows. B & F companies on average, as for the total flows, record higher average flows before the Brexit vote than afterwards. The opposite is, however, observed for the Non-B & Non-F companies. Fifth, the variance in capital in- and outflows is considerably higher for the post-Brexit-vote period. The latter two observations concerning the

nonzero observations to total observations (i.e., approximately 1%) indicates that even with our sample of 57 countries the number of zero observations is large. Our regression results are robust to using a dataset that includes only 25 countries.

B & F companies are consistent with the “kindness of strangers” hypothesis of a potential drop in investment flows to the UK and an increase in their variance after the Brexit vote.

[Table 1 Summary statistics on companies here]

Next, Table 2 provides summary statistics of our sample of companies’ exposure to the UK. The share of companies with assets in the UK before the Brexit vote is 60.3 percent, and this share increases to almost 62 percent at the end of our sample period. Additionally, the share of UK assets in their portfolio increases from 4.1 percent in 2016:Q2 to almost 6 percent in 2019:Q4. The same pattern can be observed for liabilities¹⁵.

[Table 2 Summary statistics on UK exposure here]

Tables 3 and 4 provide a further breakdown of our sample by resident nationality and firm size. Note that our sample of companies is dynamic regarding their nationality. Due to mergers and acquisitions or redomiciliations of parent companies, the nationalities of the firms in our sample changes over time. Table 3 shows that a higher fraction of B & F companies are foreign-controlled compared to non-B & non-F companies, i.e., approximately 20 percent of B & F companies and about 36 percent of non-B & non-F companies are Swiss controlled. Furthermore, 10 percent of B & F companies and 3 percent of non-B & non-F companies are British-controlled.

[Table 3 Summary statistics on firm nationality here]

¹⁵Appendix B provides figures summarizing aggregate capital flows data

In contrast, our sample is stable in terms of industry. The firms do not switch between B & F and non-B & non-F. Furthermore, firms in our sample are more likely to be large than small. Table 4 shows that more than a quarter of B & F companies and almost half of non-B & non-F companies in our sample have more than 250 employees. Note also that employment information is not available for a nonnegligible fraction of our sample. We keep these firms in our sample and report their results separately in Section 5.

[Table 4 Summary statistics on firm size here]

Capital flows statistics, such as our data, follow balance of payments accounting standards and are residency-based. It is commonly recognized that residency-based statistics do not adequately represent exposures. Bertaut et al. (2020) argue that three main factors lead to potential distortions between country of residence and economic exposure. First, multinational firms are often incorporated into jurisdictions with low tax rates. We cannot exclude this possibility; however, firms residing in Switzerland were still required to assess their asset allocation in the face of the Brexit shock. A second driver of distortions is that firms seek to improve their access to capital markets and the pool of global bond investors. Bertaut et al. (2020) argue many firms, particularly those in emerging market economies (EMEs), issue corporate bonds using a subsidiary firm or financing arm located in a market outside their home country. Again, this potential distortion is limited for Swiss and foreign-controlled firms residing in Switzerland as the corporate bond market is small. Thus, this potential distortion should not impede our analysis. A

third source of distortions in official statistics comes from the growing importance of mutual funds¹⁶ and other managed investment funds as vehicles for cross-border investment. International statistical standards for the balance of payments classify holdings of investment fund shares as equity, even if they consist entirely of non-equity securities such as bonds, and assign them to the domicile country of fund incorporation. Our analysis considers a wide range of investment categories that almost completely exclude mutual funds (i.e., portfolio investment) as they are not reported in the capital linkages survey by firms when they are held in bank custody accounts.

4 Empirical strategy

The DiD estimation approach regresses Swiss cross-border flows at the firm level on a fixed-effects setting that controls for firm, country, and time trends. The baseline specification includes an interaction term between a Brexit dummy and a UK country dummy, which controls for Swiss cross-border flows to and from the UK:

$$\ln(X_{i,c,t}) = \beta(Post_t * UK_c) + \delta_t * \alpha_i + \zeta_c + \epsilon_{i,c,t}, \quad (1)$$

where $X_{i,c,t}$ are total, equity, debt or other currency denominated investments for capital in- and outflows, i denotes firms, c denotes 57 countries, and t is the time period from 2015:Q2 to 2019:Q4. Investment flows are either net acquisition of foreign assets (i.e., capital outflows) or net incurrence of liabilities (i.e., capital inflows). Because $X_{i,t}$ can be positive or negative and

¹⁶Also known as investment funds or collective investment schemes

because of the high level of dispersion of capital in- and outflows particularly after the Brexit vote, the inverse hyperbolic sine transformation is used to generate $\ln(X_{i,c,t})$. The dummy variable, $Post_t$, as in Carney’s warning assumes a permanent effect on capital flows, resulting from the new economic environment in leaving the EU.¹⁷ The dummy variable is unity starting in 2016:Q3 and thereafter and zero otherwise. The dummy variable, UK_c , captures country specific cross-border flows and is unity for bilateral flows to and from the UK and Switzerland. The interaction term, $Post_t * UK_c$, captures cross-border flows to and from the UK after the Brexit vote. The interacted firm-time effects, $\delta_t * \alpha_i$, controls for heterogeneous firm flows over time.¹⁸ The country effects are captured by ζ_c . The error term is denoted by $\epsilon_{i,c,t}$. In equation (1), we also consider separate regressions that control for capital flows denominated in different currencies, firm size, and firm nationality.

The coefficient of interest in equation (1) is β . Table 6 provides an overview of its interpretation. A negative coefficient, $\beta < 0$, for $\ln(X_{i,c,t})$ defined by Swiss capital outflows to the UK suggests that Swiss firms attenuated their investments to the UK after the Brexit vote. This would be consistent with the “kindness of strangers” hypothesis that post-Brexit Britain is vulnerable to operating with a higher risk premium and that foreign investment experiences a pullback effect. Next, $\beta \geq 0$ for the same capital outflow suggests that capital outflows from Switzerland to the UK

¹⁷It is important to highlight that standard measures of financial uncertainty, i.e., the VIX, or Bloom’s measure of UK policy uncertainty reveal only a temporary spike at the time of the Brexit vote. See the figure in Appendix C. For evidence on the relationship of risk with capital flows, see Forbes and Warnock (2012); with bank lending, see Bruno and Shin (2015); and with the global financial cycle, see Rey (2015) and Miranda-Agrippino and Rey (2015).

¹⁸Our empirical results are not dependent on different specifications of fixed effects.

increased after the Brexit vote. This would be inconsistent with Carney’s (2017) warning; however, debt and equity outflows in light of the weakening GBP would be consistent with portfolio rebalancing; see Hau and Rey (2004) and Fischer et al. (2021). The case for $\beta \leq 0$ for $\ln(X_{i,c,t})$ defined by Swiss capital inflows for UK firms residing in Switzerland suggests that UK firms repatriated their assets from Switzerland to the UK. This would be consistent with the claim by Gourinchas and Rey (2007) and Cavallo and Tille (2006) that states foreign investment gains stabilize the UK current account deficit. Carney (2017) is silent on repatriation flows. The last case is $\beta > 0$ for $\ln(X_{i,c,t})$ defined by Swiss capital inflows from the UK to Switzerland suggests that UK firms increased their investment abroad. Again, Carney (2017) is not concerned about the behavior of UK firm investments abroad.

[Table 6 Coefficient interpretation here]

5 Empirical Analysis

This section presents the empirical results based on equation (1). The first set of findings documents the dynamics of capital in- and outflows in our sample of all firms as well as of banks and finance companies and non-banks and non-finance companies separately. Thereafter, the findings for capital in- and outflows for different subcomponents are discussed. These include regression results that control for firm size, firm nationality, currency domination, and different investment categories.

The empirical findings suggest that firms in Switzerland did not respond

uniformly to the Brexit shock.¹⁹ More importantly, the evidence does not support the view that a broad-based decline in capital outflows from Switzerland to the UK occurred; nor is there broad-based evidence that UK assets in Switzerland were repatriated by British-controlled firms residing in Switzerland. Furthermore, evidence of level shifts in various subcomponents of capital flows may be consistent with heterogeneous behavior among investors as outlined in Davis and van Wincoop (2022).

5.1 Baseline Results

Table 7 presents baseline regressions of the Brexit shock on capital in- and outflows, respectively, based on equation (1) for three categories: all firms; banks and finance firms (B & F); and non-banks and non-finance firms (Non-B & Non-F). The coefficient estimates of the interaction term, $Post_t * UK_c$, do not support a pullback view of Swiss investment in the UK or UK investment in Switzerland after the Brexit vote. First, in Table 7 (left hand side), coefficient estimates for all firms and Non-B & Non-F firms show that capital outflows increased (coefficient estimates range between 0.06 and 0.09) after the Brexit vote. Only the coefficients for Non-B & Non-F firms are statistically significant at the 5% level. Second, the coefficient estimate for B & F firms is negative, -0.08, suggesting that capital outflows fell after the Brexit vote. Although the coefficient is not statistically significant, to interpret whether this reduction in capital outflows is consistent with the “kindness

¹⁹As a separate check to determine whether our empirical framework is robust in capturing capital flow responses to alternative shocks, the effect of the US Tax Cut and Jobs Act on capital outflows to the US are considered in Appendix D.

of strangers” hypothesis in a bilateral setting, in the next subsection, we examine more deeply the role of firm heterogeneity in the context of firm characteristics.

[Table 7 Baseline results here]

The previously discussed empirical results are reconfirmed by a regression that interacts a time trend (instead of the $Post_t$ dummy with the UK_c country dummy. Figures 3 and 4 plot the time trend coefficient estimates and their averages (red line) for the pre- and post-Brexit-vote period for in- and outflows, respectively. Bold dots denote statistical significance at the 5% level. The average of the coefficient estimates of the interaction of time with UK_c shows that the capital outflows are slightly smaller for the post-Brexit-vote period for B & F firms and increase in the case of Non-B & Non-F firms.

[Figure 3 Parallel trend outflows here]

[Figure 4 Parallel trend inflows here]

Table 7 (right hand side) also shows that the capital inflows behaved similarly to the capital outflows. This finding in itself is unsurprising given the high positive correlation between the two flows. In the face of a large macro shock, such as the Brexit vote, the correlation findings of Broner et al. (2013) and Davis and van Wincoop (2018) appear to hold. Important to stress is that the (insignificant) coefficient estimates of all firms are greater for capital outflows than for capital inflows.

The estimate of the interaction coefficient for capital inflows is -0.25, which is smaller than the estimate of -0.08 for capital outflows. This evidence suggests that the repatriated capital inflows to the UK were greater than the increase in the Swiss capital outflows to the UK. Figure 4, as in Figure 3, reconfirms these findings for B & F firms and Non-B & Non-F firms. The fall in the average time trend estimates for B & F firms is considerably greater in Figure 4 than that for the capital outflows shown in Figure 3. Similarly, the average time trend coefficients of capital inflows for Non-B & Non-F firms jumps slightly less than those for the capital outflows shown in Figure 3.

Table 8 shows the results of the baseline regression when net bilateral flows are used as the dependent variable instead of gross bilateral in- and outflows as reported earlier. The coefficient estimate of the interaction term for net capital flows is statistically insignificant at conventional critical levels. Thus in net terms, there is no evidence that net capital flows between Switzerland and the UK changed following the Brexit shock.²⁰ This is also confirmed by the figures presented in Appendix B illustrating aggregate capital flows.

[Table 8 Baseline results for net flows here]

5.2 The role of firm characteristics

To interpret the behavior of capital in- and outflows in the previous subsection, in this subsection, we examine the role of firm characteristics in cross-border flows. The regressions control for firm nationality (country of control

²⁰Granular and high-frequency data from other sources are in line with this pattern. In particular, investment fund flows to the UK do not decline following the Brexit shock.

of the firm resident in Switzerland), firm size, currency denomination of capital in- and outflows, and type of investment (debt versus equity). These regressions reveal a heterogeneous picture, suggesting that firms residing in Switzerland did not respond uniformly to the Brexit shock.

Table 9 presents regressions based on equation (1) that control for firm nationality in Switzerland. Firm nationality can be the UK, US, Switzerland, EU or the rest of the world (ROW). The coefficients for the variable of interest for capital outflows in the left panel range between -0.05 and 0.3. The coefficient for $Post_t * UK_c$ for British-controlled firms in Switzerland is 0.3 and statistically insignificant, while the same coefficients for the US-, Swiss-, and EU-controlled firms are all smaller in absolute value and statistically insignificant. The rest of the world's firms behave similarly to UK firms. The difference in the coefficient estimates across different firm nationalities suggests that common national ties can be important to explaining the increase in capital outflows observed in Table 7.

The right-hand-side panel of Table 9 presents the capital inflow regressions that control for firm nationality. Each of the coefficient estimates for $Post_t * UK_c$ is small and statistically insignificant, except for the ROW firms. This finding suggests that firm groupings by nationality are unable to explain the earlier result in Table 7 that capital inflows increased after the Brexit vote. The result also suggests that the response of repatriation flows by British-controlled firms to the Brexit vote was minimal and that there was homogeneous behavior across firms of different nationalities.

[Table 9 Baseline regression by firm nationality here]

It is well recognized that firms ranked by their size respond differently to aggregate shocks. Di Giovanni et al. (2020), motivated by Gabaix (2011), show that large international firms respond more strongly to macroeconomic shocks as a result of their international linkages. This granular view of macroeconomic shocks contends that the behavior of large firms accounts for a large share of business cycle movements. Although our sample is too short in the time dimension to make statements about business cycles, it is still germane to determine whether the response to the Brexit vote via capital in- and outflows are concentrated in large firms.

Table 10 presents regressions controlling for firm size. Firm size is measured by the number of employees and is classified into three categories: small (fewer than 50 employees in 2016), medium (more than 50 and fewer than 250 employees in 2016), and large (more than 250 employees in 2016). We group firms without employment information as nonreporting (NR). There is weak evidence that capital outflows from smaller firms resident in Switzerland to the UK increased after the Brexit vote. The coefficient estimates of $Post_t * UK_c$ for medium and large firms are statistically insignificant. In contrast, Table 10 documents that capital inflows from the UK to all firms in Switzerland irrespective of their size did not statistically change following the Brexit vote.

[Tables 10 firm size here]

Next, the role of currency denomination is considered. Tables 11 to 14 present regressions that control for the currency denomination of capital in- and outflows. The empirical findings for the coefficient of interest are

mixed. First, Table 11 shows that the estimates of $Post_t * UK_c$ for capital outflows denominated in USD are approximately 0.05 and statistically significant for all firms and Non-B & Non-F firms. This result for Non-B & Non-F firms is consistent with studies by Gopinath et al. (2020) and Gopinath and Stein (2018) that show the widespread occurrence of dollar dominance in the invoicing of international goods trade. Second, the strong role of GBP-denominated capital inflows to B & F firms shown in Table 12 contrasts with the USD-denominated capital outflows by Non-B & Non-F firms in Table 11. The coefficient of $Post_t * UK_c$ for both GBP inflows and GBP outflows is -0.17, suggesting that repatriated capital inflows were exchange rate neutral. Third, the response of capital in- and outflows denominated in EUR and CHF shown in Tables 13 and 14 were muted and statistically insignificant.

[Tables 11 12 13 14 Baseline regression by currency denominations here]

Recently, Blanchard et al. (2017) put forth the view that the nature of a country's capital inflows impacts output growth differently. They argue that bonds or debt are contractionary, because the country's exchange rate appreciates as capital inflows increase. However, the returns on alternative flows, such as equity, decline and are therefore potentially expansionary. Similarly, Chari et al. (2021) argue that the separation between debt and equity matters for understanding US spillover effects on capital flows in EMEs. Their study finds that equity returns in EMEs respond more strongly to US monetary policy shocks than do debt valuations.

Tables 15 and 16 present regression evidence for debt and equity flows separately. The coefficient estimates suggest that debt flows through Non-B

& Non-F firms were the primary channel for capital in- and outflows after Brexit. The coefficient estimates for debt in- and outflows for Non-B & Non-F firms are positive and statistically significant. For equity flows the evidence is inconclusive. This finding suggests that the debt channel put (offsetting) appreciating pressures on the GBP-CHF exchange rate.

[Tables 15 and 16 here]

Tables 17 and 18 suggest that firms resident in Switzerland increased their foreign investment in the UK particularly via short-term debt instruments.

[Tables 17 and 18 here]

6 Conclusions

The empirical findings at the firm level suggest that the Brexit shock did not disrupt cross-border flows between the UK and Switzerland. Firm heterogeneity in response to the Brexit shock does not appear to be a primary explanatory factor. This result sharply contrasts with other microdata studies that use the Brexit vote as their economic shock. Trade frictions, as argued by Chen et al. (2022), Corsetti et al. (2022), and Fernandes and Winters (2021), and immigration sentiment, as argued by Colantone and Stanig (2018), are strongly linked to the timing of the Brexit vote.

Our empirical findings suggest that the “kindness of strangers” warning by Carney (2017) appears to have been overly cautious, at least for our bilateral setting. First, capital inflows and outflows are positively correlated not only in the bilateral context but also in aggregate as the UK’s current

account adjusted. More importantly, the positive correlation between in- and outflows appears to hold across a range of subgroupings at the firm level. The parallel behavior of capital flows in gross assets and liabilities documented in Broner et al. (2013) and Davis and van Wincoop (2018) is also present at the firm level in the face of a large shock. Second, Carney (2017) focuses strictly on foreign willingness to invest in the UK after the Brexit vote; however, the alternative channel of repatriating capital inflows from abroad is also important. British-controlled firms residing in Switzerland repatriated some of their foreign assets to the UK. Third, the nonuniform response to the Brexit vote by B & F firms and Non-B & Non-F firms residing in Switzerland suggests that capital waves as defined by Forbes and Warnock (2021, 2012) at the aggregate level mask important compositional differences in firm size and nationality.

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Appendix

A. Sample of destination countries for asset and liability flows

The sample selection of 57 countries is based on the top 50 countries in which our sample of companies have foreign assets and the top 50 countries in which they have foreign liabilities. The merger of these two sets results in 57 countries. This criterion captures almost all capital inflows and outflows in our sample. In other words, bilateral financial relationships between Switzerland and the excluded countries are negligible. For example, as of 2016:Q4, the total outflows of our sample of companies to these 57 countries amounted to CHF 1.97 billion. This amount captures 97% of the total outflows. Similarly, for the same quarter, the total inflows of our sample of companies from the selected 57 countries amounted to 1.58 billion. This amount captures 99.3% of the total inflows.

List of 57 countries: United Arab Emirates, Argentina, Austria, Australia, Belgium, Bermuda, Brazil, Bahamas, Canada, Chile, China, Colombia, Curacao, Cyprus, Czech Republic, Germany, Denmark, Egypt, Spain, Finland, France, United Kingdom, Guernsey, Gibraltar, Hong Kong SAR, Hungary, Indonesia, Ireland, Israel, India, Italy, Jersey, Japan, Korea, Cayman Islands, Luxembourg, Malta, Mauritius, Mexico, Malaysia, Netherlands, Norway, Panama, Poland, Romania, Russia, Saudi Arabia, Sweden, Singapore, Thailand, Turkey, Chinese Taipei, Ukraine, United States, Venezuela, Virgin Islands, South Africa.

B. Aggregate capital flows

This section presents figures summarizing gross and net capital flows for Switzerland in aggregate, bilateral flows between the UK and Switzerland, flows by UK-controlled firms, flows by large firms, and flows denominated in GBP in our sample. There is no evidence in the data that aggregate capital flows between the UK and Switzerland declined following the Brexit shock.

Figure B1: Total Swiss Flows Over Time

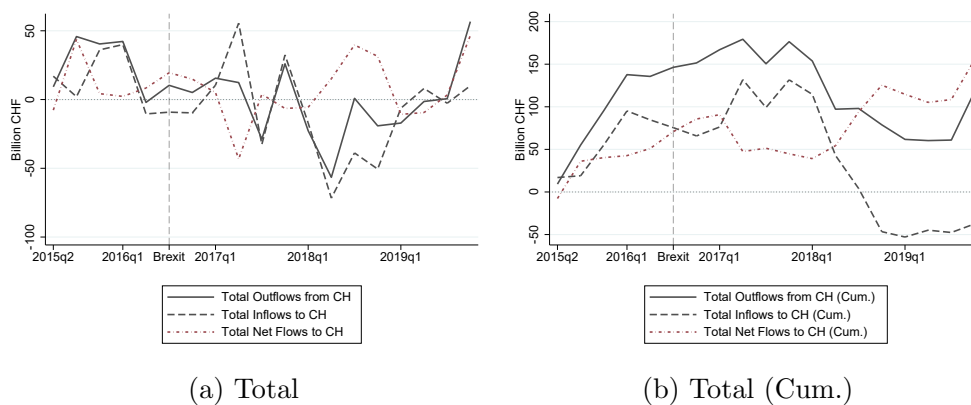
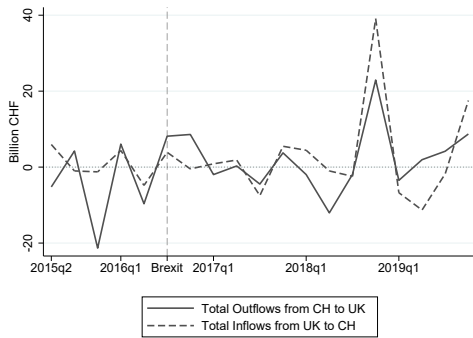
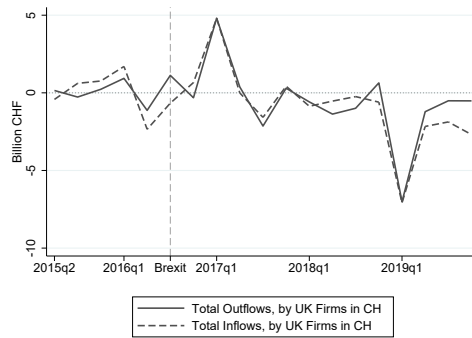


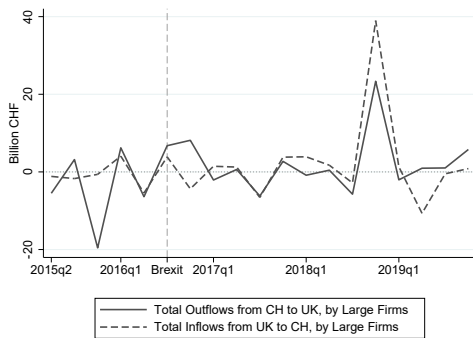
Figure B2: Total (Bilateral) Flows Over Time [UK]



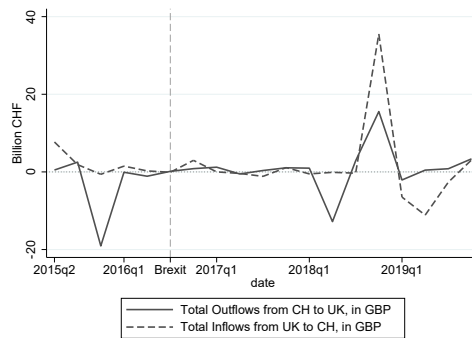
(a) Total



(b) UK-owned Firms

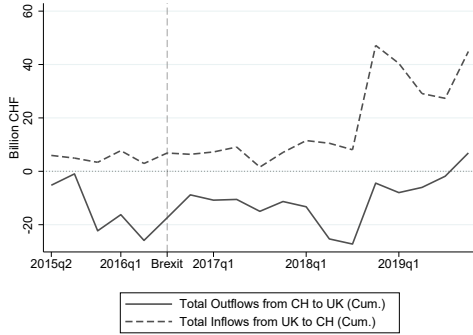


(c) Large Firms

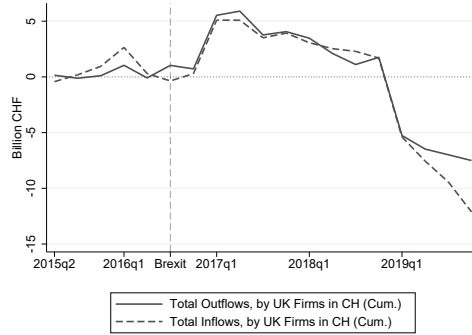


(d) GBP

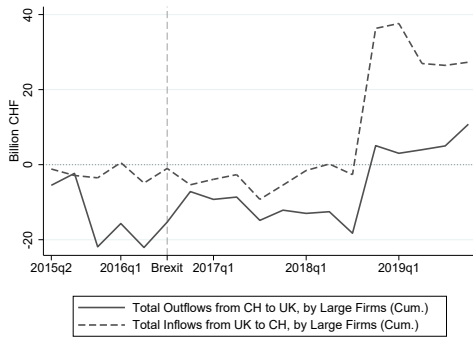
Figure B3: Cumulative Total (Bilateral) Flows Over Time [UK]



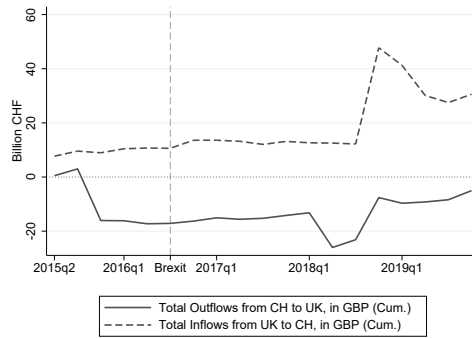
(a) Total



(b) UK-owned Firms



(c) Large Firms

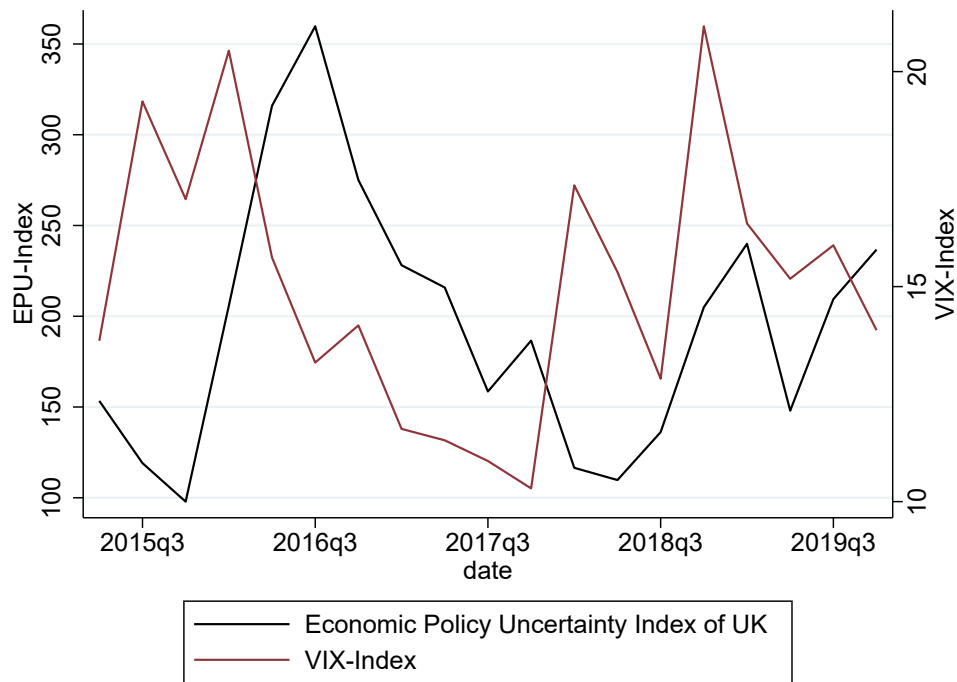


(d) GBP

C. Temporary Brexit uncertainty: Plot of UK EPU and VIX

Figure C4 illustrates VIX, the uncertainty series taken from Fred (Federal Reserve Bank of St. Louis), and the economic policy uncertainty (EPU) index of the UK, taken from <https://www.policyuncertainty.com/>. See also Baker et al. (2016). Robustness checks using these two series instead of the interaction term between a Post-Brexit-vote dummy and a UK country dummy gave insignificant results.

Figure C4: Economic Policy Uncertainty Index of the UK versus VIX



D. Estimates for the US Tax Cuts and Jobs Act

To determine whether our empirical strategy has power in identifying changes in capital flows in response to policy changes, the effects of the 2017 US Tax Cut and Jobs Act (TCJA) are considered with our dataset. The TCJA reduced corporate taxes from 35% to 21%. This tax reduction sought to increase domestic investments through the repatriation of foreign capital held abroad by US firms. In our dataset, we should expect capital outflows from Switzerland by US-controlled firms residing in Switzerland to increase and capital inflows to Switzerland from the US to decrease.

Equation (1) is replaced with

$$\ln(X_{i,c,t}) = \beta(TAX_t * US_c) + \delta_t * \alpha_i + \zeta_c + \epsilon_{i,c,t}, \quad (2)$$

where US_c is a dummy that flags capital flows to and from the US and TAX_t is a dummy that is one after 2018:Q1 until 2019:Q4 and zero otherwise.

The empirical results for B & F firms and Non-B & Non-F firms are given in the tables below. Table D1 show that outflows of US-controlled B & F firms residing in Switzerland increased after the TCJA. The estimated coefficient of 0.552 is statistically significant at the 10% level. The estimated coefficient of B & F firms in Switzerland with other nationalities are negative (except the EU) and are not statistically significant. The estimate of the interaction term for capital inflows of US-controlled B & F firms is negative but not statistically significant. Furthermore, the estimated coefficient for US-controlled firms' net flows is positive and statistically significant in Table D3. These findings are consistent with the priors.

The estimates of Non-B & Non-F firms do not suggest that US firms residing in Switzerland responded to the TCJA.

Table D1: US TCJA: Banks and finance companies: Nationality

	Outflows					Inflows				
	(1) UK	(2) US	(3) CH	(4) EU	(5) ROW	(6) UK	(7) US	(8) CH	(9) EU	(10) ROW
Post Tax x US	-0.250 (0.423)	0.552* (0.257)	-0.296 (0.209)	0.016 (0.044)	-0.088 (0.138)	-0.095 (0.085)	-0.330 (0.239)	-0.003 (0.063)	0.152 (0.158)	0.001 (0.005)
Observations	8550	11913	18411	29355	17328	8550	11913	18411	29355	17328
R^2	0.031	0.030	0.039	0.041	0.024	0.052	0.028	0.019	0.063	0.023

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms
 Clustered standard errors at the firm level in parentheses.
 ***, **, * denote significance at the 1, 5, and 10% level.

Table D2: US TCJA: Non-banks and non-finance companies: Nationality

	Outflows					Inflows				
	(1) UK	(2) US	(3) CH	(4) EU	(5) ROW	(6) UK	(7) US	(8) CH	(9) EU	(10) ROW
Post Tax x US	0.031 (0.232)	0.069 (0.117)	0.141 (0.110)	-0.063 (0.077)	-0.084 (0.118)	-0.010 (0.156)	-0.112 (0.123)	-0.023 (0.066)	-0.029 (0.059)	-0.081 (0.129)
Observations	10659	73359	140391	116622	51015	10659	73359	140391	116622	51015
R^2	0.033	0.043	0.048	0.051	0.047	0.024	0.047	0.046	0.034	0.041

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms
 Clustered standard errors at the firm level in parentheses.
 ***, **, * denote significance at the 1, 5, and 10% level.

Table D3: US TCJA: net flows Banks and Finance companies: Nationality

	Net Flows				
	(1) UK	(2) US	(3) CH	(4) EU	(5) ROW
Post Tax x US	0.054 (0.173)	0.672* (0.359)	-0.399* (0.192)	-0.178 (0.139)	-0.088 (0.140)
Observations	8550	11913	18411	29355	17328
R^2	0.027	0.026	0.030	0.019	0.019

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms

Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

Table D4: US TCJA: net flows Non-banks and non-finance companies: Nationality

	Net Flows				
	(1) UK	(2) US	(3) CH	(4) EU	(5) ROW
Post Tax x US	0.005 (0.304)	0.132 (0.138)	0.146 (0.117)	0.039 (0.090)	0.002 (0.159)
Observations	10659	73359	140391	116622	51015
R^2	0.025	0.035	0.040	0.032	0.031

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms

Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

E. Regression results for net flows controlling for firm characteristics

This section presents regression results when net flows are used as the dependent variable while controlling for firm characteristics. The regressions show that the baseline results for net flows do not change when firm characteristics are taken into account. Net flows from CH to the UK do not drop after the Brexit shock. On the contrary, net flows by small companies increase slightly.

Table E1: Net Flows by Firm Nationality

	Net Flows				
	(1) UK	(2) US	(3) CH	(4) EU	(5) ROW
Post x UK	0.229 (0.273)	0.062 (0.121)	0.054 (0.080)	-0.086 (0.065)	0.045 (0.129)
Observations	19209	85272	158802	145977	68343
R^2	0.023	0.032	0.038	0.030	0.029

Sample based on all companies. Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

Table E2: Net Flows by Firm Size

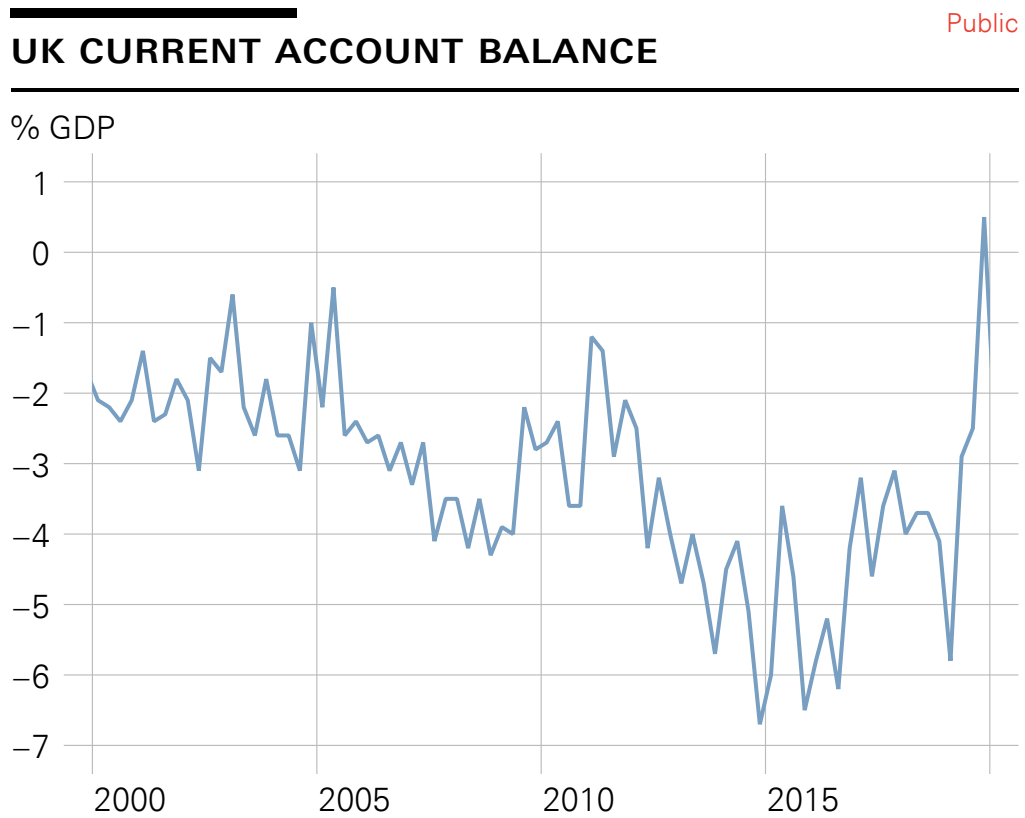
	Net Flows			
	(1) Small	(2) Medium	(3) Large	(4) NR
Post x UK	0.183* (0.105)	0.171 (0.144)	-0.067 (0.069)	0.014 (0.080)
Observations	53067	63897	207936	152703
R^2	0.025	0.027	0.040	0.027

Sample based on all companies. Clustered standard errors at the firm level in parentheses. Small (between 1 and 49 employees), medium (between 50 and 249 employees) or large (more than 250 employees). Firms that do not report any or report zero employment are classified as nonreporting (NR).

***, **, * denote significance at the 1, 5, and 10% level.

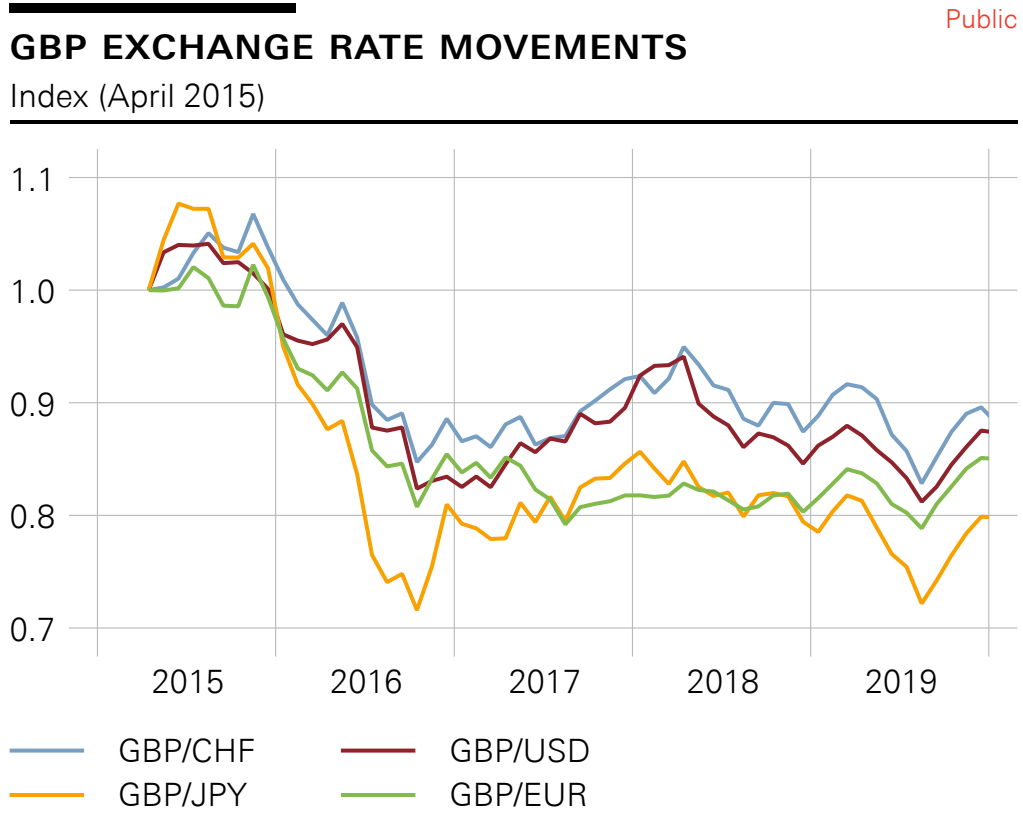
Figures and Tables

Figure 1: UK current account balance



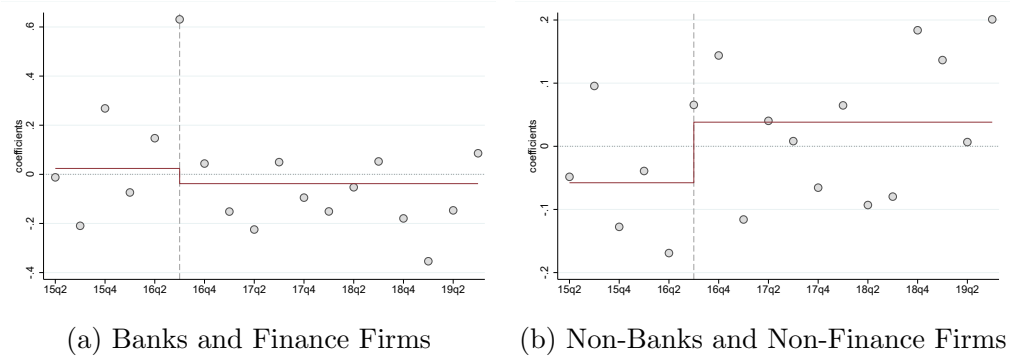
Source: British Office for National Statistics (ONS)

Figure 2: Brexit shock for GBP vis-à-vis major currencies



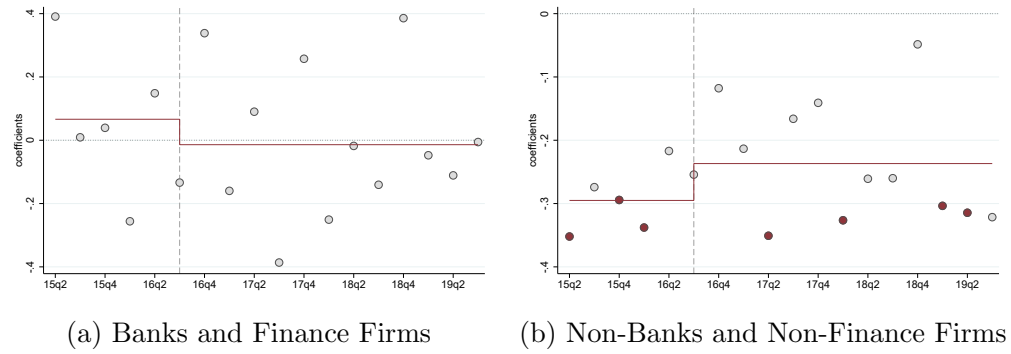
Source: British Office for National Statistics (ONS)

Figure 3: Time-trend Coefficients - Outflows



Note: Solid red dots indicate coefficients that are significant at the 5% level.

Figure 4: Time-trend Coefficients - Inflows



Note: Solid red dots indicate coefficients that are significant at the 5% level.

Table 1: Summary Statistics

	B & F		Non-B & Non-F	
	Pre-Brexit	Post-Brexit	Pre-Brexit	Post-Brexit
Number of firms	79	79	362	362
Number of observations	22515	63042	103170	288876
Total	85557	85557	392046	392046
Number of observed non-zero flows to UK	95	281	1026	3039
Total	376	376	4065	4065
Number of non-zero flows denominated in GBP	181	484	2107	5792
Total	665	665	7899	7899
Average quarterly Outflows	1.6	-.4	1	0
Total	.1	.1	.3	.3
Average quarterly Inflows	1	-1	.6	-.2
Total	-.5	-.5	0	0
Average quarterly Outflows to the UK	2.3	-.1	-14.8	6.5
Total	.5	.5	.9	.9
Average quarterly Inflows from the UK	18.5	-9.1	-2.4	10.3
Total	-1.8	-1.8	6.9	6.9
Average quarterly variance Outflows	18513.0	35103.5	32679.8	37286.1
Total	30737.6	30737.6	36073.9	36073.9
Average quarterly variance Inflows	12067.5	34165.8	21148.4	53206.8
Total	28350.5	28350.5	44770.4	44770.4

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms

Table 2: Summary Statistics on UK Exposure

	Assets		Liabilities	
	Pre-Brexit (as of 2016q2)	Post-Brexit (as of 2019q4)	Pre-Brexit (as of 2016q2)	Post-Brexit (as of 2019q4)
Share of Firms with UK Exposure (% in Total)	60.3	61.9	47.6	49.7
Share of UK Stocks (% in Total)	4.1	5.9	4.9	8.6

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms

Table 3: Summary Statistics on Nationality of Firms

	B & F		Non-B & Non-F	
	Pre-Brexit (as of 2016q2)	Post-Brexit (as of 2019q4)	Pre-Brexit (as of 2016q2)	Post-Brexit (as of 2019q4)
CH	17	17	132	127
EU	27	27	109	110
ROW	16	16	45	47
UK	8	8	8	11
US	11	11	68	67

B & F: Banks and Finance Companies; Non-B & Non-F: Non-Banks and Non-Finance Companies

The table displays the number of banks/finance and non-bank/non-finance companies per nationality (CH, EU, UK, US and ROW) in 2016Q2 as the reference quarter prior to the Brexit vote and in 2019Q4 as the reference quarter after the Brexit vote (end of sample).

Table 4: Summary Statistics on Size of Firms

	B & F				Non-B & Non-F			
	Small	Medium	Large	NR	Small	Medium	Large	NR
Count	8	10	22	39	41	49	170	102

B & F: Banks and Finance Companies; Non-B & Non-F: Non-Banks and Non-Finance Companies

The table shows the number of banks/finance and non-bank/non-finance companies classified according to their number of employees in 2016: small (between 1 and 49 employees), medium (between 50 and 249 employees) or large (more than 250 employees). Firms that do not report any or report zero employment are classified as non-reporting (NR).

Table 5: Correlations between Inflows and Outflows

	CH	CH-UK	CH: UK Firms	CH-UK: Large Firms	CH-UK: GBP
Inflow-Outflow Correlation	.74	.64	.91	.67	.55
Inflow-Outflow Correlation (Cum.)	.79	.6	.97	.82	.3

CH: capital flows to and from our sample of companies

CH-UK: capital flows between Switzerland and the UK in our sample of companies

CH: UK Firms: capital flows to and from companies in our sample that are British-controlled

CH-UK: Large firms: capital flows between Switzerland and the UK in our sample of companies with more than 250 employees

CH-UK: GBP: GBP-denominated capital flows between Switzerland and the UK in our sample of companies

Table 6: Interpreting β in equation (1)

sign	$\ln(X_{i,c,t})$ in equation (1)	Consistent with Carney (2017)
$\beta < 0$	Outflow from CH to UK	yes
$\beta \geq 0$	Outflow from CH to UK	no
$\beta \leq 0$	Inflow from UK to CH	no
$\beta > 0$	Inflow from UK to CH	no

Table 7: Baseline results: Gross flows

	Outflows			Inflows		
	(1) All	(2) B & F	(3) Non-B & Non-F	(4) All	(5) B & F	(6) Non-B & Non-F
Post x UK	0.066 (0.041)	-0.059 (0.097)	0.093** (0.046)	0.047 (0.039)	-0.079 (0.091)	0.075* (0.043)
Observations	477603	85557	392046	477603	85557	392046
R^2	0.045	0.030	0.047	0.041	0.039	0.042

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms
 Clustered standard errors at the firm level in parentheses.
 ***, **, * denote significance at the 1, 5, and 10% level.

Table 8: Baseline results: Net flows

	Net Flows		
	(1)	(2)	(3)
	All	B & F	Non-B & Non-F
Post x UK	0.018 (0.046)	-0.083 (0.085)	0.041 (0.052)
Observations	477603	85557	392046
R^2	0.033	0.020	0.035

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms

Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

Table 9: Firm Nationality

	Outflows					Inflows				
	(1) UK	(2) US	(3) CH	(4) EU	(5) ROW	(6) UK	(7) US	(8) CH	(9) EU	(10) ROW
Post x UK	0.299 (0.179)	0.108 (0.107)	0.045 (0.070)	-0.044 (0.057)	0.239* (0.130)	-0.031 (0.206)	-0.017 (0.091)	0.024 (0.063)	0.021 (0.062)	0.276* (0.141)
Observations	19209	85272	158802	145977	68343	19209	85272	158802	145977	68343
R^2	0.031	0.040	0.046	0.049	0.046	0.029	0.043	0.045	0.038	0.039

Sample based on all companies.

Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

Firm nationality is based on the location of the ultimate controlling entity (CH, EU, UK, US and ROW).

Table 10: Firm Size

	Outflows				Inflows			
	(1) Small	(2) Medium	(3) Large	(4) NR	(5) Small	(6) Medium	(7) Large	(8) NR
Post x UK	0.202* (0.106)	0.095 (0.132)	-0.021 (0.065)	0.126* (0.068)	-0.062 (0.085)	0.031 (0.070)	0.082 (0.063)	0.046 (0.075)
Observations	53067	63897	207936	152703	53067	63897	207936	152703
R^2	0.036	0.040	0.049	0.044	0.025	0.036	0.051	0.031

Sample based on all companies.

Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

Firm size classification is based on the number of employees in 2016: small (between 1 and 49 employees), medium (between 50 and 249 employees) or large (more than 250 employees). Firms that do not report any or report zero employment are classified as nonreporting (NR).

Table 11: USD

	Outflows			Inflows		
	(1) All	(2) B & F	(3) Non-B & Non-F	(4) All	(5) B & F	(6) Non-B & Non-F
Post x UK	0.046** (0.023)	0.001 (0.023)	0.056** (0.027)	0.044 (0.027)	0.024 (0.048)	0.048 (0.031)
Observations	477603	85557	392046	477603	85557	392046
R^2	0.035	0.019	0.037	0.034	0.025	0.035

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms

Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

Table 12: GBP

	Outflows			Inflows		
	(1) All	(2) B & F	(3) Non-B & Non-F	(4) All	(5) B & F	(6) Non-B & Non-F
Post x UK	-0.007 (0.033)	-0.173* (0.098)	0.029 (0.034)	-0.025 (0.027)	-0.150* (0.087)	0.003 (0.027)
Observations	477603	85557	392046	477603	85557	392046
R^2	0.025	0.018	0.026	0.025	0.020	0.027

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms
 Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

Table 13: EUR

	Outflows			Inflows		
	(1) All	(2) B & F	(3) Non-B & Non-F	(4) All	(5) B & F	(6) Non-B & Non-F
Post x UK	0.014 (0.021)	0.037 (0.044)	0.008 (0.024)	0.006 (0.015)	-0.000 (0.024)	0.007 (0.017)
Observations	477603	85557	392046	477603	85557	392046
R^2	0.036	0.029	0.037	0.035	0.027	0.037

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms
 Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

Table 14: CHF

	Outflows			Inflows		
	(1) All	(2) B & F	(3) Non-B & Non-F	(4) All	(5) B & F	(6) Non-B & Non-F
Post x UK	-0.007 (0.012)	-0.020 (0.034)	-0.004 (0.013)	0.023 (0.017)	0.005 (0.027)	0.027 (0.019)
Observations	477603	85557	392046	477603	85557	392046
R^2	0.055	0.016	0.056	0.032	0.024	0.032

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms
 Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

Table 15: Debt and Equity Outflows

	Debt			Equity		
	(1) All	(2) B & F	(3) Non-B & Non-F	(4) All	(5) B & F	(6) Non-B & Non-F
Post x UK	0.058 (0.039)	-0.046 (0.091)	0.081* (0.044)	0.005 (0.016)	-0.015 (0.034)	0.009 (0.018)
Observations	477603	85557	392046	477603	85557	392046
R^2	0.046	0.030	0.047	0.035	0.033	0.035

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms
 Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

Table 16: Debt and Equity Inflows

	Debt			Equity		
	(1) All	(2) B & F	(3) Non-B & Non-F	(4) All	(5) B & F	(6) Non-B & Non-F
Post x UK	0.059 (0.039)	-0.037 (0.092)	0.080* (0.043)	-0.006 (0.012)	-0.024 (0.052)	-0.002 (0.010)
Observations	477603	85557	392046	477603	85557	392046
R^2	0.043	0.043	0.043	0.016	0.017	0.016

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms
 Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

Table 17: Short-term versus long-term debt outflows

	Short-term Debt			Long-term Debt		
	(1) All	(2) B & F	(3) Non-B & Non-F	(4) All	(5) B & F	(6) Non-B & Non-F
Post x UK	0.050* (0.027)	0.039 (0.054)	0.052* (0.030)	0.002 (0.038)	-0.158 (0.110)	0.037 (0.040)
Observations	477603	85557	392046	477603	85557	392046
R^2	0.041	0.038	0.042	0.044	0.026	0.046

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms
 Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

Table 18: Short-term versus long-term debt inflows

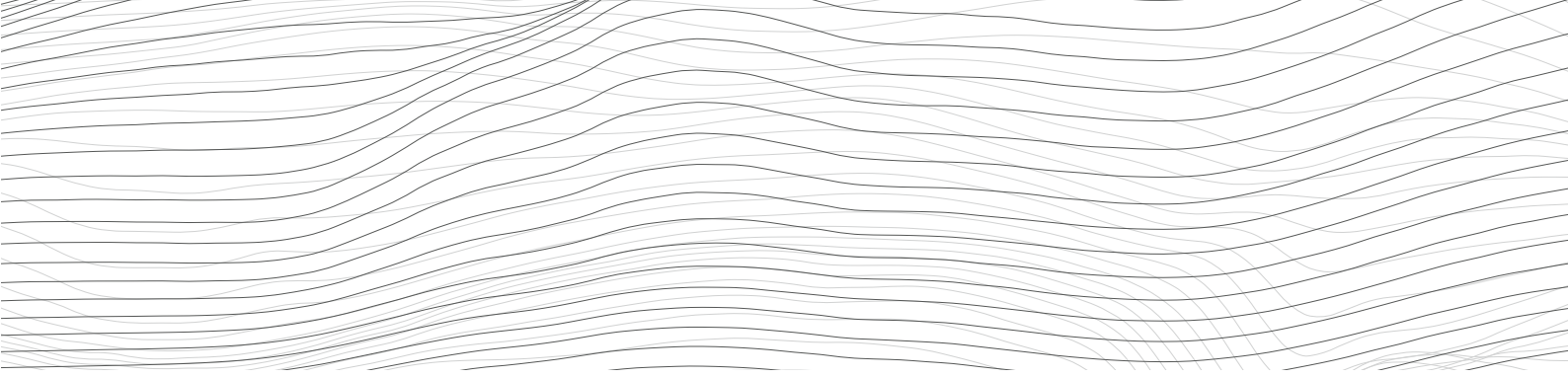
	Short-term Debt			Long-term Debt		
	(1) All	(2) B & F	(3) Non-B & Non-F	(4) All	(5) B & F	(6) Non-B & Non-F
Post x UK	0.028 (0.024)	-0.010 (0.038)	0.037 (0.028)	0.014 (0.035)	-0.051 (0.094)	0.028 (0.037)
Observations	477603	85557	392046	477603	85557	392046
R^2	0.044	0.020	0.044	0.042	0.045	0.042

B & F: Banks and Finance Firms; Non-B & Non-F: Non-Banks and Non-Finance Firms
 Clustered standard errors at the firm level in parentheses.

***, **, * denote significance at the 1, 5, and 10% level.

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