The Kindness of Strangers: Brexit and Bilateral Financial Linkages*

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March 9, 2023

*We thank participants at the SNB brownbag seminar for useful suggestions. We also thank Alexander Flühmann and Patrick Lengg for helpful discussions on the data used in this paper. Leyla Beck, Victoria Otten, Sofia Schroeter and Izabela Wnuk provided excellent research assistance at various stages of this project. The views, opinions, findings, and conclusions or recommendations expressed in this paper are strictly those of the author(s). They do not necessarily reflect the views of the Swiss National Bank (SNB). The SNB takes no responsibility for any errors or omissions in, or for the correctness of, the information contained in this paper.

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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. The paper examines 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 focuses strictly on the foreign willingness to invest in the UK, however, the alternative channel of repatriating British assets abroad is equally important. Second, capital in- and outflows are positively correlated not only in the aggregate, but also across a range of sub-groupings at the firm level. Third, the non-uniform 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's (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) fear 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 hold assets issued by the domestic economy. An alternative channel not highlighted by Carney's warning is through capital gains on sales of past foreign investments undertaken by domestic agents. Disentangling the two channels to test Carney's conjecture 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 firm's cross-border in- and outflows to the Brexit shock separately.

This paper investigates the "kindness of strangers" hypothesis with re-

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

[2]The 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 calculating balance of payments data in 1948.

[3]Ratings agency Moody's cut the United Kingdom's debt rating on October 16, 2020 citing 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. Also the IMF's external sector report (2021) repeatedly emphasized that the UK external sector between 2013 to 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-difference 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 cross-border capital linkages survey. The data, examined for the first time in this study, is 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 country. 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) has argued in the US case that a low do-

mestic 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 Melisi-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 (2021) 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 investment to the UK is limited at best. Carney's (2017) "kindness-of-strangers" narrative appears to be 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 in- and outflows are positively correlated across a range of sub-components at the firm level. 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

[4]Although 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 and thus Brexit restricted the immigration flow between the two countries.

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 GBP-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).

This paper makes three contributions to the large literature on cross-border capital flows. A first contribution lies in presenting new evidence in the realm of international financial adjustment. The events surrounding current account adjustment in the post-Brexit-vote period are similar to the discussion of US current account sustainability in 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.

A 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 to be the two main drivers of international capital flows. Avdjiev et al. (2020) recently re-confirm 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 between the advanced economies and better capitalized banks with lower exposure to global risks. Although the Brexit shock does not fit the capital flows driver of US monetary policy, this shock represents an increase in the country risk premium with potential global implications. Our empirical evidence however suggests that country specific shocks outside of the US do not always unleash sudden cross-border outflows between advanced economies.

The third contribution extends the growing literature on Brexit and trade to financial linkages. The 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 use 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 of the British pound at the time of the Brexit vote to be 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 Fetzer (2019) argues that domestic fiscal policy in the previous years was responsible for the leave outcome. Becker et al. (2017), Dustmann et al. (2017), Dijkstra

et al. (2020) note that socio-economic factors were also important in the Brexit outcome. Regardless as to how the channels of the Brexit shock are defined, we show with micro-data that the timing of 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 the 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." Carney's 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 all 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 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 mem-

[5]Carney (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).

bership 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 that is defined by a new international regulatory environment, whereas Bruno and Shin (2015) and Gourinchas and Obstfled (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 and this 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 of these developments are not part of Carney's (2017) narrative of the UK's increased external vulnerability after the Brexit vote. Second, Carney's (2017) warning of increased UK external vulnerability best resembles the debate of 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 determinants of capital flows arising from a diversified portfolio change quickly and massively in the face of a single country shock such as the Brexit vote.

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. It 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 the Freund and Warnock (2007) reversal definition, partially mitigates Carney's (2017) warning of the "kindness of strangers." However, it must be remembered that Carney warned on numerous occasions that a current account-to-GDP ratio of -3% was regarded to be still too high.

[Figure 1 UK CA here]

The current account reversal coincides with a large depreciation in the GBP. Figure 2 plots the GBP against four major currencies: USD, EUR, JYN, and 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 Swiss franc 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 the other major currencies. First, financial linkages between the UK and the US (i.e., ranked first inward FDI position to the UK in 2019), Japan (second), and the euro area (third) are stronger than between the UK and Switzerland (fifth after Jersey). Second, the Swiss franc experienced its own exchange rate shock after the Swiss National Bank (SNB) lifted its 1.2 floor to the euro in January 2015.[6] The Swiss franc appreciated by more than 13% against the GBP on January 15, 2015. Thereafter, Swiss monetary policy was extremely expansionary. The SNB Annual Report 2020 states that the SNB foreign exchange interventions were in the order of CHF 67.1 billion, increasing SNB sight deposits by 16.7% in 2016. Despite the slightly 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 data[7] are based on the cross-border capital linkages surveys conducted by the Swiss National Bank (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

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

[7]Our data are in fact at the group-level, i.e., all cross-border positions of all entities resident in Switzerland within the group are consolidated.

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

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 either as stocks at the end of the quarter or flows during that quarter, but not both, depending on investment type. In the case of quarterly flows data, they are used directly in our analysis (after the 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 a 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 on portfolio investment is rather small compared to the remaining categories because firms do not report their foreign assets held in a bank custody account and they do not know the identity or residency of the holders of the stocks or bonds that are traded in financial markets.[12]

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

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

[11]The supplementary document explains the details on how we estimate valuation changes and hence capital flows from stocks data.

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

The data on stocks and flows have currency and country breakdown. The currency denomination can be one of the following: US dollar (USD), euro (EUR), British pound (GBP), Swiss franc (CHF), Japanese yen (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. Also 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 data set 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 motivated by limiting the potential zero-observation bias discussed in Baldwin and Harrigan (2011).

Firm-level information of number employees (i.e., our measure of firm size) and residency of the ultimate controlling institution (Swiss, British, or other) are used in the regression analysis as controls. These information also come 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,

[13]The buildup of cash and derivatives positions ahead of the Brexit vote would have provided valuable information as to how firms perceived the Brexit vote.

[14]See Appendix A for the list of 57 countries. The very low ratio of number of observations of non-zero to total observations (i.e., in the order of 1%) indicates that even with our sample of 57 countries the number of zero observations is large. In the supplementary document, we show that our results are robust to using a data set that includes only 25 countries.

there are considerably more non banks and non finance (Non-B & Non-F) companies (362) compared to banks and finance (B & F) companies (79). Second, our sample of companies has financial linkages not only with the UK, but also with other countries denominated in GBP. The number of observed non-zero flows to and from the UK is roughly half the number of non-zero flows that are 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 compared to afterwards. The opposite is, however, observed for the Non-B & Non-F companies. And fifth, the variance of capital in- and outflows is considerably higher for the post-Brexit-vote period. The latter two observations concerning the B & F companies are consistent with the Carney warning 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, while this share increases to almost 62 percent at the end of our sample period. Also 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 liabilities[15].

[Table 2 Summary statistics on UK exposure here]

Tables 3 and 4 provide a further breakdown by resident nationality and firm size of our sample. Note that our sample of companies are dynamic in terms of their nationality. Due to mergers and acquisitions or re-domiciliations of parent companies, the nationality of firms in our sample do change over time. Table 3 shows that a higher fraction of B & F companies are foreign-controlled compared to non-B & non-F companies companies, i.e., about 20 percent 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]

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 non-negligible fraction of our sample. We do keep these firms in our sample and report their results separately in Section 5.

[Table 4 Summary statistics on firm size here]

[15]The supplementary document provides figures summarizing the capital flows data

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, foreign multinational firms often incorporate in 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 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 funds[16] 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 holdings, 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.

[16] Also known as investment funds or collective investment schemes

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 an UK country dummy, which controls for Swiss cross-border flows to and from the UK:

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

where $X_{i,c,t}$ are total, equity, debt or other currency dominated investments for capital in- and outflows, i denotes firms, c denotes 57 countries, and t is time 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 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 conjecture assumes a permanent effect on capital flows, resulting from the new economic environment in leaving the EU.[17] The dummy variable is unity starting 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.

[17]It 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 B. For evidence on the relationship of risk with capital flows, see Forbes and Warnock (2012), with bank lending see Bruno and Shin (2015) and the global financial cycle, see Rey (2015) and Miranda-Agrippino and Rey (2015).

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, $\zeta_t * \alpha_i$, 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 for 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 Carney's conjecture that post-Brexit Britain is vulnerable to operating with a higher risk premium and foreign investment experiences a pullback effect. Next, $\beta \geq 0$ for the same capital outflow suggests that capital outflows from Switzerland to the UK 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 invest-

[18] In a separate document "auxiliary regressions", we show that the empirical results are not dependent on different specifications of fixed effects.

ment 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 empirical results based on equation (1). The first set of findings document the dynamics of capital in- and outflows in our sample of firms as a whole as well as of banks and finance companies and non-banks and non-finance companies separately. Thereafter, findings for capital in- and outflows for different sub-components are discussed. These include regression results that control for firms 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.

[19] As 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 C.

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 Carney's warning in a bilateral setting we take a more granular view in the next subsection.

[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 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. What is important to stress is that the (insignificant) coefficient estimates of all firms is greater for capital outflows than capital inflows. Separate estimates for net flows, presented in Appendix D, confirm this result. The coefficient estimate of the interaction term for net capital flows is statistically insignificant at conventional critical levels.

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 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 falls considerably more in Figure 4 compared to 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 for capital outflows shown in Figure 3.

5.2 The role of firm characteristics

To interpret the behavior of capital in- and outflows in the previous subsection, this subsection examines the role of firm characteristics in cross-border flows. The regressions control for firm nationality (country of control of the firm that is resident in Switzerland), firm size, currency denomination of capital in- and outflows flows, 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 8 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. Rest of the world firms behave similar to UK firms. The difference in coefficient estimates across different firm nationalities suggests that common national ties can be important in explaining the increase in capital outflows observed in Table 7.

The right-hand-side panel of Table 8 presents the capital inflow regressions that control for firm nationality. Each of the coefficient estimates for $Post_t * UK_c$ are small and statistically insignificant, except for the ROW firms. This finding suggests that firm groupings by nationality is 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.

[Table 8 Baseline regression by firm nationality here]

Next, the role of currency denomination is considered. Tables 9 to 12 present regressions that control for currency denomination of capital in- and outflows. The empirical findings for the coefficient of interest are mixed. First, Table 12 shows that the estimates of $Post_t * UK_c$ for capital outflows denominated in USD is about 0.05 and statistically significant for all 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 9 contrasts with the USD denominated capital outflows by Non-B & Non-F firms in Table 12. 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 11 and 10 were muted and statistically insignificant.

[Tables 9 10 11 12 Baseline regression by currency denominations here]

It is well recognized that firms ranked by their size respond differently to aggregate shocks. Di Giovanni et al. (2020), motivated by Gabraix (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 13 presents regressions controlling for firm size. Firm size is measured by number of employees and is classified into three categories: small (less than 50 employees in 2016), medium (more than 50 and less than 250 employees in 2016), and larger (greater than 250 employees in 2016). We group firms without employment information into non-reporting (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 is statistically insignificant. By contrast, Table 13 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 13 firm size here]

Recently Blanchard et al. (2017) has put forth the view that the nature of a country's capital inflows impact 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 falls and is 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 14 and 15 present regression evidence for debt and equity flows separately. The coefficient estimates suggest that debt flows through Non-B & Non-F firms was the primary channel for capital in- and outflows after Brexit. The coefficient estimates for debt in- and outflows for Non-B & Non-F firms is positive and statistically significant. For equity flows the evidence is inconclusive. This evidence suggests that the debt channel put (offsetting) appreciating pressures on the GBP-CHF exchange rate.

[Tables 14 and 15 here]

Tables 16 and 17 suggest that firms resident in Switzerland increased their foreign investment in the UK particularly via short-term debt instruments.

[Tables 16 and 17 here]

6 Conclusions

The empirical findings at the firm level suggest that the Brexit shock did not permanently disrupt cross-border flows between the UK and Switzerland. Three 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 in- and outflows are positively correlated not only in the bilateral context as the UK's current account adjusted, but more importantly the positive correlation appears to hold across a range of sub-groupings 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 back to the UK. Third, the non-uniform 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 masks important compositional differences in firm size and natioality.

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Appendix

A. Sample of destination countries for asset and liability flows

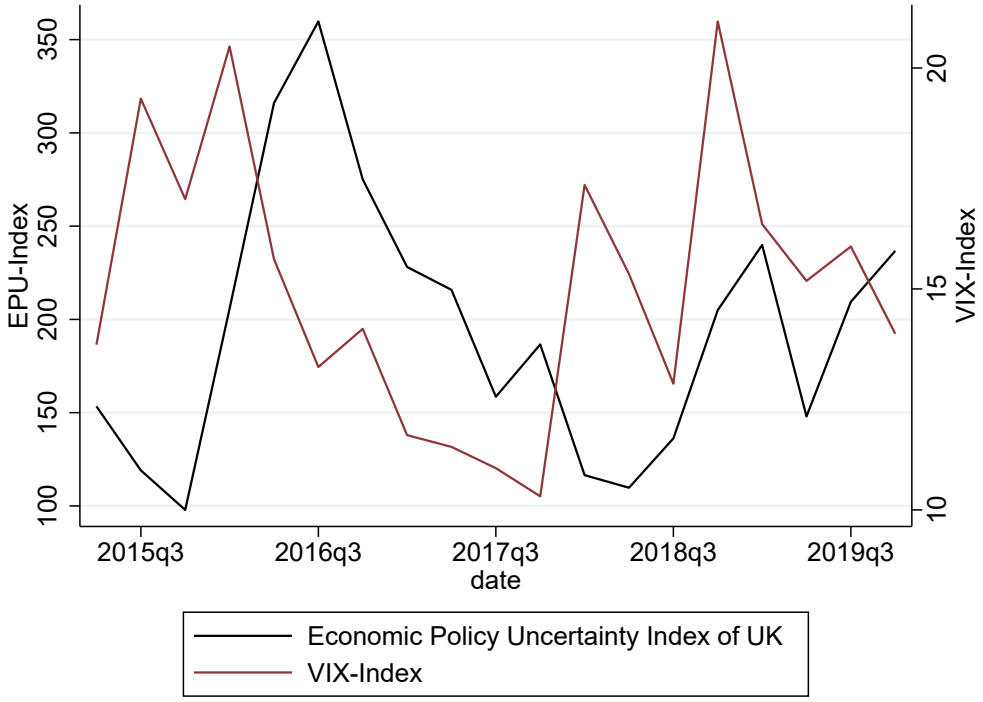
The sample selection of 57 countries is based on the top 50 countries in which our sample of companies have foreign assets and the top 50 countries to which our sample of companies have foreign liabilities to. The merger of these two sets results in 57 countries. This criteria captures almost the entire capital in- and outflows in our sample. 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. Temporary Brexit uncertainty: Plot of UK EPU and VIX

Figure B1 illustrates VIX, the uncertainty series taken from Fred (Federal Reserve Bank of St. Louis), and the economic policy uncertainty index of the UK, taken from Nick Bloom's website EPU. Robustness checks using these two series instead of the interaction term between a Post-Brexit-vote dummy and an UK country dummy can be found in the supplementary document.

Figure B1: Economic Policy Uncertainty Index of the UK versus VIX



C. 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 data set. 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 data set, 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

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

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 0.05 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	0.552*	-0.296	0.016	-0.088	-0.095	-0.330	-0.003	0.152	0.001
	(0.423)	(0.257)	(0.209)	(0.044)	(0.138)	(0.085)	(0.239)	(0.063)	(0.158)	(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	0.069	0.141	-0.063	-0.084	-0.010	-0.112	-0.023	-0.029	-0.081
	(0.232)	(0.117)	(0.110)	(0.077)	(0.118)	(0.156)	(0.123)	(0.066)	(0.059)	(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	0.672*	-0.399*	-0.178	-0.088
	(0.173)	(0.359)	(0.192)	(0.139)	(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	0.132	0.146	0.039	0.002
	(0.304)	(0.138)	(0.117)	(0.090)	(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.

D. Baseline results for net capital flows

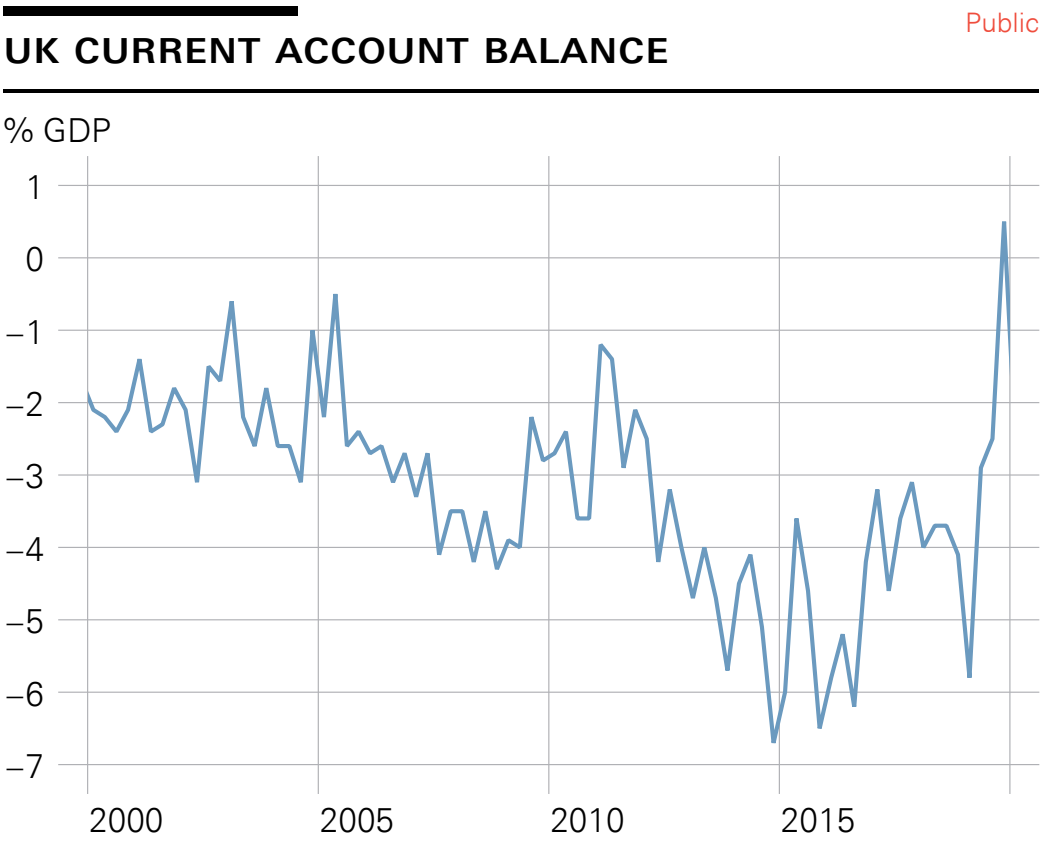
Table C1: Baseline results

	Net Flows		
	(1) All	(2) B & F	(3) Non-B & Non-F
Post x UK	0.018	-0.083	0.041
	(0.046)	(0.085)	(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.

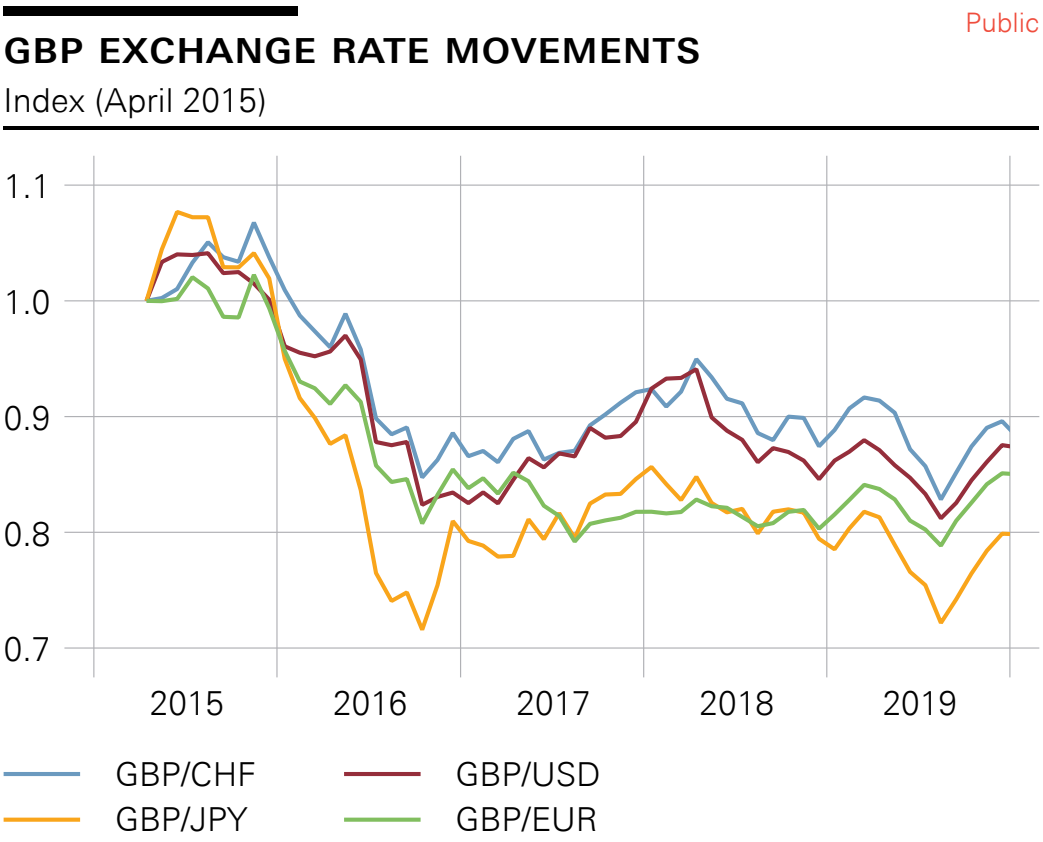
Figures and Tables

Figure 1: UK current account balance



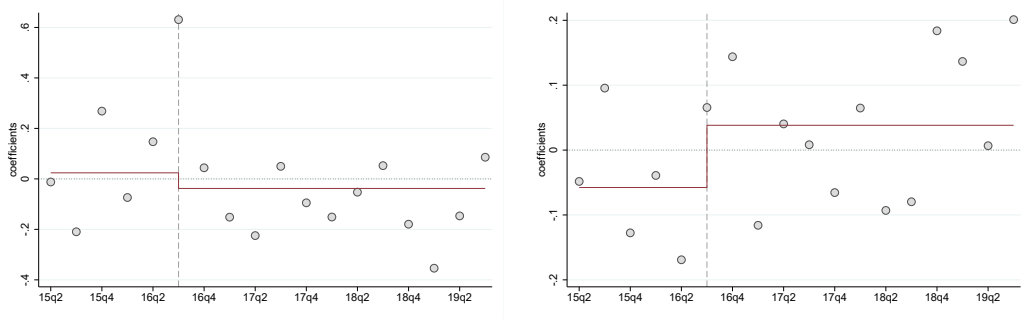
Source: British Office for National Statistics (ONS)

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



Source: British Office for National Statistics (ONS)

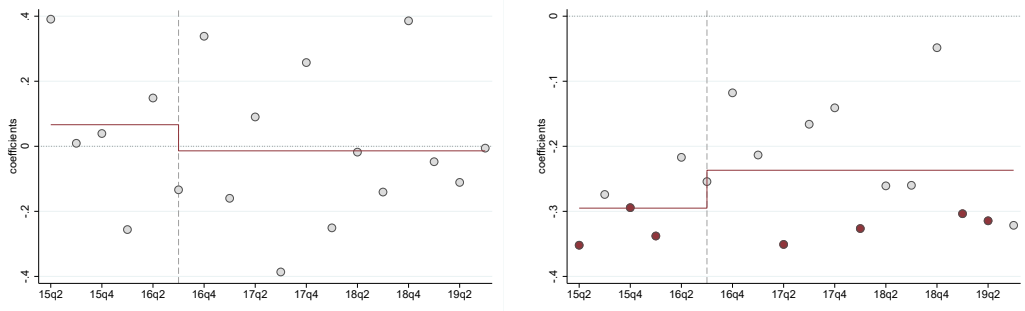
Figure 3: Time-trend Coefficients - Outflows



(a) Banks and Finance Firms (b) Non-Banks and Non-Finance Firms

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

Figure 4: Time-trend Coefficients - Inflows



(a) Banks and Finance Firms (b) Non-Banks and Non-Finance Firms

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 reference quarter prior to the Brexit vote and in 2019Q4 as 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 that are 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: capital flows to and from companies in our sample that have a British-control

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

	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	-0.059	0.093**	0.047	-0.079	0.075*
	(0.041)	(0.097)	(0.046)	(0.039)	(0.091)	(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: Firms 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	0.108	0.045	-0.044	0.239*	-0.031	-0.017	0.024	0.021	0.276*
	(0.179)	(0.107)	(0.070)	(0.057)	(0.130)	(0.206)	(0.091)	(0.063)	(0.062)	(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.

Table 9: 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	-0.173*	0.029	-0.025	-0.150*	0.003
	(0.033)	(0.098)	(0.034)	(0.027)	(0.087)	(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 10: 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	-0.020	-0.004	0.023	0.005	0.027
	(0.012)	(0.034)	(0.013)	(0.017)	(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 11: 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	0.037	0.008	0.006	-0.000	0.007
	(0.021)	(0.044)	(0.024)	(0.015)	(0.024)	(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 12: 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**	0.001	0.056**	0.044	0.024	0.048
	(0.023)	(0.023)	(0.027)	(0.027)	(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 13: 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*	0.095	-0.021	0.126*	-0.062	0.031	0.082	0.046
	(0.106)	(0.132)	(0.065)	(0.068)	(0.085)	(0.070)	(0.063)	(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.

Table 14: 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	-0.046	0.081*	0.005	-0.015	0.009
	(0.039)	(0.091)	(0.044)	(0.016)	(0.034)	(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 15: 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	-0.037	0.080*	-0.006	-0.024	-0.002
	(0.039)	(0.092)	(0.043)	(0.012)	(0.052)	(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 16: 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*	0.039	0.052*	0.002	-0.158	0.037
	(0.027)	(0.054)	(0.030)	(0.038)	(0.110)	(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 17: 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	-0.010	0.037	0.014	-0.051	0.028
	(0.024)	(0.038)	(0.028)	(0.035)	(0.094)	(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.