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The Impact of Financial Transaction Taxes on Stock Markets: Short-Run Effects, Long-Run Effects, and Reallocation of Trading Activity

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THE IMPACT OF FINANCIAL TRANSACTION TAXES ON STOCK MARKETS: SHORT-RUN EFFECTS, LONG-RUN EFFECTS, AND REALLOCATION OF TRADING ACTIVITY

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We investigate the impact of the French 2012 financial transaction tax on trading activity, volatility, and price efficiency measured by first-order autocorrelation. We extend empirical research by analyzing anticipation and reallocation effects. In addition, we consider measures for long-run volatility and first-order autocorrelation that have not been explored yet. We find robust evidence for anticipation effects before the effective date of the French FTT. Controlling for short-run effects, we only find weak evidence for a long-run reduction of trading activity due to the French FTT. Thus, the main effect of the French FTT on trading activity is short-run. We find stronger reactions of low-liquidity treated stocks as well as a reallocation of trading activity to high-liquidity stocks participating in the Supplemental Liquidity Provider Programme, which is both in line with liquidity clientele effects. Finally, there is some (weak) evidence for a persistent volatility reduction, but we find no significant evidence for an FTT impact on price efficiency measured by first-order autocorrelation.

Keywords: financial transaction tax, market quality, anticipation effect, short-run treatment effect, long-run treatment effect

JEL Codes: G02, G12, H24, M4

I. INTRODUCTION

Due to the financial crisis of 2008–09 and the sovereign debt crisis in Europe, there have been efforts of a group of European Union member states to introduce a financial transaction tax (FTT). France and Italy introduced FTTs in 2012 and 2013 that focus primarily on transactions of large-cap stocks and closely related derivatives (e.g., ADRs). At the same time, interest in the impact of such taxes on market quality and stability has increased (e.g., Hemmelgarn and Nicodème, 2010; Burman et al., 2016; Hemmelgarn et al., 2016). FTT proponents claim that such taxes can generate tax revenue with low tax rates (Shackelford, Shaviro, and Slemrod, 2010) and minor distortion of the financial market and the real economy (Hemmelgarn and Nicodème, 2010). A different argument in favor of FTTs is that such taxes would reduce speculative noise trading and thereby increase the financial market's efficiency and stability (Stiglitz, 1989; Summers and Summers, 1989). Furthermore, one might support FTTs for distributional reasons (Burman et al., 2016). On the contrary, FTT opponents have criticized such a form of taxation as inefficient (e.g., Schwert and Seguin, 1993; Umlauf, 1993; Jones and Seguin, 1997). They argue that FTTs result in substantial adjustments of trading activities. Thus, despite low tax rates, they expect a significant distortion of stock markets that increases volatility and adversely affects price efficiency.

Since there is no theoretical consensus on the impact of an FTT, the empirical analysis of FTT effects on stock markets is essential. A high number of recent empirical papers focus on the introduction of an FTT for French-headquartered stocks on August 1, 2012 (e.g., AMF, 2014; Becchetti, Ferrari, and Trenta, 2014; Meyer, Wagener and Weinhardt, 2015; Coelho, 2016; Gomber, Haferkorn, and Zimmermann, 2016; Colliard and Hoffmann, 2017; Parwada, Rui, and Shen, 2021). While the empirical evidence regarding the impact of the French FTT on liquidity, volatility, and stock prices is not entirely conclusive (Burman et al., 2016), a central finding is a substantial and enduring reduction of trading activity of at least 10 percent.

Colliard and Hoffmann (2017) provide evidence for a considerable heterogeneity of market reactions. Thus, while they do not observe significant long-run reductions in trading volume of highly liquid stocks, they find a 20 percent lower trading activity for the less liquid treated stocks in their sample.

Our contribution to this literature comes in several ways. Previous studies interpret the French FTT as a natural experiment and estimate its impact by difference-in-differences (hereafter DiD) estimation, comparing observations shortly before and after the FTT effective date on August 1, 2012 (e.g., Meyer, Wagener and Weinhardt, 2015; Coelho, 2016). However, such an identification strategy does not account for the early FTT announcement. Since the French National Assembly passed the FTT legislation on March 14, 2012, investors had much time to anticipate the FTT introduction in August. We analyze such anticipation effects[1] and provide evidence that FTT anticipation increased trading volumes of treated stocks closely before the FTT deadline. Our evidence suggests that disregarding anticipation effects might overestimate the long-run treatment effects of the French FTT.

Another critical topic is the stable unit of treatment value assumption (SUTVA), which requires that the control group is not affected by the treatment. SUTVA can be a problem for the empirical analysis of FTTs as the trading activity of taxed securities may migrate to untaxed securities (e.g., Umlauf, 1993). This is especially a problem if the control group is a substitute for the treatment group. For example, Deng, Liu, and Wei (2018) analyze the impact of a Chinese FTT on price volatility and use untaxed cross-listings as the control group. While they argue that migration of trading activity between both markets will not be possible due to binding capital controls, there might still be concern about indirect reallocations of capital

[1] We are not aware of any research interpreting the impact of FTT reforms in a dynamic setting as we do. Colliard and Hoffmann (2017) account for abnormal effects in August 2012 but do not interpret them as short-run treatment effects. They also discuss potential anticipation effects as part of their Online Appendix F but do not find such evidence. Coelho (2016) discusses potential anticipation effects. However, due to the short observation window of three weeks before and after the French FTT's effective date, she is not able to identify anticipation effects or short-run treatment effects empirically.

between them. We use a control group of large-cap stocks traded in London and Frankfurt with large trading volumes to account for that problem. In addition, we analyze potential reallocations of trading activity from treated French stocks to untaxed substitute stocks. Our results suggest that the French FTT significantly increased trading volumes of substitute stocks with low transaction costs. We interpret that as direct evidence for liquidity clientele effects (Amihud and Mendelson, 1986; Chen et al., 2020) of the French FTT that support the findings of Colliard and Hoffmann (2017).

Finally, we focus on the design of the French FTT, which encompasses a considerable number of regulations to avoid or at least mitigate a negative impact on liquidity. The tax is limited to the more liquid large-cap stocks with a market capitalization of more than €1 billion. It exempts important trading activities (e.g., market making, securities financing transactions). As pointed out by PwC (2012), "the objective of the 'market maker exemption' is two-fold: avoiding (i) a cascading effect and (ii) any impact on the market liquidity." Market makers are brokerage houses, investment firms, and other market participants who act as intermediaries to provide liquidity and stability to the market. Market makers are obliged to provide bid and ask quotes within certain bounds and earn their profits from bid and ask spreads. If market makers act on behalf of their clients, their trading and hedging activities are exempt from the tax.

Apart from sovereign credit swaps, the French FTT does not tax derivatives. As documented by Credit Swiss (2012) and Coelho (2016), this provides room for tax avoidance, as taxable transactions can be replaced by contracts for differences (CFDs) or other derivatives. Due to the rules on intraday netting, pure day trading is not taxable, which has two important implications. First, the French FTT provides a rebate for intraday transactions. Second, as intraday transactions remain untaxed, the impact on intraday measures might be small.

In light of these particular features of the FTT, we further analyze long-run measures of liquidity and the efficiency of the pricing mechanism of the stock market. In line with

Colliard and Hoffmann (2017), we find a strong short-run reduction of trading activity in August 2012 followed by a much smaller long-run effect in the following months. This result is also in line with other papers that identify strong market reactions closely after the FTT effective date but interpret these (in our view short-run) effects as persistent reductions in trading volume (e.g., Becchetti, Ferrari and Trenta, 2014; Coelho, 2016).

An important difference compared to previous research is the size of the estimated long-run effect. We only find evidence for a long-run reduction of trading volume for the less liquid treated stocks that do not participate in the SLP program by 10.2 percent to 13.7 percent. In comparison, Colliard and Hoffmann (2017) find a reduction of about 20 percent for the same type of stocks. In our baseline specification, even the long-run effect for the non-SLP stocks is not statistically significant. Similar to Colliard and Hoffmann (2017), we do not find evidence for a significant long-run reduction of trading volumes resulting from the French FTT for treated SLP stocks. About one-quarter of the trading volume of treated stocks falls on the treated non-SLP stocks, which suggests an average reduction of trading activity of all treated stocks by 2.7 to 3.6 percent. This estimate undercuts the official assessment of the long-run impact of the French FTT on trading activity of about 10 percent (AMF, 2014; European Commission, 2014) that already accounts for abnormal short-run effects in August 2012. Our results suggest that large reductions of aggregate trading volume by up to 30 percent found by earlier papers primarily arise by short-run market reactions (e.g., Becchetti, Ferrari, and Trenta, 2014; Meyer, Wagener and Weinhardt, 2015; Coelho, 2016).

Regarding volatility, our findings confirm previous evidence of minor effects of the French FTT on daily volatility measures. However, we find some evidence for a relevant reduction of long-run volatility measures. That holds especially for treated stocks not participating in the SLP program. Finally, by using first-order autocorrelations as long-term measures for the efficiency of the pricing mechanism, we cannot confirm the findings by

Colliard and Hoffmann (2017) of an increase of a daily measure of the first-order autocorrelation. This is not a contradiction, as long-run effects on short-term and long-term measures of the first-order autocorrelation do not have to be equivalent. Nevertheless, we do not find significant evidence for a negative and persistent FTT effect on the efficiency of the pricing mechanism.

For future research, our paper has essential insights. First, by providing evidence on anticipation effects before the FTT effective date, we show that short-run and long-run impacts of FTTs might differ significantly. This implies that considering the dynamic structure is critical in research on tax reforms or other events. Ignoring such short-run effects might induce measurement errors in the analyses of long-run impacts.

Second, our results suggest that the French FTT might be less harmful to the stock market than other papers indicate. The reason is that the short-run market reactions seem to be much stronger than the long-run market reactions, which most papers do not account for (e.g., Becchetti, Ferrari and Trenta, 2014; Meyer, Wagener, and Weinhardt, 2015; Capelle-Blancard and Harvylchyk, 2016; Coelho, 2016; Gomber, Haferkorn, and Zimmermann, 2016). We also do not find evidence of adverse long-run effects on volatility or price efficiency. However, in line with Colliard and Hoffmann (2017), our findings point to relevant costs of FTTs, namely more negative consequences for low-liquidity stocks (non-SLP stocks) and positive volume externalities for high-liquidity stocks (substitute stocks participating in the SLP program).

Third, augmenting Colliard and Hoffmann (2017), we find more potent substitution effects for (untreated) substitute SLP stocks than for substitute non-SLP stocks. Thereby, we provides evidence for liquidity clientele effects as the reason for the observed heterogeneity in FTT effects on trading activity (Amihud and Mendelson, 1986; Chen et al., 2020).

Finally, our evidence implies that FTT design is important for the stock market impact of such a tax (Dávila, 2020; Huber et al., 2017). Our findings suggest that a moderate FTT with

low tax rates, a high number of exemptions (e.g., for day trading), tax avoidance opportunities (e.g., by the use of derivatives), a restriction to the most liquid stocks, and modest revenues (€697 million to €964 million from 2013–2017) should not do much harm to the functioning of NYSE Euronext. This underlines the argument of Burman et al. (2016) that the potential benefits and risks of financial transaction taxes should not be overstated. However, that does not mean that other FTT designs in different constellations cannot be an obstacle to the functioning of financial markets. Note that the political targets of FTTs may differ. For example, it might be regarded a target to tax speculative intraday transactions that are regarded as harmful to the market. In addition, restricting tax avoidance opportunities might be considered helpful for distributional reasons. Therefore, political target should have considered in the optimal design of an FTT (Dávila, 2020; Huber et al., 2017).

II. THE 2012 FRENCH FTT

On January 29, 2012, the media informed the French public that President Sarkozy was planning the introduction of an FTT. As announced on February 6, 2012, the FTT with an intended rate of 0.1 percent should only apply to the transactions of stocks of French-headquartered companies with a market capitalization of more than €1 billion on January 1, 2012. Thus, only the shares of the most liquid French stocks should be taxed. The reform further included a tax on high-frequency trading and a tax on the transactions of sovereign credit swaps (both with a much lower rate of 0.01 percent). These additional FTTs generated almost no tax revenue and should only have a marginal impact on the French stock market.[2]

[2] The tax on sovereign debt swaps is restricted to a special type of derivative contract: Thus, the scope of this tax is very limited and the use of alternative derivative contracts provides avoidance opportunities. The high-frequency trading tax was only relevant for high frequency traders (HFTs) if 1) the headquarter of the trader is in France and 2) the ratio of orders subsequently modified or cancelled in one day exceeds 80%. Hence, this tax could be easily avoided, which resulted in a zero tax revenue (Haferkorn and Zimmermann, 2013; Colliard and Hoffmann, 2017). As a consequence, the HFT tax can be rather regarded as a regulation how HFT trading should be organized than as an effective tax on HFTs. Colliard and Hoffmann (2017, Online Appendix C) do not find any evidence that the HFT tax affected trading activity.

The first reading of Tax Bill No. 2012-354 was on February 16. The French National Assembly finally passed the bill on March 14. Therefore, since the middle of March 2012, the introduction of a tax on French large-cap stocks on August 1 was foreseeable. Market efficiency suggests anticipation of that event. Following the presidential and parliamentary elections in May and June, the new President Hollande announced an increase of the FTT rate on stock transactions from 0.1 percent to 0.2 percent on June 26. The National Assembly agreed to double the FTT rate on July 31, one day before the FTT effective date. While investment service providers (e.g., banks) are liable for the tax payment, the tax burden shall be on investors. The final guidelines of the FTT were released on August 2, 2012.

The French FTT has several characteristics that should prevent a decline in liquidity and a migration of transactions to other markets (PwC, 2012; Haferkorn and Zimmermann, 2013) and are essential for understanding FTT impact. The tax applies to the acquisition of securities that provide access to capital and voting rights in the issuing company. Since December 2012, cross-listings, European depositary receipts (EDRs), and American depositary receipts (ADRs) are also taxable. Thus, a simple migration of stock trading to other markets was only a potential strategy to avoid FTT payments in the first four months after the effective date and was probably less attractive than other avoidance opportunities.[3] Small-cap stocks were not directly affected since the French FTT was limited to stocks with a minimum market capitalization of more than €1 billion.

A taxable transaction requires a change in the ownership of a security between two trading days. Pure day trading (intraday netting) is therefore not taxable. While this might mitigate the impact of the French FTT on liquidity provision and trading volume, it also provides a simple way of avoiding FTT payments by opening and closing positions on the same trading day. Such

[3] The French FTT provides opportunity to avoid taxes via the use of derivative contracts (Credit Suisse, 2012). As migration strategies can be pretty costly (e.g., higher trading costs and lower liquidity of ADRs), we assume that migration was likewise not an optimal avoidance strategy.

a form of tax avoidance will only be relevant for investors with relatively short investment horizons.[4] Indeed, the French FTT provides an effective rebate for day trading of 20 bps. The bill further included several tax exemptions to avoid cascading effects and ensure liquidity provision: (1) primary market transactions (e.g., mergers, IPOs); (2) intragroup transactions, restructuring transactions, and employee saving schemes; (3) market-making, clearinghouses, and similar special trading activities relevant for liquidity provision (central securities depositories); (4) transactions performed under liquidity agreements; (5) convertible bonds before conversion (with the conversion us such being a taxable transaction); (6) temporary transfers of securities. The exemption for market makers only applies to transactions where the aim is to satisfy clients' needs.[5] As documented by Bellia et al. (2019) with data from NYSE Euronext, about 70 percent of new orders (including canceled orders) are submitted by market makers. Excluding canceled orders, market makers still account for about 42 percent of new orders.

These exemptions highlight the strong commitment of the French legislature to protect liquidity provision. Besides, the extensive list of tax exemptions leaves room for tax avoidance strategies. For example, the temporary transfer of securities provides a broad scope for tax avoidance (e.g., CFDs, spread betting). Apart from credit default swaps on sovereign debt, derivatives are not taxable for the French FTT. Since derivatives can be used as substitutes for stocks for short-term speculation, this again highlights tax avoidance opportunities for trading strategies with shorter investment horizons.

[4] Investors with long-term investment horizons (e,g., buy-and-hold investors) will not become high-frequency traders because of the FTT. However, while the economic burden of an FTT is low for long-term investors, a tax exemption for day trading provides incentives for short-term investors to reduce holding periods from severeal days to 24 hours to save FTT payments. Atkins and Dyl (1997) provide evidence for a large heterogeneity in holding periods of investors. Çetin (2020) report average holding periods of 23 to 46 days for local investors and 201 to 389 days for foreign investors (day trading). Odean (1999), Barber et al. (2008) and Barber et al. (2014) provide evidence for short-term trading of retail investors. Thus, there is sufficient evidence for short-term trading activity that might be affected by the French tax exemption for day trading.

[5] According to PwC (2012) this includes "a) simulaneously quoting of […] competitive bid and ask prices of comparable size with the result of ensuring market liquidity on a regular and continuous basis", and b) "in the context of its normal activity, executing the orders given by clients or in response to client buy and sell requests."

The French government initially expected to raise €1.5 billion in tax revenue per year. Based on OECD data, the realized tax revenue amounts to €697 million to €964 million from 2013 to 2017 (about 46 percent to 64 percent of the expected revenue). Considering our weak evidence on the impact of the French FTT on trading activity (see Section V.A), this shortfall of revenue should be mainly driven by tax exemptions (e.g., for day trading, market-making) and tax avoidance opportunities (e.g., the use of CFDs or day trading). A trading strategy paper of Credit Suisse (2012) already claims that CFDs and spread betting are common ways to avoid the UK stamp duty and should also be working for the French FTT. Therefore, Credit Suisse (2012) expected an increase in the use of derivatives resulting from the French FTT.

III. THEORY AND HYPOTHESES

Since the French FTT was announced several months before its introduction on August 1, 2012, investors had significant time to react to the reform before the effective date. We consider March 14, when the French National Assembly passed the legislation in the second reading as the official announcement date, and interpret the period between March 14 and July 31 as the FTT anticipation period. Since that date, the French FTT was a foreseeable event that market participants should have anticipated.[6]

We expect that the anticipation of the French FTT increased trading activity before the introduction deadline for three reasons. First, Colliard and Hoffmann (2017) provide evidence for tax clientele effects resulting from the French FTT 2012. They can show that institutional investors adjusted their portfolios so that investors with high trading frequencies reduced their investments in treated French stocks. As the FTT was especially a burden for

[6] While the French FTT had already been declared by President Sarkozy on January 29, 2012, the detailed regulations were still unspecified at that time. Corresponding regulations are important for our identification strategy (especially with regard to the limitation of the treatment group to stocks with a minimum market capitalization of €1 billion). Thus, we decided to focus on the date the French National Assembly passed the law. Blouin, Raedy, and Shackelford (2002) and Dhaliwal and Li (2016) provide evidence that shareholders' tax incentives affect the timing of stock trades.

investors with high trading frequencies, market efficiency suggests that they already used the anticipation period after March 14, 2012, to adjust their portfolios.

Second, as the FTT increased transaction costs, it incentivized to antedate transactions from the period after the announcement date to avoid FTT payments. Such anticipation of trading activity would be consistent with the observation of Colliard and Hoffmann (2017), who find a sizeable short-run reduction of trading volume for treated French stocks in August 2012, but a much weaker long-run impact of the FTT on trading volume.

Third, evidence on media coverage and trading behavior (e.g., Tetlock, 2007; Fang and Peress, 2009) suggests that discussions of the new tax in the French public motivated (noise) traders to increase their trading activity.[7] Concluding, we hypothesize abnormally high trading activity in the FTT anticipation period from March 14, 2012, until July 31, 2012.

H1a. *The anticipation of the French FTT resulted in a temporary increase in trading volumes for treated stocks in the anticipation period before the effective date.*

In line with Colliard and Hoffmann (2017), we expect a robust short-run reduction of trading activity in August 2012 but a weaker long-run effect of the FTT on trading activity. The French FTT provides an incentive for traders with high trading frequency to reduce their shareholdings in taxable stocks (tax clientele effect; Colliard and Hoffman, 2017) and an incentive to minimize trading frequencies (volume effect; Schwert and Seguin, 1993). However, in the particular case of the French FTT, the latter effect is attenuated by an effective tax exemption of day trading. Indeed, the French FTT effectively provides a rebate of 20 bps on intraday trading. In addition, the French FTT provides several additional tax exemptions (e.g., market-making) and alternative ways for tax avoidance (e.g., the use of derivative

[7] The interest of the French public in the FTT can be documented by an analysis of Google trends. If we search the French Google trends for "Taxe sur les transactions financières", we see a lot of interest before the implementation date on August 1, 2012, especially in July 2012 (https://trends.google.fr/trends/explore?date=2012-01-01%202012-12-31&geo=FR&q=taxe%20sur%20les%20transactions%20financi%C3%A8res).

contracts). Overall, these institutional details of the French FTT suggest a relatively weak long-run impact on trading activity.

Colliard and Hoffmann (2017) find a weaker response to the French FTT reform for trading volumes of stocks participating in the NYSE SLP program. NYSE Euronext launched the SLP program on April 1, 2011, to enhance liquidity provision for blue-chip stocks (e.g., NYSE Euronext, 2012; Bellia et al., 2019). The program incentivizes supplemental liquidity providers (i.e., market makers) with a financial rebate when they post liquidity that executes against incoming orders (i.e., passive trades). In 2012, supplemental liquidity providers paid fees of only 30 bps for their trades. They received a rebate of 20 bps for passive trades (NYSE Euronext, 2012). To get these benefits, market makers had to apply for the program. They had to guarantee a minimum of market marking activity (i.e., liquidity provision) for a "basket" of blue-chip stocks participating in the program. Thus, the program's target was to incentivize and regulate market-making, increase liquidity, and reduce transaction costs.

Amihud and Mendelson (1986) predict and provide evidence for a liquidity clientele effect whereby investors with short holding periods select assets with low trading costs. If investors with high trading frequencies adjust their portfolios due to a shock in trading costs, the liquidity clientele effect suggests that they will reduce stockholdings with high trading costs and increase stockholdings with low trading costs (Colliard and Hoffmann, 2017; Chen et al., 2020). This provides a theoretical argument why the French FTT has a more substantial effect on trading volumes of less liquid stocks that did not participate in the SLP program.

H1b. *The introduction of the French FTT on August 1, 2012, resulted in a (moderate) long-run reduction of trading volumes for treated stocks and especially treated stocks that did not participate in the SLP program (non-SLP stocks).*

Regarding the FTT impact on volatility, the literature considers two opposing effects. As argued by Stiglitz (1989) and Summers and Summers (1989), an FTT reduces the incentive

for destabilizing short-term speculation based on investors' beliefs instead of fundamentals (noise trading). This change in the composition between noise traders and fundamental traders reduces volatility (composition effect). However, Schwert and Seguin (1993) also describe an alternative argument that risk-seeking noise traders might be an important counterparty for hedging strategies and thus provide valuable liquidity to the market. In addition, FTTs may also affect fundamental traders. If an FTT drives out noise traders and fundamental traders, it becomes harder to find a counterparty for risky transactions, which decreases liquidity and increases volatility (liquidity effect; e.g., Hau, 2006).

Hence, the impact of an FTT on volatility depends on the relative strength of both effects. If the composition effect dominates the liquidity effect, an FTT will reduce volatility and vice versa (Song and Zhang, 2005; Deng, Liu, and Wei, 2018). As discussed in Section II, the French FTT incorporates many characteristics to avoid distortion of liquidity and the pricing mechanism. In line with that argument, there is only weak empirical evidence for an adverse effect of the French FTT on liquidity measures like bid-ask spread and quoted depth (e.g., Gomber, Haferkorn, and Zimmermann, 2016; Colliard and Hoffmann, 2017). However, previous research on the French FTT relies exclusively on intraday measures of volatility (e.g., Capelle-Blancard and Havrylchyk, 2016; Becchetti, Ferrari, and Trenta, 2014). Since the French FTT does not tax pure day trading, it seems questionable if such a measure is appropriate to identify the impact of the French FTT on volatility as the tax will not directly burden intraday trading. Therefore, we test if the French FTT affects intraday and long-term volatility (*Weekly and Monthly volatility*, see also Online Appendix D). As there are theoretical arguments for an abnormal increase or decrease in volatility, we do not have an explicit expectation regarding the direction of the FTT effect.

H2a. *The introduction of the French FTT abnormally affected the (long-term) volatility of treated stocks.*

Colliard and Hoffmann (2017) also address whether the French FTT affected the efficiency of the pricing mechanism measured by first-order autocorrelation (FOAC). Note that this concept is not a measure for overall economic efficiency. It simply relates to the informational efficiency of price formation at financial markets.[8] Their analysis uses a daily measure of FOAC and finds some (but only weakly statistically significant) evidence for an increase in the ability of past daily returns to predict future daily returns (first-order autocorrelation).

Again, one might argue that a longer-term measure of FOAC could be more appropriate as the French FTT does not tax day trading. Therefore, we also test if we can find evidence for abnormal reactions of long-term measures of FOAC. Due to data limitations, we cannot calculate a daily FOAC measure and therefore restrict our analysis to weekly and (in a robustness check) monthly FOAC.

H2b. *The introduction of the French FTT abnormally affected the long-term first-order autocorrelation (FOAC) of taxable stocks.*

Colliard and Hoffmann (2017) also provide evidence that traders with high trading frequencies adjusted their portfolios and reduced their shareholdings in stocks taxed by the French FTT (clientele effect). These portfolio adjustments suggest an increase in trading activity in substitute stocks used to replace the shareholdings of taxable stocks (reallocation of trading activity) as an externality of the French FTT. Considering the portfolio theory as well as liquidity clientele effects (Amihud and Mendelson, 1986), we expect that such substitute stocks should meet the following requirements: a) similar stock characteristics; b) similar characteristics of the trading environment; and c) low transaction costs.

[8] Efficiency of the pricing mechanism means that all available information is considered efficiently in price formation. As a consequence, there should be no delay in price formation and current changes in prices will not be able to predict future changes in prices. Therefore, a higher FOAC means a lower efficiency of the pricing mechanism (see also Lim and Brooks, 2011).

To test this theoretical consideration, we consider the existing research of Colliard and Hoffmann (2017) again. The authors argue that non-treated French and non-French stocks traded at NYSE Euronext form a natural control group for treated French stocks, as the microstructural environment, including trading protocol, the tick size regime, and the fee structure of this group is most similar to the group of treated stocks. In detail, they rely on 32 Dutch and Luxembourgian stocks with a market capitalization of at least €1 billion and 30 French and 17 Dutch and Luxembourgian stocks with a market capitalization below that threshold as the control group. All these stocks are traded at the Universal Trading Platform (UTP) of NYSE Euronext. This group forms an appropriate sample of substitute stocks that meet well our three characteristics: a) the stocks are similar to the treated stocks in observable characteristics and trends; b) they are traded at the same trading platform with the same microstructural environment; and c) a subgroup of these stocks participates in the SLP program suggesting low transaction costs and also a higher degree of similarity to the treated SLP stocks.

For our empirical analysis, especially the heterogeneity in SLP participation seems to be an essential characteristic. The program is one of the main instruments of NYSE Euronext to incentivize and to regulate market-making activities (Bellia et al., 2019). Colliard and Hoffmann (2017, Online Appendix F), Bellia et al. (2019), and Anagnostidis and Fontaine (2020) provide empirical evidence that the SLP program, as well as market-making regulations in general, have an impact on the liquidity of stocks. Bellia et al. (2019) analyze an adjustment of the program in 2013 and find that while small changes in the program incentives did not significantly impact liquidity, especially the competitive environment of designated market makers seems to be relevant for liquidity provision. Colliard and Hoffmann (2017) further provide evidence that SLP participation attenuated the negative impact of the French FTT on trading volumes of treated stocks. All these findings suggest that SLP participation should be relevant for the reallocation of trading activity. In line with the liquidity clientele effect

(Amihud and Mendelson, 1986; Chen et al., 2020), we hypothesize an abnormally strong reallocation effect on substitute stocks participating in the SLP program.

H3. *The announcement and the introduction of the French FTT resulted in a reallocation of trading activity that increased trading volumes of substitute stocks participating in the SLP program (SLP substitute stocks).*

IV. DATA AND IDENTIFICATION STRATEGY

A. Data

The most relevant identification strategy in the literature on FTTs is the interpretation of tax reforms as natural experiments (e.g., Becchetti, Ferrari, and Trenta, 2014; Meyer, Wagener, and Weinhardt, 2015; Coelho, 2016; Capelle-Blancard and Havrylchyk, 2016; Colliard and Hoffmann, 2017). Note that the French FTT refers exclusively to French-based stocks with a minimum market capitalization of €1 billion.

Essential requirements for a DiD strategy are the common trends assumption and the stable unit of treatment assumption (SUTVA). The common trends assumption demands that the underlying trends of trading volumes and other market indicators of the treatment group are very close to that of the control group. As the control group, we select stocks of the two largest Western European trade centers London (LSE) and Frankfurt (CDAX), with a minimum market capitalization of €1 billion on January 1, 2012. These stocks remained unaffected by tax reforms during the observation period and had a common trend to the treated stocks before the FTT announcement (see also Section IV.C). In addition, London is a leading trading place affecting other European markets.

We collect stock market and financial statement information on French (NYSE Euronext Paris), UK (London Stock Exchange), and German (Frankfurt Stock Exchange)

large-cap stocks from Datastream of Thomson Reuters.[9] For our tests of a reallocation of trading volumes to substitute stocks (H3), we follow Colliard and Hoffmann (2017) in collecting a group of Dutch, French, and Luxembourgian stocks. In line with the literature (Gomber, Haferkorn, and Zimmermann, 2016), we rely on data from regulated markets.[10]

Due to the higher number of large-cap stocks traded in London and Frankfurt, the number of potential control stocks (297 stocks) exceeds our sample's number of treated French stocks (105 stocks). Therefore, we use propensity score matching to find a pre-matched selection of most similar stocks to our sample of treated stocks. We use one-to-one matching without replacement with the primary market characteristics of trading volume and volatility as matching characteristics.[11] For our matching, we use weekly average values of both traits during the pre-anticipation period from November 14, 2011, until March 13, 2012. In doing so, we obtain a pre-matched sample of 102 control stocks and 102 treated stocks. To maximize our sample size for subsample analyses, we did not want to throw away available information on treated stocks. Therefore, we also kept information on three treated stocks without an optimal match in our final data set. Robustness checks excluding those three stocks do not alter our findings (see Online Appendix C).

Similar to our study, several other studies use large-cap stocks from the German stock market (Haferkorn and Zimmermann, 2013; Gomber, Haferkorn, and Zimmermann, 2016; Bellia et al., 2019) or the UK stock market (Meyer, Wagener, and Weinhardt, 2015; Parwada,

[9] While information on trading volumes and stock prices is available on a daily basis, financial statement data are available at an annual level. We exclude all observations with missing information on trading volumes and daily liquidity and do not consider observations with a negative book value.

[10] Colliard and Hoffmann (2013) (an early version of Colliard and Hoffmann, 2017) and to some extent Coelho (2016) also consider data from OTC, dark pools, and other non-regulated trading venues and do not find fundamentally different results for these alternative market venues.

[11] In detail, we use the logarithm of trading volume (in 1,000 trades per stock), the relative daily price volatility, and the relative weekly price volatility for matching. We also performed matches including weekly first-order autocorrelation (FOAC). However, matches including weekly FOAC as matching characteristic performed significantly worse in terms of finding an optimal solution (some specifications did not converge), finding a high number of matched stock-pairs and generating matched pairs with common trends. Therefore, we refrained from using first-order autocorrelation as a matching characteristic.

Rui, and Shen, 2021) as a control group for treated French large-cap stocks. In addition, several papers use non-French large-cap stocks traded at NYSE Euronext (Capelle-Blancard and Havrylchyk, 2016; Colliard and Hoffmann, 2017) or French small-cap stocks traded at NYSE Euronext (Becchetti, Ferrari, and Trenta, 2014; Coelho, 2016; Colliard and Hoffmann, 2017; Parwada, Rui, and Shen, 2021) as control groups. Coelho (2016) also uses a sample of U.S. ADRs of French stocks as the control group. In graphical analyses, we find a relatively weak co-movement of the treated French stocks and French small-cap stocks (Online Appendix K). That holds especially for stocks with very small market capitalizations that Becchetti, Ferrari, and Trenta (2014) or Parwada, Rui, and Shen (2021) analyze. This is in line with evidence on a stronger co-movement of prices of large-cap stocks across countries, whereas small-cap stocks are less correlated. Theoretical reasons for this observation are greater recognition and lower investment barriers of large-cap stocks for international investors resulting in globalized pricing and trading (Huang, 2007; Eun, Huang, and Lai, 2008). Graphical analyses and placebo tests (Online Appendix A) suggest a strong co-movement of the observed market characteristics in the treatment group and in our control group of German and UK large-cap stocks, which supports the common trends assumption for our control group.

Another benefit of our control group is that it should be relatively robust against the stable unit of treatment assumption (SUTVA). SUTVA requires that the treatment exclusively affects the treatment group but not the control group. In the case of an FTT, this can be a problem as trading activities may be relocated from treated stocks to other securities or trading facilities (see also H3). Therefore, a reduction of trading activity (e.g., due to liquidity clientele effects as demonstrated by Colliard and Hoffmann, 2017) could increase the trading activity of substitutes of treated French stocks. This is specifically a problem if trading volumes of substitutes are small and the values of substitutes are closely related to treated stocks. Therefore, untaxed American depositary receipts (like in Coelho, 2016), European depositary

receipts, or cross-listings (like in Deng, Liu, and Wei, 2018) seem risky regarding SUTVA. If trading volumes of substitutes compared to the original stocks are small, even limited trading activity reductions could provoke large shocks on substitutes.

While less problematic, there might be similar concerns for other groups of stocks like the substitute stocks in our sample. As documented by the descriptive statistics in Table 1, we consider 105 treated stocks with an average price-adjusted trading volume of €28.2 million per stock and day, 73 substitute stocks with an average price-adjusted trading volume of €16.7 million per stock and day, and 102 control stocks with an average price-adjusted trading volume of €31.3 million per stock and day. Hence, price-adjusted trading volumes of our control stocks should be sufficiently large to be widely unaffected by shocks in the trading activity of French stocks.

In our view, the substitute stocks (with relatively low trading volumes) are more vulnerable to changes in the trading volumes of the treated French stocks. This is especially the case as the substitute stocks are not only similar to the treated stocks in observable characteristics (similar to our control stocks) but are at the same trading platform with the same microstructural environment (e.g., tick size regime, transaction fees). In addition, part of the substitute stocks participate in the SLP program. While microstructural environment and SLP participation might be less relevant for buy and hold investors with long-run investment horizons, their relevance increases for investors with shorter holding periods. Hence, the microstructural environment and SLP participation seem to be most relevant for investors with high transaction costs and high FTT burdens.

Table 1 provides descriptive statistics for our treated stocks, the control stocks, and the substitute stocks. In calculating these descriptive statistics, we consider November 14, 2011, until December 31, 2012. This period includes the pre-anticipation period (November 14, 2011, to March 13, 2012), the anticipation period (March 14, 2012, to July 31, 2012), the short-run

treatment period (August 1, 2012, to August 31, 2012), and the long-run treatment period (September 1, 2012, to December 31, 2012). Altogether, we consider 29,785 observations of 105 treated French stocks, 28,794 observations of 102 German and UK control stocks, and 21,258 observations of 73 Dutch, French and Luxembourgian substitute stocks. Thus, for each observation of a treated French stock, we have 0.97 observations in the control group and about 0.71 observations in the substitute group.

[Table 1 about here]

Compared to the treatment group, trading volumes (i.e., the number of traded shares per day) and price-adjusted trading volumes (i.e., trading volume multiplied with the average daily stock price) are a bit larger in the control group. We also observe smaller trading volumes and price-adjusted trading volumes in the group of substitute stocks, which should in part be due to stocks with a market capitalization below €1 billion. Nevertheless, if we calculate the ratio of the average price-adjusted trading volume to the average market capitalization (as a measure for relative trading activity), we find similar values in all three groups: 0.27 % for the treated stocks, 0.29 % for control stocks, and 0.32 % for substitute stocks.

Average market capitalizations are very similar in the treatment and the control group, but about half of that value in the substitute group. Compared to the treatment group, the average EBITDA is somewhat higher in the control group and smaller in the substitute group. Market-to-book ratios are highest in the control group and smallest in the treatment group.

Price changes (daily returns) are very close to zero for the treated and control stocks. They are larger (45 bps) for the substitute stocks. Volatilities of the control and treatment groups are close to each other but somewhat more extensive in substitute stocks. That holds especially for the long-term volatility measures (relative weekly volatility and relative monthly volatility). We define volatilities generally as a comparative measure of stock prices. We calculate relative daily volatility (*Daily volatility*) as the difference between the daily maximum

and the minimum price divided by the average price on this day. We approximate the average price by the sum of the highest and the lowest price divided by two. As a weekly volatility measure (*Weekly volatility*), we use the standard deviation of the daily average prices over one week divided by the weekly average price of that week. We calculate *Monthly volatility* (see also Online Appendix D) similarly as *Weekly volatility* but over one month. For our regressions, we rescale all volatility measures by 100 to obtain measures in percentages points and regression coefficients that can be more well interpreted.

We calculate our long-term measures of the first-order autocorrelation (FOAC) in the same spirit as Colliard and Hoffmann (2017) for the daily FOAC. For weekly FOAC, we regress for each stock and each week the daily return at day $t+1$ on the daily return in t. *Weekly FOAC* is the absolute value of the (weekly) regression coefficient. For *Monthly FOAC*, we perform the same exercise for stock-month combinations. Both FOAC values are very similar for treated French stocks, control stocks, and substitute stocks. Note that cross-sectional differences in average values (e.g., for trading volumes) are not a problem to our DiD identification strategy, which is based on the common trends assumption and the stable unit of treatment assumption. Our regressions (Section IV.C) further account for such cross-sectional differences by stock fixed effects.

B. Econometric Specification

The selection of a well-suited control group is not sufficient to identify long-run treatment effects in our setting. As mentioned before, we hypothesize that the announcement of the French FTT on March 14, 2012, affected stock trading of the French market before August 1, 2012 (anticipation period). Since corresponding anticipation effects imply an increase in trading volumes (H1a), the common trends assumption will be violated in this case and DiD estimation will overestimate the long-term FTT effect on trading volume. The same

consideration holds for strong short-run market reactions that may result from an antedating of trades from the post-reform period to the pre-reform period (tax-induced bring-forward effect) and are consistent with the findings of Colliard and Hoffmann (2017). Thus, short-run market reactions do not seem to be a good indicator for the long-run impact of the French FTT and can lead to inconsistent estimates.

As a preliminary step, we perform a simple DiD estimation to replicate the result of earlier studies. Similar to the literature, we consider a pre-reform period of two months (June and July 2012) and a long-run treatment period of two months (September and October 2012). In line with Colliard and Hoffmann (2017), we also account for a short-run treatment period of one month (August 2012). Still, we do not account for anticipation effects as hypothesized by H1a. The dependent variable *Trading Volume* is the logarithm of the number of share trades per day (measured in thousand units of traded stocks). In a robustness test (Online Appendix D), we also test price-adjusted trading volume as an alternative measure. The preliminary DiD model for short-run and long-run treatment effects is

$$(1) \qquad Y_{it} = \alpha + \beta_1 \cdot SDiD_{it} + \beta_2 \cdot LDiD_{it} + \beta_3 \cdot STPeriod_t + \beta_4 \cdot LTPeriod_t + \psi_t + \upsilon_i + u_{it}.$$

$STPeriod_t$ is a dummy variable with a value of one for observations of stock i at time t in August 2012 (short-run treatment period). $LTPeriod_t$ is a dummy variable with a value of one for observations of stock i after August 31, 2012 (long-run treatment period). $SDiD_{it}$ and $LDiD_{it}$ are the DiD interaction terms of $STPeriod_t$ and $LTPeriod_t$ with a dummy variable for treated French large-cap stocks subject to the 2012 FTT. Since stock fixed effects υ_i capture all time-invariant stock characteristics, there is no need to account for country dummies or a dummy variable for treated French stocks. To control seasonality, we further include monthly fixed effects for each month of our observation period (for example, December 2011 and December 2012); u_{it} is the error term.

We assume that anticipation effects distort the results coming from Equation (1). Therefore, we re-estimate the model but choose a longer observation horizon and include a dummy variable for the FTT anticipation period. Hence, we consider four periods: (1) a pre-anticipation period of four months (November 14, 2011, to March 13, 2012); (2) the anticipation period (March 14, 2012, to July 31, 2012); (3) the short-run treatment period (August 1, 2012, to August 31, 2012); and (4) a long-run treatment period of four months (September 1, 2012, to December 31, 2012). We use the pre-anticipation period as a reference point and include dummy variables and DiD interaction terms for the three other periods. Thus, we estimate:

$$Y_{it} = \alpha + \beta_1 \cdot ADiD_{it} + \beta_2 \cdot SDiD_{it} + \beta_3 \cdot LDiD_{it} + \beta_4 \cdot APeriod_t + \beta_5 \cdot STPeriod_t + \beta_6 \cdot LTPeriod_t + \psi_t + \upsilon_i + u_{it}. \quad (2)$$

$APeriod_t$, $STPeriod_t$, and $LTPeriod_t$ are dummy variables for the anticipation period (March 14 to July 31, 2012), the short-run treatment period (August 1 to 31, 2012), and the long-run treatment period (since September 1, 2012). $ADiD_{it}$, $SDiD_{it,}$ and $LDiD_{it}$ are the DiD interaction terms of $APeriod_t$, $STPeriod_t$, and $LTPeriod_t$ with a dummy variable for treated stocks and identify the anticipation and treatment effects. As dependent variable Y_{it} we use again *Trading Volume* (the logarithm of 1,000 traded stock units per day and stock).

A problem identifying anticipation effects by Equation (2) could be non-tax shocks on trading volumes within the anticipation period. In spring and summer 2012, there were presidential (April 22 and May 6, 2012) and parliamentary elections (June 10 and June 17, 2012) in France that could have affected the French stock market. In addition, while we regard that as unlikely, there might be a concern that the annual renewal of the SLP program on June

1, 2012, affected trading volumes, volatility, or first-order autocorrelation.[12] H1a suggests that at least some part of the anticipation effect is due to a short-term antedating of trading activity from August 2012 in the anticipation period. We perform additional DiD regressions on short-term anticipation effects to isolate these effects. These regressions identify an unusually high trading activity of treated French stocks in the second half of July 2012 and shallow trading activity of treated French stocks in August 2012. Therefore, we choose an observation period from the beginning of July, with the first half of July as a reference point for the abnormal increase at the end of July, to the end of September (with September again as the reference point for the presumed increase in trading activity after August 2012). We estimate the following regression model:

$$(3) \qquad Y_{it} = \alpha + \beta_1 \cdot ASDiD_{it} + \beta_2 \cdot SDiD_{it} + \beta_3 \cdot ASPeriod_t + \beta_4 \cdot STPeriod_t + \psi_t + \upsilon_i + u_{it}.$$

$ASPeriod_t$ is a dummy variable with a value of one in a period shortly before the FTT's effective date with two specifications: a) the second half of July (about two weeks; July 16 to 31, 2012), b) the last trading week of July (July 24 to 31, 2012). $STPeriod_t$ is a dummy with a value of one for the short-run treatment period in August 2012. $ASDiD_{it}$ and $SDiD_{it}$ are interaction terms of $ASPeriod_t$ and $STPeriod_t$ with a dummy variable for treated French stocks. As overall observation period, we choose either a) an anticipation period of one month, the short-run treatment period, and a treatment period of one month (July to September 2012) or b) an anticipation period of about two weeks, the short-run treatment period, and a treatment period of about two weeks (July 16, 2012, to September 15, 2012).

[12] NYSE Euronext announced the annual renewal of the program on March 26. The effective date of the prolongation was May 31. While Colliard and Hoffmann (2017) find that the renewal of the program increased depth (a specific liquidity component), they do not find significant evidence for the parameters that we analyze in our study. There is also no indication of a relevant change of the program rules in 2012 (NYSE Euronext, 2012; Colliard and Hoffmann, 2017). All that makes a significant impact of the SLP renewal on the analyzed parameters of our paper rather unlikely. In addition, Bellia et al. (2019) analyze the impact of relevant changes in the SLP program in the following year 2013. While their evidence suggests significant effects of the competition between market makers on liquidity, they do not find evidence that small changes in the incentive structure of the program had a relevant effect.

C. Graphical Analyses

We use our daily data to calculate the weekly mean values of the logarithm of trading volumes (in thousands of traded stocks), our volatility measures, and weekly first-order autocorrelation for each stock for the treatment and the control group. A primary target of this analysis is to determine if our data meet the common trends assumption. We also provide a more detailed and formal analysis of common trends in our Online Appendix A. As our focus is on trends and not means, we demean all variables. Accordingly, we analyze whether trends (and not means) differ between the control and treatment groups. Similar to our regressions, we choose the pre-anticipation period as a reference point and normalize each variable (e.g., *Trading volume*) for each stock by its average value over the pre-anticipation period for the same stock.[13] As there might be concern regarding the reference point of our normalization procedure, we also perform a robustness test, where we demean variables by their average over the whole observation period (Online Appendix K). This robustness test confirms our results.

Figure 1 shows graphical evidence for demeaned values of *Trading volume* (the logarithm of thousands of units of traded stocks), *Weekly FOAC* (first-order autocorrelation of daily returns over one week), *Daily Volatility* (the difference of the daily minimum and maximum price divided by the average price) and *Weekly Volatility* (the weekly standard deviation of daily prices divided by the weekly average price) of the treatment group in comparison to the control group.

[Figure 1 about here]

We center the observation period and define the reference point (week 0) as the week when the French FTT was introduced (August 1, 2012). Vertical lines mark the boundaries

[13] As we observe abnormal trading activity between the treatment and the control group from Christmas celebrations (December 24, 2011) to the turn of the year (January 1, 2012), we exclude those trading days from the calculation of the mean. Thus, for normalization, we calculate for each dependent variable the mean from November 14, 2011 to March 13, 2012, but apart from the trading days from December 24, 2011 to January 1, 2012.

between the anticipation period, the short-run treatment period, and the long-run treatment period. The anticipation period ranges from week -20 to week 0 and the short-run treatment period from week 1 to week 4. In the pre-anticipation period, we find a strong co-movement for all variables, which seems most decisive for *Trading Volume* and *Weekly volatility*.

In line with H1a, we observe abnormally high trading volumes of the treated stocks in the anticipation period and abnormally low trading volumes of treated stocks in the short-run treatment period. In the longer perspective (after week 4), we do not observe differences in trading volumes between the treatment and control groups. For *Daily Volatility* and *Weekly Volatility*, the visual evidence indicates an increase in the anticipation period and a decline in the short-run and long-run treatment periods. However, the effects seem to be relatively small. For *Weekly FOAC*, there is no clear graphical evidence.

Figure 2 reports visual evidence for trading volumes of all substitute stocks and the SLP substitute stocks compared to our control stocks. While we find a strong co-movement of trading volumes of both groups in the pre-anticipation period (before March 14, 2012), we observe an abnormal increase in average trading volumes of the SLP substitute stocks within the anticipation period and especially shortly before and after the effective date of the French FTT. Such evidence is consistent with our H3 that a reallocation of trading activities from the French stocks to the SLP substitute stocks increased the trading volumes of these stocks.

[Figure 2 about here]

V. RESULTS

A. Short-run and Long-run Effects on Trading Volume

We present the regression results on trading volume that account and do not account for anticipation effects (regression models (1) and (2), respectively) in Table 2. We execute regressions by OLS and use robust standard errors clustered at the stock level to account for heteroscedasticity and autocorrelation (Petersen, 2009). The coefficients are elasticities and

cannot be interpreted as relative effects on trading activity.[14] We therefore recalculate coefficients of our DiD dummy variables to determine the relative change in trading volume as $\exp\left(\hat{\beta}_i - \frac{1}{2} \cdot Var\left(\hat{\beta}_i\right)\right) - 1$ (Kennedy, 1981).

[Table 2 about here]

First, we estimate Equation (1) for all treated French stocks, French SLP stocks (treated stocks participating in the SLP program), and French non-SLP stocks (treated stocks not participating in the SLP program). To keep our reference point stable, the control group is identical in all specifications (German and UK control stocks). Columns 1 to 3 in Table 2 provide these "simple" models that do not account for anticipation effects. In line with the "official" estimate of the AMF (2014), the European Commission (2014), and also Colliard and Hoffmann (2017), we find an average reduction of trading volume of about 9.7 percent for the treated stocks. This effect is more substantial for non-SLP stocks (10.7 percent compared to 8.4 percent for SLP stocks). The short-run treatment effect is much larger and amounts to 23.4 percent. Our estimate is in line with earlier studies that imply reductions of trading volumes by more than 20 percent but do not distinguish between short-run and long-run effects (e.g., Becchetti, Ferrari, and Trenta, 2014; Meyer, Wagener, and Weinhardt, 2015; Gomber, Haferkorn, and Zimmermann, 2016).

Columns 4 to 6 report our results for "extended" models (Equation 2), accounting for anticipation effects. Thus, we explicitly identify the anticipation effect by *ADiD*. Confirming H1a, we find a positive and significant anticipation effect of 7.0 percent for all treated French stocks and 11.7 percent for the treated SLP stocks. If we control for this anticipation effect and use an observation period from November 2011 to December 2012, we do not find a significant long-run reduction of trading volumes for any group of treated stocks. This finding does not

[14] In regression models with logarithmic dependent variables, coefficients can be interpreted as marginal effects (elasticities). However, as dummy variables can only take absolute values (zero and one), marginal changes of dummy variables are not possible and corresponding elasticity estimates have no meaningful interpretation.

mean that we provide clear evidence for *no* long-run FTT effects on trading volume. Indeed, the negative coefficient for non-SLP stocks amounts to -0.095, suggesting a reduction of trading activity close to 10 percent. However, the effect is not statistically robust. By contrast, the coefficient is even positive for SLP stocks and relatively large (0.0654), which should indicate a *non-negative* effect. We further observe a significant short-run reduction of trading volume of 15.4 percent for the entire sample (24.1 percent for non-SLP stocks), which we calculate by the Kennedy (1981) formula.[15] For SLP stocks, we only find a significant anticipation effect but no other significant effects. Overall, the findings of the "extended" model confirm the expected anticipation effect of H1a. If we control for the anticipation effect, we do not find a statistically significant change in trading activity. Table 2 suggests that previous findings of a considerable reduction in trading volumes by up to 30 percent (e.g., Becchetti, Ferrari, and Trenta, 2014) are mainly driven by short-run market reactions and do not identify persistent effects.

As discussed before, the results of Table 2 might be challenged by the argument that non-tax and France-specific shocks like the French elections in April, May, and June 2012 or the prolongation of the SLP program affected trading activity. Thus, we perform tests as documented by Equation (3) on short-run anticipation effects closely before the FTT effective date on August 1, 2012, to further mute concerns. In these tests, we perform two alternative specifications. First (Table 3, Models 1 to 3), we test a short-run anticipation period of about two weeks (July 16 until July 31, 2012) with a pre-reform period of one month (July 2012), a short-run treatment period of one month (August 2012), and a treatment period of one month (September 2012). Second (Table 3, Models 4 to 6), we test a short-run anticipation period of one trading week (July 24 until July 31, 2012) with a pre-reform period of about two weeks

[15] We use the information from Model 4 and Model 6 of Table 2 and calculate -0.154 as $\exp\left(-0.166 - \frac{1}{2}\cdot 0.051^2\right) - 1$ and -0.241 as $\exp\left(-0.273 - \frac{1}{2}\cdot 0.071^2\right) - 1$.

(July 16 until July 31, 2012), a short-run treatment period of one month (August 2012), and a treatment period of about two weeks (September 1 until September 15, 2012). We document the results in Table 3.

[Table 3 about here]

We find strong support for positive short-run effects in July 2012 and adverse short-run effects in August 2012 on trading volume in all specifications. This result is in line with H1a suggesting a short-run shifting of trading activity from the post-reform period to the pre-reform period to safe FTT payments. Using the Kenney (1981) formula, Models 1 to 3 imply a positive short-run anticipation effect of 13.0 percent to 13.6 percent and a short-run treatment effect of minus 15.3 percent (SLP stocks) to minus 19.9 percent (non-SLP stocks). Models 4 to 6 imply a positive (short-run) anticipation effect of 11.2 percent (SLP stocks) to 25.9 percent (non-SLP stocks) and a negative short-run treatment effect of minus 13.7 percent (SLP stocks) to minus 22.0 percent (non-SLP stocks).

B. Effects on Volatility and First-Order Autocorrelation

Table 4 reports the results of our long-run tests for volatility (*Daily volatility*, *Weekly volatility*) and first-order autocorrelation (*Weekly FOAC*). Note that we rescale (i.e., multiply) the *Daily volatility* and *Weekly volatility* by 100 to obtain measures in percentage points and regression coefficients that can be more well interpreted. In line with Meyer, Wagener, and Weinhardt (2015), Gomber, Haferkorn, and Zimmermann (2016), or Colliard and Hoffmann (2017), we find no evidence for a significant long-run effect on intraday volatility. We only find some evidence for higher volatility and lower FOAC of treated stocks and especially SLP stocks in the anticipation period. Compared to the average of of *Daily volatility* (*FOAC*), the coefficients suggest a temporary increase in volatility by 6.2 percent to 8.9 percent, respectively a decrease in *FOAC* by 11.0 percent to 12.9 percent that implies a higher price efficiency in

that period. A theoretical explanation for this outcome could be abnormal trading activities resulting from anticipation effects (H1a). In addition, we also do not find significant changes in *Weekly volatility*. However, in a robustness check (Online Appendix D), we find evidence for a significant reduction of a monthly volatility measure (*Monthly volatility*) by 10.1 percent for all stocks and 16.4 percent for non-SLP stocks. We also perform several other tests that provide evidence for a significant reduction of long-term volatility measures (see Online Appendix B, Table B2 for an unmatched control group, Online Appendix E Table E2 for the consideration of seasonality effects, and Online Appendix G Table G2 for an extended long-run treatment period). These estimates suggest a reduction of *Weekly volatility* ranging from 7.8 percent to 14.7 percent with more substantial effects for the non-SLP stocks. Thus, while our findings on short-run volatility measures confirm previous evidence,[16] there is also some evidence for reduction of long-run volatility measures.

[Table 4 about here]

In Columns 7 to 9, we report our results for *Weekly FOAC*. While there is some evidence for significantly lower *Weekly FOAC* for SLP stocks in the anticipation and short-run treatment periods suggesting an enhancement in price efficiency, we do not find significant long-run effects on the efficiency of the pricing mechanism. Therefore, we can neither support nor refute the finding of Colliard and Hoffmann (2017) who find a (weakly) significant increase in first-order autocorrelation. However, as they use a short-term measure of first-order autocorrelation based on 5-minute mid-quote return autocorrelations, our findings are not a contradiction to Colliard and Hoffmann (2017).

[16] Nevertheless, Becchetti, Ferrari, and Trenta (2014) find a significant reduction of volatility measured by the daily stock price volatility and the daily high-low price range.

C. Reallocation of Trading Activity

To test H3 hypothesizing a reallocation of trading volumes to substitute stocks, we re-estimate Equations (2) and (3) with the group of substitute stocks (untreated Dutch, French and Luxembourgian stocks traded at NYSE Euronext) as the treatment group and our sample of German and UK stocks as control stocks. As we hypothesize a more vigorous reaction of substitute stocks with low transaction costs, we perform subsample tests for SLP substitute stocks (substitute stocks participating in the SLP program) and non-SLP substitute stocks. We document regression results in Table 5.

[Table 5 about here]

In the first three columns (Models 1 to 3), we re-estimate Equation (2) to identify anticipation, short-run, and long-run treatment effects. For the substitute stocks participating in the SLP program, we find evidence for an abnormal increase in the *Trading volume* of 9.2 percent in the anticipation period, 28.7 percent in the short-run treatment period, and 17.6 percent in the long-run treatment period. By contrast, we do not find any evidence of abnormal changes in the *Trading volume* of the non-SLP substitute stocks.

In Models 4 to 6 of Table 5, we re-estimate Equation (3) to closely identify short-run anticipation and treatment effects before and after the FTT effective date. For these tests, we use an anticipation period of about two weeks from July 16 to July 31, 2012. For the SLP substitute stocks, we find evidence again for significant short-run anticipation effects on trading volume. In contrast, we do not see any significant short-run effects for abnormal changes in trading activity for non-SLP substitute stocks.

Overall, Table 5 provides robust evidence that portfolio adjustments due to the French FTT reform (see Colliard and Hoffmann, 2017) resulted in a large increase in the trading activity of the SLP substitute stocks but not of the non-SLP substitute stocks. Hence and in line

with H3, Table 5 documents a reallocation of trading activity to non-taxed high liquidity stocks with low transaction costs as an externality of the French FTT (liquidity clientele effect).

D. Robustness Tests

We perform further additional tests and analyses to ensure the robustness of our findings. We report most of these robustness tests as part of the online appendix. In the following, we focus on one issue that seems to be most relevant. There might be a concern that events within the anticipation period bias our empirical findings. These include the French presidential elections on April 22 and May 6, 2012, the prolongation of the SLP program on June 1, 2012, and the French parliamentary elections on June 10 and June 17, 2012.

We exclude all observations in the anticipation period until the parliamentary elections on June 17, 2012 from our sample to rule out such concerns. Thus, we exclude all observations from March 14, 2012, until June 17, 2012, and re-estimate all specifications on our baseline regression model (2). First, we re-estimate our models on *Trading volume* (H1a, H1b) from Table 1 and the reallocation of *Trading volume* on substitute stocks in Table 5 and report results in Table 6.

[Table 6 about here]

Compared to our baseline regressions on *Trading Volume* in Table 2, and using the Kennedy (1981) formula again, we find even stronger anticipation effects increasing *Trading Volume* by 14.1 percent (all stocks) and 24.2 percent (SLP stocks). This is in line with the argument that anticipation effects should be primarily relevant in the last weeks of the anticipation period. Our estimates for short-run treatment effects (abnormal reduction of *Trading Volume* of 15.3 percent to 23.9 percent) are close to our baseline regression results. Long-run treatment effects are again not significantly different from zero. We report results for

Daily volatility, *Weekly volatility,* and *Weekly FOAC* in Table 7. Similar to our baseline tests, we do not find evidence of significant long-run effect of the FTT on these variables.

[Table 7 about here]

We present additional tests and robustness checks in our Online Appendix. Apart from evidence on common trends (Online Appendix A), these robustness tests reveal that our results are robust to a) using an unmatched sample as the control group (Online Appendix B), b) an alternative matched control group (Online Appendix B), c) a balanced match considering only treated firms with an optimal match (Online Appendix C), d) alternative variable specifications (price-adjusted trading volume, monthly measures of volatility and price efficiency, Online Appendix D), e) a triple difference approach controlling for seasonality (Online Appendix E), f) a more extended and a shorter long-run treatment period (Online Appendix F and Online Appendix G), and g) a shorter overall observation period that is more similar to the previous literature (e.g., Colliard and Hoffmann, 2017, Online Appendix H). These additional tests provide some differences from our baseline tests. We find several specifications with significant and adverse long-run FTT treatment effects on *Trading volume* of treated non-SLP stocks. That holds for an unmatched control group (Table B1), price-adjusted trading volume (Table D1), consideration of seasonality effects (Table E1), and a shorter observation period (Table H1). These estimates suggest a long-run reduction of trading activity for non-SLP stocks by 10.2 percent to 13.7 percent. We also find some evidence that the French FTT significantly reduced long-run volatility by 7.8 percent to 16.4 percent. That holds for our tests on *Monthly volatility* (Table C2), consideration of seasonality effects (Table E2), and an extended long-run treatment period (Table G2). We also perform additional tests showing that our heterogeneous results for SLP and non-SLP treated stocks and SLP and non-SLP substitute stocks hold in a triple difference specification that tests for significant differences in treatment effects among these groups (Online Appendix I). In additional analyses in a previous version, we also

investigated daily returns and bid-ask spreads. We did not find significant evidence that the French FTT affected those indicators (see also Eichfelder, Lau and Noth, 2017).

VI. CONCLUSION

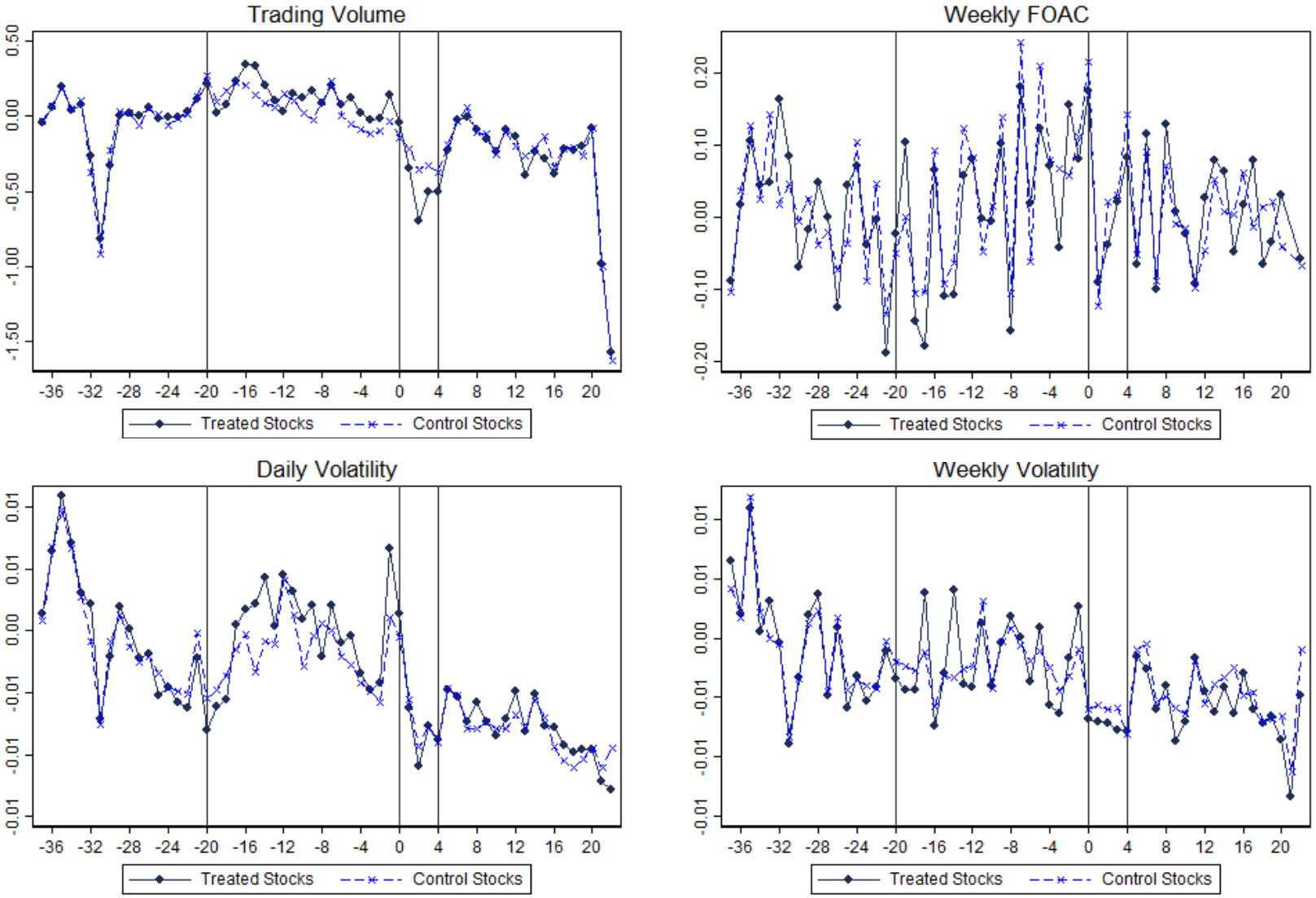
We analyze the impact of the 2012 French FTT on trading volumes, volatility, and price efficiency. We extend empirical research by analyzing anticipation and reallocation effects. In addition, we consider measures for long-run volatility and first-order autocorrelation that have not been explored yet. Controlling for anticipation effects, we only find weak evidence for a long-run reduction of trading activity resulting from the French FTT. Thus, the impact of the tax on trading activity is primarily short-run. However, we find robust evidence for a reallocation of trading activity to high-liquidity stocks participating in the Supplemental Liquidity Provider Programme. We also find some (weak) evidence for a persistent reduction of volatility. In contrast, we do not find consistent evidence for an impact on price efficiency.

If we control for anticipation effects, our evidence (including all robustness tests in the Online Appendix) suggests a long-run reduction of the trading volume of treated SLP stocks by 10.2 percent to 13.7 percent and no adverse effects on treated SLP stocks. As non-SLP stocks are responsible for about 26.5 percent of trading volume (see Online Appendix J), this implies a reduction of aggregate trading of all treated stocks by about 2.7 percent to 3.6 percent. This is clearly below the official estimate of 10 percent (AMF, 2014; European Commission, 2014). Considering long-run volatility measures, we also find evidence for a reduction of 7.8 percent to 16.4 percent resulting from the French FTT reform.

We also would like to mention the limitations of our research. First, like for all other papers using DiD methods, the choice of the reference point might impact the outcome. We argue and provide evidence that our control group and our reference period are well suited for our analysis. However, there is no guarantee that other control groups or reference periods

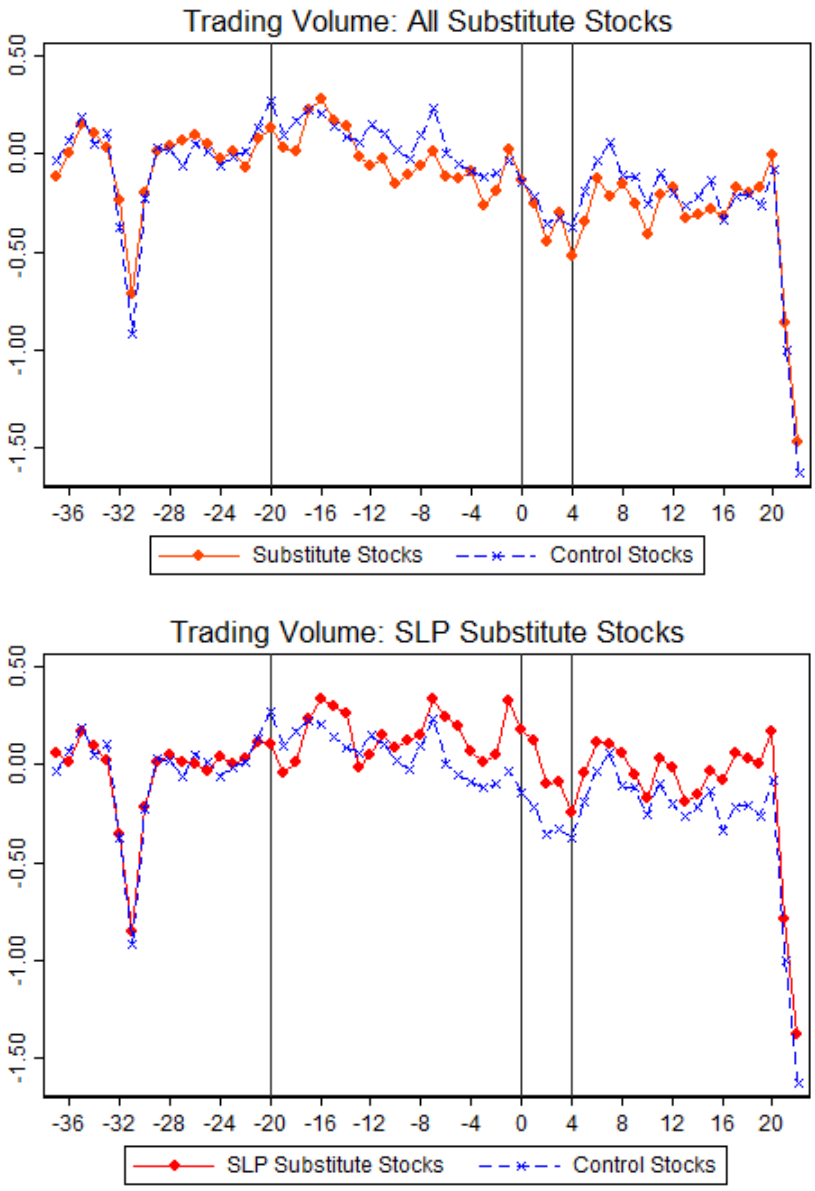
might be even more suitable. For example, one might argue that other events between the pre-anticipation period and the treatment period affected the control and treatment groups differently. This could be an argument to use the anticipation period and not the pre-anticipation period as a point of reference, even if this might induce bias by neglecting anticipation effects. Second, we argue that the French FTT provides significant room for tax avoidance (by day trading, the use of tax exemptions, or the use of derivative contracts). Although we cannot identify tax avoidance practices with our data, we consider it a somewhat overlooked aspect of FTTs that should also matter for FTT design.

Figure 1
UK and German Large-cap Stocks versus French Treated Stock



Notes: This figure provides evidence on normalized parameters for the treatment and the control group. For normalization, we use for each stock and each parameter the average value of the pre-anticipation period apart from the period of Christmas to New Year (November 13, 2011 to December 23, 2011 and January 2, 2012 to March 13, 2012). Week -20 indicates the announcement week (March 14, 2012) and week 0 the introduction week (August 1, 2012). The period between these dates is the anticipation period. The period from week 0 to week 4 is the short-run treatment period and the time span from week 4 onward is the long-run treatment period.

Figure 2
Reallocation of Trading Activity



Notes: This figure provides evidence on normalized parameters for the treatment and the control group. For normalization, we use for each stock and each parameter the average value of the pre-anticipation period apart from the period of Christmas to New Year (November 13, 2011 to December 23, 2011 and January 2, 2012 to March 13, 2012). Week -20 indicates the announcement week (March 14, 2012) and week 0 the introduction week (August 1, 2012). The period between these dates is the anticipation period. The period from week 0 to week 4 is the short-run treatment period and the time span from week 4 onward is the long-run treatment period.

Table 1
Descriptive Statistics

Group	French stocks			Control stocks			Substitute stocks		
Observations	29,785			28,794			21,258		
Stocks	105			102			73		
Variable	Mean	Median	Standard deviation	Mean	Median	Standard deviation	Mean	Median	Standard deviation
Trading volume (1,000 trades)	1,600.80	305.90	4,848.12	3,749.48	593.90	19,184.63	1,489.92	211.75	4,306.77
Share price (€)	53.35	34.90	68.94	29.58	16.49	39.08	22.10	15.97	23.70
Price-adjusted volume (million €)	28.17	8.95	46.98	31.28	7.23	57.50	16.76	2.52	37.04
Market capitalization (million €)	10,339.81	4,423.55	15,584.00	10,775.61	3,354.32	19,133.88	5,269.82	883.15	13,298.62
EBITDA (1000s €)	2,430.00	892.17	4,412.16	3,286.31	538.71	7,924.32	1,462.48	141.77	6,108.32
Market-to-book ratio (%)	154.49	126.00	147.56	348.74	145.00	1,883.93	290.32	130.00	1,749.89
Daily return (%)	0.06	0.00	2.04	0.08	0.06	1.83	0.45	0.00	26.68
Daily volatility (%)	2.54	2.19	1.52	2.26	1.92	1.50	2.98	2.44	2.15
Weekly volatility (%)	1.48	1.18	1.11	1.32	1.07	0.97	1.86	1.39	2.25
Monthly volatility (%)	2.99	2.52	1.92	2.78	2.38	1.76	3.88	3.09	3.28
Weekly first-order autocorrelation (%)	40.01	33.32	36.71	40.12	33.66	33.69	39.81	32.72	37.12
Monthly first-order autocorrelation (%)	18.16	15.47	13.38	18.39	16.39	13.02	19.34	17.50	13.85

Notes: The number of observations is smaller for EBIDTA, relative weekly and monthly volatilities, weekly and monthly first-order autocorrelations as these parameters are not available on a daily basis. Trading volume is the number of trades per share and day in 1,000s. Share price is the average daily share price (the sum of the minimum and maximum price divided by two). Price-adjusted trading volume is the product of share price (in Euro) and trading volume. The volume to market ratio is the ratio of price-adjusted volume to market capitalization. EBITDA is earnings before interests, taxes, depreciations, and amortizations in 1,000 €. The market-to-book ratio is the ratio of market capitalization to book value. Daily return is the change in share price from *t-1* to *t*. Daily volatility is the difference between the maximum and the minimum price divided by the average share price. Weekly volatility is the standard deviation of average daily share prices divided by the weekly average share price over one week. Monthly volatility is the standard deviation of average daily share prices divided by the monthly average share price over one month. For weekly FOAC, we regress for each stock and each week the daily return at day *t+1* on the daily return in *t*. Weekly first-order autocorrelation is the absolute value of the (weekly) regression coefficient. For monthly first-order autocorrelation, we perform the same exercise for stock-month combinations.

Table 2
Trading Volume, Long-run Effects

Model	1	2	3	4	5	6
Anticipation period	No	No	No	Yes	Yes	Yes
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**--**	**--**	**--**	**.068***	**.111*****	**.030**
	--	**--**	**--**	**(.037)**	**(.036)**	**(.050)**
SDiD	**-.266*****	**-.244*****	**-.284*****	**-.166*****	**-.046**	**-.273*****
	(.036)	**(.034)**	**(.052)**	**(.051)**	**(.045)**	**(.071)**
LDiD	**-.101*****	**-.090*****	**-0.112****	**-.021**	**.065**	**-.096**
	(.035)	**(.031)**	**(0.051)**	**(.049)**	**(.046)**	**(.064)**
APeriod	--	--	--	.031	.032	.081***
	--	--	--	(.029)	(.028)	(.030)
STPeriod	-.208***	-.198***	-.206***	-.193***	-.195***	-.118***
	(.023)	(.024)	(.024)	(.036)	(.035)	(.038)
LTPeriod	.003	.010	.012	.029	.028	.098**
	(.027)	(.027)	(.029)	(.041)	(.040)	(.043)
Stock fixed effects	YES	YES	YES	YES	YES	YES
Month fixed effects	YES	YES	YES	YES	YES	YES
Observations	21,948	16,033	16,716	58,579	42,714	44,659
Number of stocks	207	150	159	207	150	159
Adjusted R^2	0.956	0.942	0.956	0.948	0.929	0.949

Notes: The treatment group consists of treated French stocks. The control group comprises matched German and UK large-cap stocks. We perform separate regressions for treated stocks that participate and do not participate in the SLP program. The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy variable with a value of one in the anticipation period from March 14, 2012, until July 31, 2012. *LTPeriod* (*STPeriod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD*, *SDiD*, and *LDiD* are the interaction terms of *APeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks.

Table 3
Trading Volume, Short-run Effects

Model	1	2	3	4	5	6
Reference period	Two weeks	Two weeks	Two weeks	One week	One week	One week
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ASDiD	**.125*** **	**.128*** **	**.123*** **	**.166*** **	**.231*** **	**.108***
	(.035)	**(.037)**	**(.044)**	**(.045)**	**(.042)**	**(.062)**
SDiD	**-.195*** **	**-.166*** **	**-.221*** **	**-.200*** **	**-.147*** **	**-.247*** **
	(.031)	**(.032)**	**(.042)**	**(.034)**	**(.032)**	**(.048)**
ASPeriod	-.006	-.006	-.006	.000	.000	.000
	(.027)	(.027)	(.027)	(.032)	(.032)	(.032)
STPeriod	-.205***	-.205***	-.205***	-.187***	-.187***	-.187***
	(.021)	(.021)	(.021)	(.023)	(.023)	(.023)
Stock fixed effects	YES	YES	YES	YES	YES	YES
Month fixed effects	YES	YES	YES	YES	YES	YES
Observations	13,129	9,610	10,009	9,072	6,643	6,912
Number of stocks	200	346	355	403	346	355
Adjusted R^2	0.956	0.943	0.957	0.956	0.944	0.957

Notes: The treatment group consists of treated French stocks. The control group comprises matched German and UK large-cap stocks. We perform separate regressions for treated stocks that participate and do not participate in the SLP program. The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *ASPeriod* is a dummy variable with a value of one in the short-run anticipation period from July 16 to July 31, 2012 (Models 1 to 3) or from July 24 to July 31, 2012 (Models 4 to 6). *STPeriod* is a dummy variable with a value of one in the short-run treatment period from August 1 to August 31, 2012. *ASDiD* and *SDiD* are interaction terms of *ASPeriod* and *STPeriod* with a dummy variable for treated French stocks.

Table 4
Volatility and First-Order Autocorrelation

Model	1	2	3	4	5	6	7	8	9
Dependent variable	Daily volatility	Daily volatility	Daily volatility	Weekly volatility	Weekly volatility	Weekly volatility	Weekly FOAC	Weekly FOAC	Weekly FOAC
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**.160*** **	**.228*** **	**0.010**	**0.019**	**.070**	**-.024**	**-.024**	**-.044** **	**-.006**
	(.054)	**(.052)**	**(0.076)**	**(0.059)**	**(.061)**	**(0.082)**	**(.016)**	**(.020)**	**(.020)**
SDiD	**-.024**	**.069**	**-0.106**	**-0.105**	**-.056**	**-.148**	**-.028**	**-.052** **	**-.007**
	(.071)	**(.086)**	**(0.092)**	**(0.075)**	**(.092)**	**(.095)**	**(.024)**	**(.024)**	**(.031)**
LDiD	**.049**	**0.110**	**-.004**	**-0.081**	**-.048**	**-.109**	**.005**	**-.008**	**.017**
	(.075)	**(.085)**	**(0.104)**	**(0.061)**	**(.067)**	**(.083)**	**(.016)**	**(.021)**	**(.019)**
APeriod	-.297***	-.272***	-.243***	-0.228***	-.194**	-.210***	.108***	.104***	.073***
	(.052)	(.057)	(.058)	(0.067)	(.076)	(.076)	(.022)	(.026)	(.024)
STPeriod	-.619***	-.594***	-.552***	-0.577***	-.560***	-.550***	.051	.0526	.013
	(.063)	(.071)	(.070)	(0.084)	(.093)	(.095)	(.032)	(.037)	(.035)
LTPeriod	-.602***	-.578***	-.539***	-0.214**	-.203**	-.189*	.019	.029	-.029
	(.067)	(.075)	(.075)	(0.086)	(.095)	(.100)	(.029)	(.035)	(.033)
Stock FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	58,579	42,714	44,659	12,291	8,946	9,411	11,757	8,591	8,925
Number of stocks	207	150	159	207	150	159	207	150	159
Adjusted R^2	0.332	0.327	0.316	0.283	0.287	0.270	0.017	0.014	0.018

Notes: The treatment group consists of treated French stocks. The control group comprises matched German and UK large-cap stocks. We perform separate regressions for treated stocks that participate and do not participate in the SLP program. *Daily volatility* is the difference between the maximum and the minimum price divided by the average share price and multiplied with 100. *Weekly volatility* is the standard deviation of average daily share prices divided by the weekly average share price and multiplied with 100. *Weekly FOAC* is the absolute value of the (weekly) regression coefficient of a regression of the daily return in *t+1* on the daily return in *t*. We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy variable with a value of one in the anticipation period from March 14, 2012, until July 31, 2012. *LTPeriod* (*STPeriod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD*, *SDiD*, and *LDiD* are the interaction terms of *APeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks.

Table 5

Reallocation of Trading Activity

Model	1	2	3	4	5	6
Time window	Long-run	Long-run	Long-run	Short-run	Short-run	Short-run
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**.035**	**.087****	**-.039**	--	--	--
	(.048)	**(.038)**	**(.086)**	--	--	--
ASDiD	--	--	--	**.109****	**.115****	**.099**
	--	--	--	**(.044)**	**(.052)**	**(.061)**
SDiD	**.138***	**.252*****	**-.025**	**.086****	**.112****	**.049**
	(.072)	**(.059)**	**(.133)**	**(.038)**	**(.046)**	**(.054)**
LDiD	**.069**	**.160****	**-.060**	--	--	--
	(.063)	**(.066)**	**(.094)**	--	--	--
APeriod	.069**	.055*	.115***	--	--	--
	(.031)	(.030)	(.031)	--	--	--
ASPeriod	--	--	--	-.006	-.006	-.006
	--	--	--	(.027)	(.027)	(.027)
STPeriod	-.150***	-.164***	-.081**	-.205***	-.205***	-.205***
	(.039)	(.037)	(.040)	(0.021)	(.021)	(.021)
LTPeriod	.064	.052	.133***	--	--	--
	(.044)	(.045)	(.043)	--	--	--
Stock fixed effects	YES	YES	YES	YES	YES	YES
Month fixed effects	YES	YES	YES	YES	YES	YES
Observations	42,145	36,588	34,351	9,457	8,222	7,725
Number of stocks	148	129	121	148	129	121
Adjusted R^2	0.930	0.936	0.927	0.945	0.949	0.942

Notes: The treatment group consists of substitute stocks. The control group comprises matched German and UK large-cap stocks. We perform separate regressions for stocks that participate and do not participate in the SLP program. The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy with a value of one in the anticipation period from March 14, 2012, until July 31, 2012. *ASPeriod* is a dummy with a value of one in the short-run anticipation period from July 16 to July 31, 2012. *LTPeriod* (*STPeriod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD, ASDiD*, *SDiD*, and *LDiD* are the interaction terms of *APeriod*, *ASPeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for substitute stocks.

Table 6
French Elections: Trading Volume

Model	1	2	3	4	5	6
Dependent variable	Trading volume	Trading volume	Trading volume	Trading volume	Trading volume	Trading volume
Treatment group	Treated stocks	Treated stocks	Treated stocks	Substitute stocks	Substitute stocks	Substitute stocks
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**.133*** **	**.218*** **	**.059**	**.110**	**.222*** **	**-.047**
	(.048)	**(.047)**	**(.064)**	**(.072)**	**(.053)**	**(.135)**
SDiD	**-.165*** **	**-.0457**	**-.271*** **	**.140***	**.256*** **	**-.024**
	(.051)	**(.045)**	**(.072)**	**(.072)**	**(.060)**	**(.134)**
LDiD	**-.021**	**.065**	**-.095**	**.071**	**.164** **	**-.060**
	(.049)	**(.046)**	**(.064)**	**(.064)**	**(.067)**	**(.096)**
Stock fixed effects	YES	YES	YES	YES	YES	YES
Month fixed effects	YES	YES	YES	YES	YES	YES
Observations	45,477	33,163	34,677	32,753	28,431	26,685
Number of stocks	207	150	159	148	129	121
Adjusted R^2	0.946	0.926	0.947	0.926	0.933	0.922

Notes: The treatment group consists either of treated French stocks (Models 1 to 3) or substitute stocks (Models 4 to 6). The control group comprises matched German and UK large-cap stocks. We exclude all observations from March 14 to June 17, 2012. We perform separate regressions for treated stocks that participate and do not participate in the SLP program. The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. We only report regression coefficients for *ADiD*, *SDiD*, and *LDiD*, the interaction terms of *APeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks (Models 1 to 3) or substitute stocks (Models 4 to 6).

Table 7
French Elections: Volatility and First-Order Autocorrelation

Model	1	2	3	4	5	6	7	8	9
Dependent variable	Daily Volatility	Daily Volatility	Daily Volatility	Weekly volatility	Weekly volatility	Weekly volatility	Weekly FOAC	Weekly FOAC	Weekly FOAC
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**.195*** **	**.280*** **	**.120**	**.008**	**.093**	**-.064**	**-.014**	**-.047***	**.016**
	(.063)	**(.066)**	**(.086)**	**(.069)**	**(.071)**	**(.097)**	**(.023)**	**(.028)**	**(.029)**
SDiD	**-.022**	**.068**	**-.102**	**-.099**	**-.052**	**-.140**	**-.030**	**-.054** **	**-.008**
	(.071)	**(.086)**	**(.092)**	**(.074)**	**(.091)**	**(.094)**	**(.024)**	**(.024)**	**(.031)**
LDiD	**.050**	**.110**	**-.002**	**-.076**	**-.043**	**-.104**	**.004**	**-.010**	**.017**
	(.075)	**(.085)**	**(.104)**	**(.060)**	**(.066)**	**(.082)**	**(.016)**	**(.021)**	**(.018)**
Stock FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	45,477	33,163	34,677	9,617	6,998	7,361	9,192	6,718	6,984
Number of stocks	207	150	159	207	150	159	207	150	159
Adjusted R^2	0.326	0.328	0.314	0.290	0.298	0.274	0.015	0.010	0.017

Notes: The treatment group consists of treated French stocks. The control group comprises matched German and UK large-cap stocks. We exclude all observations from March 14 to June 17, 2012. *Daily volatility* is the difference between the maximum and the minimum price divided by the average share price and multiplied with 100. *Weekly volatility* is the standard deviation of average daily share prices divided the by weekly average share price and multiplied with 100. *Weekly FOAC* is the absolute value of the (weekly) regression coefficient of a regression of the daily return in *t+1* on the daily return in *t*. We perform separate regressions for treated stocks that participate and do not participate in the SLP program. We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. We only report regression coefficients for *ADiD*, *SDiD*, and *LDiD*, which are the interaction terms of *APeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks.

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CONFLICT OF INTEREST DISCLOSURE

The authors have no financial arrangements that might give rise to conflicts of interest concerning the research reported in this paper.

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ONLINE APPENDIX

Contents

ONLINE APPENDIX A: PLACEBO TESTS ON COMMON TRENDS

As an econometric test for the common trend of our control group and our treatment group before the announcement of the French FTT reform, we perform a weekly difference-in-differences estimation over the pre-anticipation period of four months (November 14, 2011, to March 13, 2012) of the following form:

$$Y_{it} = \alpha + \sum_{w=1}^{W} \beta_w \cdot WEEK_{wt} + \sum_{w=1}^{W} \gamma_w \cdot WEEK \times TREATED_{wit} + \upsilon_i + u_{it}. \quad \text{(A1)}$$

Y is the relevant dependent variable (e.g., *Trading volume*). $WEEK_{wt}$ is a set of *W* dummy variables for all weeks of the four months with a value of one if a trading day *t* falls in the corresponding week *w*. We define $WEEK \times TREATED_{wit}$ as a set of *W* dummy variables with a value of one if a) a trading day *t* falls in the corresponding week *w* and b) the observation *i* belongs to the treatment group. Hence, the dummy variables $WEEK \times TREATED_{wit}$ identify significant differences in the treatment and control group trends on a weekly basis. Similar to our baseline setting, we account for all time-invariant stock characteristics by stock fixed effects υ_i.

We report the coefficients $WEEK \times TREATED_{wit}$ for *Trading volume*, *Daily volatility*, *Weekly volatility,* and *Weekly FOAC* as dependent variables in Table A1. For brevity, we do not report coefficients for the $WEEK_w$ dummy variables. For *Trading volume*, *Daily volatility*, and *Weekly FOAC*, we do not find any evidence for differences in trends. Hence, while there are a few weeks with significant differences between the treatment and control groups,[1] there are no such differences over several weeks. This suggests a common trend that might be affected by exogenous shocks that revert to the mean.

[1] For *Trading volume*, we find a positive and (weakly) significant difference for week 5 and a negative and (weakly) significant difference for week 7. For *Daily volatility*, we find a positive and significant difference for week 5 and a negative and significant difference for week 12 and week 16. For *Weekly volatility*, we find a positive and (weakly) significant difference for week 3 and a negative and significant difference for week 12 and week 16.

An exception is *Weekly volatility*, where we observe several negative and (weakly) significant coefficients after week 11 (January 31, 2012, to February 3, 2012). Thus, there might have been a significant reduction of *Weekly volatility* after the end of January 2012 for the treatment group compared to the control group. This could raise concerns about the common trends assumption if we use *Weekly volatility* as a dependent variable.

Table A1

Weekly Placebo Tests on Common Trends: Baseline control group

Model	(1)	(2)	(3)	(3)
Variables	Trading volume	Daily volatiilty	Weekly volatility	Weekly FOAC
WEEK 1 × Treated	-0.0133	-0.000911	-0.00208	-0.0339
	(0.0416)	(0.00155)	(0.00225)	(0.0573)
WEEK 2 × Treated	0.0166	0.000681	-0.00343	-0.0311
	(0.0473)	(0.00135)	(0.00211)	(0.0569)
WEEK 3 × Treated	-0.00553	-0.000101	-0.00385*	0.00390
	(0.0475)	(0.00160)	(0.00215)	(0.0686)
WEEK 4 × Treated	-0.0237	-0.000197	0.000659	-0.103**
	(0.0538)	(0.00125)	(0.00197)	(0.0471)
WEEK 5 × Treated	0.110*	0.00240**	-0.00235	0.132
	(0.0583)	(0.00117)	(0.00188)	(0.107)
WEEK 6 × Treated	0.103	-0.000213	-0.00303	0.0207
	(0.0656)	(0.00133)	(0.00191)	(0.109)
WEEK 7 × Treated	-0.101*	-0.00189	-0.00204	-0.0747
	(0.0553)	(0.00117)	(0.00182)	(0.0498)
WEEK 8 × Treated	-0.0240	0.000128	-0.00161	-0.0565
	(0.0648)	(0.00144)	(0.00210)	(0.0562)
WEEK 9 × Treated	0.00543	0.000690	-0.00124	0.0702
	(0.0655)	(0.00140)	(0.00212)	(0.0543)
WEEK 10 × Treated	0.0704	-0.000275	-0.00274	0.00903
	(0.0637)	(0.00125)	(0.00200)	(0.0547)
WEEK 11 × Treated	0.0131	-0.000410	-0.00322*	-0.0661
	(0.0631)	(0.00138)	(0.00184)	(0.0480)
WEEK 12 × Treated	-0.0161	-0.00235*	-0.00388*	0.0638
	(0.0678)	(0.00131)	(0.00222)	(0.0567)
WEEK 13 × Treated	0.0520	-0.000366	-0.00197	-0.0448
	(0.0708)	(0.00132)	(0.00193)	(0.0633)
WEEK 14 × Treated	0.0147	-0.00150	-0.00370*	0.0375
	(0.0696)	(0.00118)	(0.00188)	(0.0552)
WEEK 15 × Treated	0.0141	-0.00171	-0.00228	-0.0676
	(0.0739)	(0.00138)	(0.00235)	(0.0609)
WEEK 16 × Treated	-0.0215	-0.00255**	-0.00314*	-0.0675
	(0.0675)	(0.00121)	(0.00176)	(0.0450)
WEEK 17 × Treated	0.0226	-0.00123	-0.00370*	0.0139
	(0.0730)	(0.00156)	(0.00210)	(0.0499)
Stock FE	YES	YES	YES	YES
Week FE	YES	YES	YES	YES
Observations	17,399	17,399	3,714	3,581
Adjusted R^2	0.956	0.372	0.400	0.0377

Notes: The treatment group consists of treated French stocks, and the control group comprises matched German and UK large-cap stocks. *Trading volume* is the logarithm of the number of traded shares (in thousands). *Daily volatility* is the difference between the maximum and the minimum price divided by the average share price. *Weekly volatility* is the standard deviation of average daily share prices divided by weekly average share prices over one week. *Weekly FOAC* is the absolute value of the (weekly) regression coefficient of the daily return in *t* on the daily return in *t-1*. We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *WEEK w × Treated* is an interaction term of a dummy variable for week *w* with a dummy variable for treated French stocks.

To tackle this potential problem for our estimation, we generate an alternative pre-matched sample that we can use for robustness checks. In doing this, we adjust our propensity score matching strategy and exclusively consider *Trading volume* and *Weekly volatility* as matching characteristics. Hence, we do not consider *Weekly volatility* and *Daily volatility* as matching characteristics.[2] Using this alternative sample as the control group for our treatment group and re-estimate Equation (A1), we obtain the following regression coefficients for *WEEK×TREATED* dummy variables (see Table A2). In this setting, we observe more robust common trends for *Weekly volatility*.

However, this comes at the price of weaker common trends for *Daily volatility.* Hence, it seems to be helpful to consider both samples for further analysis. We use the pre-matched sample based on three characteristics (*Trading volume*, *Daily volatility*, *Weekly volatility*) as our baseline control group and the sample based on two characteristics (*Trading volume* and *Weekly volatility*) as our alternative control group for robustness checks (Online Appendix B).

[2] Note that using *Weekly FOAC* as a matching characteristic resulted in problems as the logistic regression models did not converge in all specifications. In addition, using *Weekly FOAC* resulted in a lower number of firms in the pre-matched sample. As we do not observe any significant differences in trends for *Weekly FOAC* (see Tables A1 to A3), we abstain from using this variable as a matching characteristic.

Table A2

Weekly Placebo Tests on Common Trends: Alternative control group

Model	(1)	(2)	(3)	(3)
Variables	Trading volume	Daily volatiilty	Weekly volatility	Weekly FOAC
WEEK 1 × Treated	-0.0203	-0.000586	-0.00257	-0.0360
	(0.0429)	(0.00159)	(0.00231)	(0.0570)
WEEK 2 × Treated	-0.00685	0.00190	-0.00307	-0.0359
	(0.0488)	(0.00143)	(0.00224)	(0.0584)
WEEK 3 × Treated	-0.0256	0.00175	-0.00331	0.00534
	(0.0470)	(0.00155)	(0.00209)	(0.0696)
WEEK 4 × Treated	-0.0656	0.00174	-0.00180	-0.0864*
	(0.0573)	(0.00130)	(0.00208)	(0.0499)
WEEK 5 × Treated	0.0676	0.00313**	-0.00177	0.154
	(0.0586)	(0.00121)	(0.00197)	(0.106)
WEEK 6 × Treated	0.0947	0.00324**	-0.00295	0.0336
	(0.0671)	(0.00129)	(0.00202)	(0.108)
WEEK 7 × Treated	-0.0991*	-0.00146	-0.00213	-0.0374
	(0.0565)	(0.00129)	(0.00189)	(0.0485)
WEEK 8 × Treated	-0.0578	0.000523	-0.00236	-0.0673
	(0.0647)	(0.00166)	(0.00216)	(0.0582)
WEEK 9 × Treated	-0.0174	0.00189	-0.00220	0.0623
	(0.0673)	(0.00145)	(0.00233)	(0.0545)
WEEK 10 × Treated	-0.00165	-0.000271	-0.00311	0.00858
	(0.0654)	(0.00142)	(0.00208)	(0.0544)
WEEK 11 × Treated	-0.0157	-0.00108	-0.00200	-0.0828*
	(0.0656)	(0.00154)	(0.00194)	(0.0459)
WEEK 12 × Treated	-0.0151	-0.00282*	-0.00336	0.0719
	(0.0674)	(0.00157)	(0.00234)	(0.0565)
WEEK 13 × Treated	-0.0114	-0.000155	-0.00209	-0.0352
	(0.0737)	(0.00142)	(0.00214)	(0.0632)
WEEK 14 × Treated	-0.0209	-0.000498	-0.00257	0.0668
	(0.0698)	(0.00129)	(0.00197)	(0.0532)
WEEK 15 × Treated	0.0155	2.86e-06	-0.00197	-0.0730
	(0.0771)	(0.00151)	(0.00243)	(0.0621)
WEEK 16 × Treated	-0.0255	-0.00407***	-0.00233	-0.0466
	(0.0682)	(0.00138)	(0.00181)	(0.0443)
WEEK 17 × Treated	0.00983	0.00120	-0.00374*	0.0335
	(0.0755)	(0.00161)	(0.00210)	(0.0494)
Stock FE	YES	YES	YES	YES
Week FE	YES	YES	YES	YES
Observations	17,399	17,399	3,714	3,581
Adjusted R^2	0.956	0.372	0.400	0.0377

Notes: The treatment group consists of treated French stocks and the control group comprises matched German and UK large-cap stocks. *Trading volume* is the logarithm of the number of traded shares (in thousands). *Daily volatility* is the difference between the maximum and the minimum price divided by the average share price. *Weekly volatility* is the standard deviation of average daily share prices divided by weekly average share prices over one week. *Weekly FOAC* is the absolute value of the (weekly) regression coefficient of the daily return in *t* on the daily return in *t-1*. We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *WEEK w × Treated* is an interaction term of a dummy variable for week *w* with a dummy variable for treated French stocks.

Finally, we estimate Equation (A1) for a sample with the substitute stocks as an alternative treatment group and our baseline selection of control stocks (based on a propensity score matching with three matching characteristics) as the control group. We report corresponding results in Table A3. Similar to Table A1, we do not find evidence for persistent differences in trends. That also holds if we use *Weekly volatility* as the dependent variable. Therefore, we

conclude that there is a common trend between our group of substitute stocks (as an alternative treatment group) and our control stocks for the period before the announcement of the French FTT.

Table A3
Weekly Placebo Tests on Common Trends: Substitute stocks

Model	(1)	(2)	(3)	(3)
Variables	Trading volume	Daily volatiilty	Weekly volatility	Weekly FOAC
WEEK 1 × Substitute	0.0367	0.000412	-0.00467*	0.00609
	(0.0568)	(0.00155)	(0.00275)	(0.0617)
WEEK 2 × Substitute	0.0350	2.40e-05	-0.00636**	-0.110*
	(0.0544)	(0.00161)	(0.00283)	(0.0602)
WEEK 3 × Substitute	-0.0986	0.00137	-0.000298	0.00755
	(0.0737)	(0.00137)	(0.00216)	(0.0704)
WEEK 4 × Substitute	0.0360	0.000712	0.00161	-0.0726
	(0.0682)	(0.00155)	(0.00200)	(0.0597)
WEEK 5 × Substitute	0.0186	0.00267**	-0.00535**	0.0467
	(0.0693)	(0.00121)	(0.00214)	(0.110)
WEEK 6 × Substitute	-0.0554	0.00119	-0.00229	0.0408
	(0.0905)	(0.00140)	(0.00216)	(0.111)
WEEK 7 × Substitute	-0.0936	0.00206	-0.00316	-0.0609
	(0.0605)	(0.00142)	(0.00203)	(0.0530)
WEEK 8 × Substitute	-0.00162	0.00390***	-0.000688	0.00933
	(0.0769)	(0.00131)	(0.00245)	(0.0658)
WEEK 9 × Substitute	-0.0529	0.00341**	0.000372	-0.00810
	(0.0850)	(0.00169)	(0.00249)	(0.0693)
WEEK 10 × Substitute	-0.0348	0.00255*	-0.00289	-0.0132
	(0.0801)	(0.00139)	(0.00264)	(0.0694)
WEEK 11 × Substitute	-0.0106	0.00180	-0.000994	-0.0874
	(0.107)	(0.00168)	(0.00257)	(0.0636)
WEEK 12 × Substitute	-0.00303	0.00217*	-0.00317	0.0413
	(0.0869)	(0.00128)	(0.00237)	(0.0674)
WEEK 13 × Substitute	-0.00866	0.00190	-0.00259	-0.134
	(0.0894)	(0.00156)	(0.00216)	(0.0923)
WEEK 14 × Substitute	-0.0162	0.000719	-0.000573	0.0352
	(0.105)	(0.00156)	(0.00223)	(0.0597)
WEEK 15 × Substitute	0.0168	0.00107	-0.00176	-0.166
	(0.109)	(0.00169)	(0.00290)	(0.106)
WEEK 16 × Substitute	-0.0234	0.000709	-0.00383	-0.117***
	(0.0963)	(0.00135)	(0.00233)	(0.0441)
WEEK 17 × Substitute	0.147	0.00274	-0.00364	-0.0824
	(0.103)	(0.00188)	(0.00253)	(0.0595)
Stock FE	YES	YES	YES	YES
Week FE	YES	YES	YES	YES
Observations	17,399	17,399	3,714	3,581
Adjusted R^2	0.956	0.372	0.400	0.0377

Notes: The treatment group consists of substitute stocks, and the control group comprises matched German and UK large-cap stocks. *Trading volume* is the logarithm of the number of traded shares (in thousands). *Daily volatility* is the difference between the maximum and the minimum price divided by the average share price. *Weekly volatility* is the standard deviation of average daily share prices divided by weekly average share prices over one week. *Weekly FOAC* is the absolute value of the (weekly) regression coefficient of the daily return in *t* on the daily return in *t-1*. We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *WEEK w × Substitute* is an interaction term of a dummy variable for week *w* with a dummy variable for substitute stocks.

ONLINE APPENDIX B: ALTERNATIVE MATCHED SAMPLE

We start by addressing concerns related to our propensity score matching strategy. It might be that our findings hold exclusively for a specific pre-matched sample of control stocks as a reference point. To rule out such concerns, we re-estimate all models for an unmatched sample considering all German and UK large-cap stocks with a minimum market capitalization of €1 billion at the beginning of 2012. We first re-estimate the long-run and short-run tests of the paper's Equation (2) and Equation (3) on *Trading volume* (see Table 2 and Table 3 from the paper) and report the results in Table B1. For brevity, we restrict our short-run tests to the specification identifying abnormal trading volumes in the second half of June (Columns 1 to 3 of Table 3 from the paper).

The results of Table B1 confirm our previous findings on anticipation effects and short-run treatment effects. Again, we find a significant increase in *Trading volume* in the overall anticipation period (Models 1 to 3) and in the last two weeks of July 2012 (Models 4 to 6). We also find a significant reduction of trading activity in all specifications in August 2012. Unlike our main setting, we further observe a significant long-run reduction of Trading volume for the non-SLP stocks of 10.9 percent. This significant outcome results from a slight increase in the regression coefficient and a small decrease in the standard error. Hence, our findings in the main setting should not be taken as evidence that there has been *no effect* of the French FTT on trading volumes of treated stocks but rather as insufficient evidence that there has been a corresponding effect of the French FTT.

Table B1
Unmatched Control Group: Trading Volume

Model	1	2	3	4	5	6
Observation Period	Long-run	Long-run	Long-run	Short-run	Short-run	Short-run
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.0515***	**0.0946*****	**0.0138**	**--**	**--**	**--**
	(0.0282)	**(0.0261)**	**(0.0429)**	**--**	**--**	**--**
ASDiD	**--**	**--**	**--**	**0.146*****	**0.149*****	**0.144*****
	--	**--**	**--**	**(0.0266)**	**(0.0296)**	**(0.0381)**
SDiD	**-0.190*****	**-0.0690***	**-0.296*****	**-0.198*****	**-0.170*****	**-0.224*****
	(0.0435)	**(0.0366)**	**(0.0665)**	**(0.0261)**	**(0.0278)**	**(0.0384)**
LDiD	**-0.0392**	**0.0462**	**-0.114****	**--**	**--**	**--**
	(0.0387)	**(0.0354)**	**(0.0565)**	**--**	**--**	**--**
Stock fixed effects	YES	YES	YES	YES	YES	YES
Month fixed effects	YES	YES	YES	YES	YES	YES
Observations	113,775	97,910	99,855	25,556	22,037	22,436
Number of stocks	403	346	355	403	346	355
Adjusted R^2	0.936	0.914	0.937	0.949	0.934	0.950

Notes: The treatment group consists of treated French stocks. The control group comprises unmatched German and UK large-cap stocks. We perform separate regressions for stocks that participate and do not participate in the SLP program. The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy with one in the anticipation period from March 14, 2012, until July 31, 2012. *ASPeriod* is a dummy with a value of one in the short-run anticipation period from July 16 to July 31, 2012. *LTPeriod* (*STperiod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD, ASDiD*, *SDiD*, and *LDiD* are the interaction terms of *APeriod*, *ASPeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks.

In Table B2, we report our results for the unmatched sample on Daily volatility, Weekly volatility, and Weekly FOAC (see also Table 5 from the paper). Again, we do not find significant evidence on significant long-run effects on intraday volatility or a weekly measure for first-order autocorrelation. However, we find some evidence that the French FTT might have reduced our weekly measure of volatility. Compared to the average values of Weekly volatility in Table 1 from the paper, the coefficients in Table B2 suggest a volatility reduction ranging from 9.5 percent (SLP stocks) to 13.6 percent (non-SLP stocks).

Table B2

Unmatched Control Group: Volatility and First-Order Autocorrelation

Model	1	2	3	4	5	6	7	8	9
Dependent variable	Daily volatility	Daily volatility	Daily volatility	Weekly volatility	Weekly volatility	Weekly volatility	Weekly FOAC	Weekly FOAC	Weekly FOAC
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.00142*** **	**0.00211*** **	**0.000814**	**-0.000414**	**9.43e-05**	**-0.000848**	**-0.0250* **	**-0.0444** **	**-0.00751**
	(0.000458)	**(0.000426)**	**(0.000705)**	**(0.000505)**	**(0.000528)**	**(0.000765)**	**(0.0139)**	**(0.0182)**	**(0.0188)**
SDiD	**-0.000947**	**-1.78e-05**	**-0.00177** **	**-0.00212*** **	**-0.00162* **	**-0.00255*** **	**-0.0581*** **	**-0.0815*** **	**-0.0370**
	(0.000645)	**(0.000799)**	**(0.000870)**	**(0.000657)**	**(0.000845)**	**(0.000882)**	**(0.0190)**	**(0.0194)**	**(0.0282)**
LDiD	**-0.000509**	**0.000102**	**-0.00104**	**-0.00173*** **	**-0.00141** **	**-0.00201** **	**0.00366**	**-0.00947**	**0.0154**
	(0.000699)	**(0.000794)**	**(0.000999)**	**(0.000545)**	**(0.000615)**	**(0.000785)**	**(0.0135)**	**(0.0196)**	**(0.0165)**
Stock FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	113,775	97,910	99,855	23,952	20,607	21,072	22,748	19,582	19,916
Number of stocks	403	346	355	403	346	355	403	346	355
Adjusted R2	0.282	0.277	0.275	0.218	0.214	0.207	0.00448	0.00437	0.00495

Notes: The treatment group consists of treated French stocks. The control group comprises unmatched German and UK large-cap stocks. We perform separate regressions for stocks that participate and do not participate in the SLP program. *Daily volatility* is the difference between the maximum and the minimum price divided by the average share price. *Weekly volatility* is the standard deviation of average daily share prices over one week divided by weekly average share price. *Weekly FOAC* is the absolute value of the (weekly) regression coefficient of a regression of the daily return in *t+1* on the daily return in *t*. We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy with a value of one in the anticipation period from March 14, 2012, until July 31, 2012. *LTPeriod* (*STperiod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD*, *SDiD*, and *LDiD* are the interaction terms of *APeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks.

Table B3 reports results for a reallocation of trading activity to substitute stocks (see also Table 5 from the paper). Our results confirm our previous findings. Again, we find evidence for abnormal trading volumes of substitute stocks in the short-run and the long run. Apart from a short-run anticipation effect (Model 6), that holds exclusively for SLP substitute stocks.

Table B3

Unmatched Control Group: Reallocation of Trading Volume

Model	1	2	3	4	5	6
Time window	Long-run	Long-run	Long-run	Short-run	Short-run	Short-run
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.0229**	**0.0749****	**-0.0502**	**0.130*****	**0.136*****	**0.120****
	(0.0407)	**(0.0295)**	**(0.0822)**	**(0.0373)**	**(0.0465)**	**(0.0562)**
SDiD	**0.118***	**0.233*****	**-0.0431**	**0.0829****	**0.109****	**0.0460**
	(0.0670)	**(0.0531)**	**(0.130)**	**(0.0343)**	**(0.0424)**	**(0.0516)**
LDiD	**0.0547**	**0.145****	**-0.0726**	**--**	**--**	**--**
	(0.0552)	**(0.0589)**	**(0.0890)**	**--**	**--**	**--**
Stock fixed effects	YES	YES	YES	YES	YES	YES
Month fixed effects	YES	YES	YES	YES	YES	YES
Observations	97,341	91,784	89,547	21,884	20,649	20,152
Number of stocks	344	325	317	344	325	317
Adjusted R^2	0.914	0.914	0.911	0.936	0.937	0.935

Notes: The treatment group consists of substitute stocks, and the control group comprises unmatched German and UK large-cap stocks. We perform separate regressions for stocks that participate and do not participate in the SLP program. The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy with one in the anticipation period from March 14, 2012, until July 31, 2012. *LTPeriod* (*STperiod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD, SDiD*, and *LDiD* are the interaction terms of *APeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for substitute stocks.

As already discussed in Online Appendix A, we generate an alternative control group using *Trading volume* and *Weekly volatility* as our characteristics for propensity score matching. Thus, unlike our baseline matching strategy, we do not consider *Daily volatility* as a matching characteristic. This alternative matched control group seems to have a better common trend for *Weekly volatility* and a weaker common trend for *Daily volatility* than our baseline control group (see Online Appendix A). In this online appendix, we use this alternative control group to re-estimate our main empirical tests.

Table B4
Alternative Matched Control Group: Trading Volume

Model	1	2	3	4	5	6
Time window	Long-run	Long-run	Long-run	Short-run	Short-run	Short-run
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.0759***	**0.119*****	**0.0382**	**--**	**--**	**--**
	(0.0390)	**(0.0376)**	**(0.0508)**	**--**	**--**	**--**
ASDiD	**--**	**--**	**--**	**0.147*****	**0.150*****	**0.145*****
	--	**--**	**--**	**(0.0359)**	**(0.0382)**	**(0.0451)**
SDiD	**-0.128****	**-0.00760**	**-0.235*****	**-0.169*****	**-0.140*****	**-0.195*****
	(0.0537)	**(0.0483)**	**(0.0736)**	**(0.0320)**	**(0.0334)**	**(0.0426)**
LDiD	**0.00686**	**0.0926****	**-0.0681**	**--**	**--**	**--**
	(0.0491)	**(0.0466)**	**(0.0642)**	**--**	**--**	**--**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Observations	58,543	42,678	44,623	13,120	9,601	10,000
Number of stocks	207	150	159	207	150	159
Adjusted R^2	0.939	0.904	0.937	0.949	0.925	0.947

Notes: The treatment group consists of treated French stocks. The control group comprises alternatively matched German and UK large-cap stocks. We perform separate regressions for stocks that participate and do not participate in the SLP program. The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy with one in the anticipation period from March 14, 2012, until July 31, 2012. *ASPeriod* is a dummy with a value of one in the short-run anticipation period from July 16 to July 31, 2012. *LTPeriod* (*STperiod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD, ASDiD*, *SDiD*, and *LDiD* are the interaction terms of *APeriod*, *ASPeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks.

We start with our baseline regressions on *Trading volume* and report results in Columns 1 to 3 of Table B4. Corresponding to Table 2 from the paper, we find evidence that a positive and significant anticipation effect is more prominent for SLP stocks. A negative and significant short-run treatment effect is more extensive for non-SLP stocks. Like our baseline, we also find no significant evidence for a long-run reduction of the trading volume. Instead (and different from our baseline results), we even see a statistically significant long-run increase in

the trading activity of SLP stocks compared to the alternative control group. Potential explanations for this outcome could be reallocating trading activity from treated non-SLP stocks to treated SLP stocks or higher trading frequencies due to the FTT exemption for day trading. However, as we do not have corresponding results for our baseline tests, these findings should be interpreted cautiously. Columns 4 to 6 report our short-run tests with a short-run anticipation period of about two weeks from Equation (3). Hence, *ASDiD* takes a value of one if a) the stock belongs to the treatment period and b) the trading day falls from July 16 to July 31, 2012. Our findings confirm the results of Table 3. Thus, using the alternative sample, we still find a large increase in trading activity two weeks before the effective date of the French FTT for treated SLP and non-SLP stocks.

Table B5
Alternative Matched Control Group: Volatility and First-Order Autocorrelation

Model	1	2	3	4	5	6	7	8	9
Dependent variable	Daily volatility	Daily volatility	Daily volatility	Weekly volatility	Weekly volatility	Weekly volatility	Weekly FOAC	Weekly FOAC	Weekly FOAC
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.00199*** **	**0.00268*** **	**0.00139* **	**0.000422**	**0.000932**	**-1.19e-05**	**-0.0247**	**-0.0449** **	**-0.00716**
	(0.000562)	**(0.000537)**	**(0.000777)**	**(0.000593)**	**(0.000614)**	**(0.000827)**	**(0.0165)**	**(0.0203)**	**(0.0207)**
SDiD	**-0.000261**	**0.000664**	**-0.00108**	**-0.00106**	**-0.000564**	**-0.00149**	**-0.0186**	**-0.0425* **	**0.00275**
	(0.000784)	**(0.000916)**	**(0.000978)**	**(0.000787)**	**(0.000951)**	**(0.000983)**	**(0.0222)**	**(0.0227)**	**(0.0304)**
LDiD	**0.000721**	**0.00133**	**0.000184**	**-0.000585**	**-0.000251**	**-0.000871**	**0.00996**	**-0.00364**	**0.0215**
	(0.000788)	**(0.000875)**	**(0.00106)**	**(0.000623)**	**(0.000687)**	**(0.000841)**	**(0.0156)**	**(0.0210)**	**(0.0183)**
Stock FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	58,543	42,678	44,623	12,286	8,941	9,406	11,746	8,580	8,914
Number of stocks	207	150	159	207	150	159	207	150	159
Adjusted R^2	0.328	0.324	0.314	0.277	0.279	0.264	0.0179	0.0156	0.0192

Notes: The treatment group consists of treated French stocks. The control group comprises alternatively matched German and UK large-cap stocks. We perform separate regressions for stocks that participate and do not participate in the SLP program. *Daily volatility* is the difference between the maximum and the minimum price divided by the average share price. *Weekly volatility* is the standard deviation of average daily share prices divided by weekly average share prices over one week. *Weekly FOAC* is the absolute value of the (weekly) regression coefficient of a regression of the daily return in *t+1* on the daily return in *t*. We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy with one in the anticipation period from March 14, 2012, until July 31, 2012. *LTPeriod* (*STperiod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD*, *SDiD*, and *LDiD* are the interaction terms of *APeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks.

In Table B5, we report results for *Daily volatility*, *Weekly volatility*, and *Weekly FOAC.* Confirming Table 4 in our paper, we have no indication for significant long-run effects on *Daily volatility*, *Weekly volatility*, and *Weekly FOAC*. In Table B6, we report results for a

reallocation of trading volumes. For the short-run tests, we replace the interaction term for the anticipation period *ADiD* (March 14 until July 31, 2012) with an interaction term for the short-run anticipation period *ASDiD* (July 16 to July 31, 2012). Confirming our results in Table 5 and H3, we find significant and positive short-run and long-run effects on the trading volumes of substitute stocks being part of the SLP program.

Table B6
Alternative Matched Control Group: Reallocation of Trading Volume

Model	1	2	3	4	5	6
Time window	Long-run	Long-run	Long-run	Short-run	Short-run	Short-run
Substitute stocks	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.0425**	**0.0944****	**-0.0317**	**--**	**--**	**--**
	(0.0489)	**(0.0398)**	**(0.0871)**	**--**	**--**	**--**
ASDiD	**--**	**--**	**--**	**0.131*****	**0.137*****	**0.121***
	--	**--**	**--**	**(0.0444)**	**(0.0524)**	**(0.0613)**
SDiD	**0.175****	**0.290*****	**0.0128**	**0.112*****	**0.139*****	**0.0753**
	(0.0742)	**(0.0616)**	**(0.134)**	**(0.0390)**	**(0.0463)**	**(0.0549)**
LDiD	**0.0962**	**0.187*****	**-0.0324**	**--**	**--**	**--**
	(0.0632)	**(0.0663)**	**(0.0945)**	**--**	**--**	**--**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Observations	42,109	36,552	34,315	9,448	8,213	7,716
Number of stocks	148	129	121	148	129	121
Adjusted R^2	0.908	0.913	0.893	0.928	0.933	0.917

Notes: The treatment group consists of treated French stocks. The control group comprises alternatively matched German and UK large-cap stocks. We perform separate regressions for stocks that participate and do not participate in the SLP program. The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy with one in the anticipation period from March 14, 2012, until July 31, 2012. *LTPeriod* (*STperiod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD, SDiD*, and *LDiD* are the interaction terms of *APeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for substitute stocks.

ONLINE APPENDIX C: BALANCED MATCHED SAMPLE

While we do not find an optimal match for three treated stocks in our baseline matching approach (Section II, Subsection A of our paper), we still include these stocks in our baseline sample. In this online appendix, we test if excluding these stocks changes our results (balanced matched sample with 102 treated stocks and 102 control stocks). We report selected results for our long-run tests (consistent with Table 2) and our short-run tests (consistent with Table 3) on *Trading volume* in Models 1 to 3 and Models 4 to 6 of Table C1. Table C1 confirms our baseline results qualitatively and quantitatively.

Table C1
Balanced Matched Sample: Trading Volume

Model	1	2	3	4	5	6
Time window	Long-run	Long-run	Long-run	Short-run	Short-run	Short-run
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.0722***	**0.111*****	**0.0374**	**--**	**--**	**--**
	(0.0375)	**(0.0359)**	**(0.0503)**	**--**	**--**	**--**
ASDiD	**--**	**--**	**--**	**0.124*****	**0.128*****	**0.120*****
	--	**--**	**--**	**(0.0349)**	**(0.0372)**	**(0.0446)**
SDiD	**-0.167*****	**-0.0456**	**-0.278*****	**-0.199*****	**-0.166*****	**-0.229*****
	(0.0510)	**(0.0449)**	**(0.0727)**	**(0.0309)**	**(0.0323)**	**(0.0421)**
LDiD	**-0.0236**	**0.0648**	**-0.103**	**--**	**--**	**--**
	(0.0487)	**(0.0459)**	**(0.0647)**	**--**	**--**	**--**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Observations	58,168	42,714	44,248	13,047	9,610	9,927
Number of stocks	204	150	156	204	150	156
Adjusted R^2	0.946	0.929	0.946	0.954	0.943	0.954

Notes: The treatment group consists of treated French stocks. The control group comprises balanced matched German and UK large-cap stocks. We perform separate regressions for stocks that participate and do not participate in the SLP program. The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy with one in the anticipation period from March 14, 2012, until July 31, 2012. *ASPeriod* is a dummy with a value of one in the short-run anticipation period from July 16 to July 31, 2012. *LTPeriod* (*STperiod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD, ASDiD*, *SDiD*, and *LDiD* are the interaction terms of *APeriod*, *ASPeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks.

Table C2 reports our alternative results for Daily volatility, Weekly volatility, and Weekly FOAC if we use the balanced matched sample. Again we do not find relevant deviations from our baseline analysis in Table 4 of the main paper. That holds from a qualitative as well as from a quantitative perspective. Concluding, our results are robust to the inclusion or the exclusion

of the three treated stocks, for which our baseline propensity score matching strategy does not provide an optimal pre-matched control stock.

Table C2
Balanced Matched Sample: Volatility and First-Order Autocorrelation

Model	1	2	3	4	5	6	7	8	9
Dependent variable	Daily volatility	Daily volatility	Daily volatility	Weekly volatility	Weekly volatility	Weekly volatility	Weekly FOAC	Weekly FOAC	Weekly FOAC
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.00166*** **	**0.00228*** **	**0.00109**	**0.000175**	**0.000698**	**-0.000287**	**-0.0228**	**-0.0441** **	**-0.00413**
	(0.000544)	**(0.000515)**	**(0.000775)**	**(0.000597)**	**(0.000611)**	**(0.000851)**	**(0.0158)**	**(0.0197)**	**(0.0202)**
SDiD	**-0.000205**	**0.000685**	**-0.00101**	**-0.00120**	**-0.000555**	**-0.00177***	**-0.0270**	**-0.0518** **	**-0.00468**
	(0.000717)	**(0.000856)**	**(0.000938)**	**(0.000750)**	**(0.000920)**	**(0.000956)**	**(0.0236)**	**(0.0240)**	**(0.0315)**
LDiD	**0.000484**	**0.00110**	**-7.48e-05**	**-0.000823**	**-0.000477**	**-0.00113**	**0.00543**	**-0.00832**	**0.0173**
	(0.000761)	**(0.000845)**	**(0.00106)**	**(0.000612)**	**(0.000670)**	**(0.000852)**	**(0.0160)**	**(0.0213)**	**(0.0188)**
Stock FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	58,168	42,714	44,248	12,168	8,946	9,288	11,722	8,591	8,890
Number of stocks	204	150	156	204	150	156	204	150	156
Adjusted R^2	0.332	0.327	0.316	0.284	0.287	0.272	0.0167	0.0135	0.0177

Notes: The treatment group consists of treated French stocks. The control group comprises balanced matched German and UK large-cap stocks. We perform separate regressions for stocks that participate and do not participate in the SLP program. *Daily volatility* is the difference between the maximum and the minimum price divided by the average share price. *Weekly volatility* is the standard deviation of average daily share prices divided by weekly average share prices over one week. *Weekly FOAC* is the absolute value of the (weekly) regression coefficient of a regression of the daily return in $t+1$ on the daily return in t. We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy with one in the anticipation period from March 14, 2012, until July 31, 2012. *LTPeriod* (*STperiod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD*, *SDiD*, and *LDiD* are the interaction terms of *APeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks.

ONLINE APPENDIX D: ALTERNATIVE VARIABLE SPECIFICATIONS

In this online appendix, we analyze alternative definitions of our dependent variables for trading volume (price-adjusted trading volume), long-run volatility (monthly volatility), and first-order autocorrelation (monthly FOAC). Price-adjusted trading volume is the logarithm of the number of traded shares (in thousands) multiplied with the daily closing price in local currency. Corresponding to weekly volatility, monthly volatility is the standard deviation of closing prices of a stock over one month, divided by the average closing price of that month. Corresponding to weekly first-order autocorrelation, monthly first-order autocorrelation is the estimated first-order autocorrelation of daily returns over one month.

The results in tables D1, D2, and D3 widely confirm our previous findings. Compared to our baseline results in Table 2, we find more minor anticipation effects in Columns 1 to 3 of Table D1.

Table D1
Alternative Variable Definitions: Price-Adjusted Trading Volume

Model	1	2	3	4	5	6
Time window	Long-run	Long-run	Long-run	Short-run	Short-run	Short-run
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.0506**	**0.0938****	**0.0127**	--	--	--
	(0.0386)	**(0.0375)**	**(0.0504)**	--	--	--
ASDiD	--	--	--	**0.125*****	**0.127*****	**0.124*****
	--	--	--	**(0.0358)**	**(0.0365)**	**(0.0472)**
SDiD	**-0.187*****	**-0.0609**	**-0.299*****	**-0.188*****	**-0.156*****	**-0.217*****
	(0.0525)	**(0.0471)**	**(0.0726)**	**(0.0310)**	**(0.0323)**	**(0.0422)**
LDiD	**-0.0559**	**0.0200**	**-0.122***	--	--	--
	(0.0541)	**(0.0509)**	**(0.0715)**	--	--	--
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Observations	58,579	42,714	44,659	13,129	9,610	10,009
Number of stocks	207	150	159	207	150	159
Adjusted R^2	0.962	0.958	0.966	0.968	0.966	0.972

Notes: The treatment group consists of treated French stocks. The control group comprises matched German and UK large-cap stocks. We perform separate regressions for stocks that participate and do not participate in the SLP program. The dependent variable is the logarithm of the product of the number of treaded shares of a trading day (in thousands) with the average stock price of that trading day. We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy with one in the anticipation period from March 14, 2012, until July 31, 2012. *ASPeriod* is a dummy with a value of one in the short-run anticipation period from July 16 to July 31, 2012. *LTPeriod* (*STperiod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD*, *ASDiD*, *SDiD*, and *LDiD* are the interaction terms of *APeriod*, *ASPeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks.

We also find (weakly) significant and adverse long-run treatment effects for non-SLP stocks suggesting a reduction of trading activity of 11.7 percent for this type of stocks. The short-run impact documented in Columns 4 to 6 in Table D1 is clearly in line with Table 3 in our paper.

The results for *Monthly FAOC* in Table D2 confirm our findings for *Weekly FOAC* in Table 4. However, unlike W*eekly volatility*, Table D2 provides evidence for a significant reduction of *Monthly volatility* after FTT treatment. That holds especially for the non-SLP stocks. This is in line with the results of Colliard and Hoffmann (2017) and our research suggesting a more vigorous response of non-SLP stocks to the French FTT reform (see also Table D1). Comparing the coefficients of Table D2 with the descriptive statistics in Table 1 and Table J1 suggests that the French FTT reduced *Monthly volatility* of the treated French stocks by 10.1 percent to 16.4 percent, with a more substantial effect on the less liquid non-SLP stocks.

Table D2

Alternative Variable Definitions: Monthly Volatility and First-Order Autocorrelation

Model	1	2	3	4	5	6
Dependent variable	Monthly volatility	Monthly volatility	Monthly volatility	Monthly FOAC	Monthly FOAC	Monthly FOAC
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**-0.000998**	**0.00103**	**-0.00272**	**0.0297****	**0.0453*****	**0.0159**
	(0.00167)	**(0.00202)**	**(0.00217)**	**(0.0135)**	**(0.0154)**	**(0.0161)**
SDiD	**-0.00439****	**-0.00278**	**-0.00575****	**-0.00419**	**0.0166**	**-0.0224**
	(0.00193)	**(0.00260)**	**(0.00229)**	**(0.0228)**	**(0.0283)**	**(0.0276)**
LDiD	**-0.00303***	**-0.000769**	**-0.00493****	**0.0131**	**0.0153**	**0.0112**
	(0.00164)	**(0.00197)**	**(0.00206)**	**(0.0131)**	**(0.0157)**	**(0.0152)**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Observations	2,897	2,100	2,225	2,870	2,100	2,198
Number of stocks	207	150	159	207	150	159
Adjusted R^2	0.437	0.429	0.429	0.0388	0.0442	0.0295

Notes: The treatment group consists of treated French stocks. The control group comprises unmatched German and UK large-cap stocks. We perform separate regressions for stocks that participate and do not participate in the SLP program. *Monthly volatility* is the standard deviation of average daily share prices divided by monthly average share prices over one month. *Monthly FOAC* is the absolute value of the (monthly) regression coefficient of a regression of the daily return in *t+1* on the daily return in *t*. We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *APeriod* is a dummy with one in the anticipation period from March 14, 2012, until July 31, 2012. *LTPeriod* (*STperiod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *ADiD*, *SDiD*, and *LDiD* are the interaction terms of *APeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks.

Table D3 documents our long-run and short-run results for a reallocation of price-adjusted trading activity in local currency. Similar to Table 5, we find a significant long-run and short-run increase in trading activity for substitute stocks, especially for those participating in the SLP program. Table D3 confirms our findings of Table 5.

Table D3

Alternative Variable Definitions: Reallocation of Price-adjusted Trading Volume

Model	1	2	3	4	5	6
Time window	Long-run	Long-run	Long-run	Short-run	Short-run	Short-run
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.0106**	**0.0843***	**-0.0944**	**--**	**--**	**--**
	(0.0580)	**(0.0475)**	**(0.107)**	**--**	**--**	**--**
ASDiD	**--**	**--**	**--**	**0.116*****	**0.133****	**0.0933**
	--	**--**	**--**	**(0.0442)**	**(0.0523)**	**(0.0615)**
SDiD	**0.0837**	**0.254*****	**-0.158**	**0.0820****	**0.122*****	**0.0254**
	(0.0869)	**(0.0712)**	**(0.158)**	**(0.0380)**	**(0.0412)**	**(0.0589)**
LDiD	**-0.00227**	**0.128***	**-0.186**	**--**	**--**	**--**
	(0.0785)	**(0.0749)**	**(0.129)**	**--**	**--**	**--**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Observations	42,145	36,588	34,351	9,457	8,222	7,725
Number of stocks	148	129	121	148	129	121
Adjusted R^2	0.963	0.962	0.966	0.971	0.970	0.974

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

ONLINE APPENDIX E: SEASONALITY EFFECTS

An important source of concern is seasonality. Colliard and Hoffmann (2017) provide evidence in their Online Appendix D that the short-run treatment effects in August 2012 are partially driven by seasonality effects resulting in abnormally low trading frequencies of French stocks in August (e.g., due to summer holidays and similar reasons). Therefore, short-run treatment effects in August 2012 could be biased upwards. To account for potential seasonality effects, we perform additional triple difference regressions of the following form:

$$\begin{aligned} Y_{it} = {} & \alpha + \beta_1 \cdot APeriodS_t + \beta_2 \cdot APeriodS \times 2012_t + \beta_3 \cdot APeriodS \times France_{it} \\ & + \beta_4 \cdot ADiDiD_{it} + \beta_5 \cdot STPeriodS_t + \beta_6 \cdot STPeriodS \times 2012_t \\ & + \beta_7 \cdot STPeriodS \times France_{it} + \beta_8 \cdot SDiDiD_{it} + \beta_9 \cdot LTPeriodS_t \\ & + \beta_{10} \cdot LTPeriodS \times 2012_t + \beta_{11} \cdot LTPeriodS \times France_{it} \\ & + \beta_{12} \cdot LDiDiD_{it} + \gamma_k \cdot C_{kit} + \psi_t + \upsilon_i + u_{it}. \end{aligned} \quad \text{(E1)}$$

In this model, $APeriodS_t$, $STPeriodS_t$, and $LTPeriodS_t$ are variables controlling for seasonal effects in the anticipation period, the short-run treatment period, and the long-run treatment period. Thus, the variables have a value of one for observations between March 14 and July 31 ($APeriodS_t$), August 1 and August 31 ($STPeriodS_t$), and September 1 and December 31 ($LTPeriodS_t$) in all years. $APeriodS \times 2012_t$, $STPeriodS \times 2012_t$, and $LTPeriodS \times 2012_t$ are interaction terms of these seasonal dummy variables and a dummy variable for 2012. Hence, $APeriodS \times 2012_t$, $STPeriodS \times 2012_t$, and $LTPeriodS \times 2012_t$ are equivalent to $APeriod_t$, $STPeriod_t$, and $LTPeriod_t$ in our baseline specification and control for period-specific effects of 2012 that are relevant for the treatment group and the control group.

$APeriodS \times France_{it}$, $STPeriodS \times France_{it}$, and $LTPeriodS \times France_{it}$ are interaction terms of the seasonal dummies with a dummy variable for treated French stocks. These variables control specific effects of French stocks in the corresponding periods observed in 2012 and the control periods. The triple difference interaction terms $ADiDiD_{it}$, $SDiDiD_{it}$, and $LDiDiD_{it}$ identify the impact of the French FTT in the anticipation period, the short-run treatment period, and the

long-run treatment period. These are interaction terms of $APeriodS_t$, $STPeriodS_t$, and $LTPeriodS_t$ with a dummy variable for 2012 and a dummy variable for treated French stocks. We estimate two alternative specifications of Equation (E1). In the first specification, we add observations for two control periods (2011 and 2013) with corresponding triple difference controls ($APeriodS \times 2012_t$, $STPeriodS \times 2012_t$, $LTPeriodS \times 2012_t$, $APeriodS \times France_{it}$, $STPeriodS \times France_{it}$, and $LTPeriodS \times France_{it}$). We include these variables and observations from 2010 to 2014 (four control years) in the second specification. We perform our regressions by OLS and add stock fixed effects and month fixed effects. Petersen (2009) standard errors are clustered at the stock level.

Table E1
Seasonality: Trading Volume

Model	1	2	3	4	5	6
Observation period	2011-2013	2011-2013	2011-2013	2012-2014	2012-2014	2012-2014
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiDiD	**0.142*** **	**0.153*** **	**0.130*** **	**0.0722** **	**0.0945*** **	**0.0513**
	(0.0359)	**(0.0344)**	**(0.0463)**	**(0.0355)**	**(0.0329)**	**(0.0470)**
SDiDiD	**-0.0132**	**0.0529**	**-0.0759**	**-0.0894***	**-0.0239**	**-0.150** **
	(0.0580)	**(0.0546)**	**(0.0771)**	**(0.0528)**	**(0.0489)**	**(0.0724)**
LDiDiD	**-0.0178**	**0.0245**	**-0.0582**	**-0.0734**	**0.00714**	**-0.145** **
	(0.0599)	**(0.0551)**	**(0.0789)**	**(0.0554)**	**(0.0513)**	**(0.0719)**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Triple difference controls	YES	YES	YES	YES	YES	YES
Observations	155,309	112,905	118,446	257,748	187,348	196,264
Number of stocks	207	150	159	207	150	159
Adjusted R^2	0.944	0.922	0.944	0.931	0.908	0.931

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects.

Table E1 reports our results on abnormal anticipation, short-run and long-run effects for trading volumes of treated stocks if we account for potential seasonality effects. Specification 1 accounts for 2011-2013, while Specification 2 considers the more extended observation period from 2010 to 2014. Specification 2 confirms our baseline results in Table 2. Thus, we find significant and positive anticipation effects for all treated stocks (7.4 percent) and especially treated SLP stocks (9.9 percent). Short-run treatment effects are weaker than in the baseline regression but still significant for all stocks (-8.7 percent) and non-SLP stocks

(-14.2 percent). We also find a significant reduction in trading volume for the non-SLP stocks of about 13.7 percent, unlike the baseline setting.

In Specification 1, we still find significant anticipation effects but no significant short-run or long-run treatment effects. Overall, and in line with our baseline results, Table E1 provides strong empirical evidence for H1a (anticipation effects) but only relatively weak evidence on H1b (long-run treatment effects).

Table E2 reports our results on *Daily volatility*, *Weekly volatility,* and *Weekly FOAC* for the entire sample, the SLP stocks, and the non-SLP stocks if the triple difference specification considers seasonality effects. We still find significant and positive short-run treatment effects in the anticipation period for *Daily volatility*, but no significant long-run treatment effects.

However, for *Weekly volatility*, the results of Table E2 suggest a long-run reduction of volatility resulting from the French FTT 2012. This would indicate that the composition effect of the French FTT (Stiglitz, 1989; Summers and Summers, 1989) outweighs the liquidity effect of this transaction tax. Compared to average volatilities in Table 1, the coefficients of *LDiDiD* of *Weekly volatility* are statistically and economically relevant. They suggest a reduction of volatility by 12.0 percent to 13.6 percent. For *Weakly FOAC*, we still do not find much evidence of abnormal changes. There is only one model (Specification 2 for non-SLP stocks) with a significant and positive coefficient for *LDiDiD,* suggesting that the French FTT reduced the pricing efficiency of the treated French stocks.

Table E2
Seasonality: Volatility and First-Order Autocorrelation

Model	1	2	3	4	5	6
Panel A: Daily volatility						
Specification	2011-2013	2011-2013	2011-2013	2012-2014	2012-2014	2012-2014
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiDiD	**0.00279*** **	**0.00335*** **	**0.00212*** **	**0.00167*** **	**0.00232*** **	**0.000954**
	(0.000618)	**(0.000716)**	**(0.000799)**	**(0.000559)**	**(0.000612)**	**(0.000747)**
SDiDiD	**0.00267** **	**0.00252***	**0.00259***	**0.00118**	**0.00111**	**0.00110**
	(0.00118)	**(0.00146)**	**(0.00137)**	**(0.000921)**	**(0.00112)**	**(0.00110)**
LDiDiD	**0.000215**	**0.000387**	**-0.000130**	**7.02e-05**	**0.000389**	**-0.000347**
	(0.00104)	**(0.00118)**	**(0.00136)**	**(0.000838)**	**(0.000950)**	**(0.00111)**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Triple difference controls	YES	YES	YES	YES	YES	YES
Observations	155,309	112,905	118,446	257,748	187,348	196,264
Number of stocks	207	150	159	207	150	159
Adjusted R^2	0.341	0.344	0.324	0.303	0.305	0.290
Panel B: Weekly volatility						
Specification	2011-2013	2011-2013	2011-2013	2012-2014	2012-2014	2012-2014
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiDtD	**0.000541**	**0.000831**	**7.17e-05**	**-5.94e-05**	**0.000202**	**-0.000479**
	(0.000646)	**(0.000735)**	**(0.000850)**	**(0.000611)**	**(0.000678)**	**(0.000831)**
SDiDiD	**0.00157**	**0.00167**	**0.00127**	**0.000406**	**0.000416**	**0.000207**
	(0.00114)	**(0.00131)**	**(0.00143)**	**(0.000973)**	**(0.00113)**	**(0.00122)**
LDiDiD	**-0.00195** **	**-0.00200** **	**-0.00213***	**-0.00180** **	**-0.00177** **	**-0.00202** **
	(0.000897)	**(0.000996)**	**(0.00118)**	**(0.000721)**	**(0.000807)**	**(0.000954)**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Triple difference controls	YES	YES	YES	YES	YES	YES
Observations	32,253	23,441	24,717	53,367	38,789	40,839
Number of stocks	207	150	159	207	150	159
Adjusted R^2	0.283	0.287	0.270	0.0167	0.0135	0.0176
Panel C: Weekly FOAC						
Specification	2011-2013	2011-2013	2011-2013	2012-2014	2012-2014	2012-2014
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiDiD	**-0.0126**	**-0.0402***	**0.0141**	**-0.00660**	**-0.0286**	**0.0135**
	(0.0189)	**(0.0240)**	**(0.0214)**	**(0.0173)**	**(0.0205)**	**(0.0208)**
SDiDiD	**0.0201**	**-0.00215**	**0.0425**	**0.0217**	**0.00997**	**0.0332**
	(0.0278)	**(0.0354)**	**(0.0337)**	**(0.0263)**	**(0.0317)**	**(0.0324)**
LDiDiD	**0.0118**	**-0.00658**	**0.0302**	**0.0286**	**0.0175**	**0.0392***
	(0.0196)	**(0.0234)**	**(0.0233)**	**(0.0176)**	**(0.0214)**	**(0.0212)**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Triple difference controls	YES	YES	YES	YES	YES	YES
Observations	31,090	22,654	23,650	51,408	37,467	39,074
Number of stocks	207	150	159	207	150	159
Adjusted R^2	0.0142	0.0126	0.0152	0.0116	0.0109	0.0115

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects.

In Table E3, we finally report evidence for the reallocation of trading activity if seasonality effects are considered. In Specification 1 and Specification 2, we still find abnormally high and statistically significant trading volumes of substitute stocks participating in the SLP program in the anticipation period (11.1 percent to 12.3 percent), the short-run treatment period (30.6 percent to 32.0 percent), and the long-run treatment period (22.5 percent to 23.7 percent).

Hence, Table E3 provides strong evidence that the identified reallocations of trading activity in Table 5 of our paper are robust to seasonality effects.

Table E3

Seasonality: Reallocation of Trading Volume

Model	1	2	3	4	5	6
Observation period	2011-2013	2011-2013	2011-2013	2010-2014	2010-2014	2010-2014
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiDiD	**0.125*** **	**0.117*** **	**0.142***	**0.120*** **	**0.107** **	**0.135***
	(0.0461)	**(0.0412)**	**(0.0818)**	**(0.0454)**	**(0.0414)**	**(0.0807)**
SDiDiD	**0.196** **	**0.282*** **	**0.0779**	**0.190** **	**0.271*** **	**0.0695**
	(0.0844)	**(0.0902)**	**(0.132)**	**(0.0840)**	**(0.0905)**	**(0.131)**
LDiDiD	**0.120**	**0.216*** **	**-0.0165**	**0.114**	**0.206*** **	**-0.0242**
	(0.0776)	**(0.0780)**	**(0.115)**	**(0.0771)**	**(0.0780)**	**(0.114)**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Triple difference controls	YES	YES	YES	YES	YES	YES
Observations	110,429	96,474	89,997	171,091	153,053	143,902
Number of stocks	148	129	121	148	129	121
Adjusted R^2	0.922	0.928	0.919	0.913	0.916	0.910

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The variable *TPeriod* is a dummy variable with one in the treatment period after July 31, 2012. *APeriod* is a dummy variable with one during the anticipation period from March 14, 2012, until July 31, 2012. *LTPeriod* (*STperiod*) is a dummy variable with a value of one in the long-run (short-run) treatment period after August 31, 2012 (August 1 until August 31, 2012). *DiD*, *ADiD*, *SDiD*, and *LDiD* are the interaction terms of *TPeriod*, *APeriod*, *STPeriod*, and *LTPeriod*, respectively, with a dummy variable for treated French stocks.

ONLINE APPENDIX F: SHORTER TREATMENT PERIOD

As an additional robustness test, we consider different specifications on the length of our long-run treatment period. Hence, these tests are restricted to Equation (2) of our main paper. First, we test how a shorter long-treatment period of two months (September and October 2012) affects our results. Note that we do not adjust the pre-anticipation period (November 14, 2011, to March 13, 2012), the anticipation period (March 14, 2012, to July 31, 2012), or the short-run treatment period (August 2012).

We report the effects on trading volumes of treated stocks (Models 1 to 3) and substitute stocks (Models 4 to 6) in Table F1. In Models 1 to 3, we still find significant anticipation and short-run treatment effects of a very similar size to our baseline tests (Table 3). However, different from our baseline effects, we find a statistically significant and positive long-run FTT effect on treated SLP stocks, which is not in line with H1b. Potential explanations for this outcome could be reallocating trading activity from treated non-SLP stocks to treated SLP stocks or higher trading frequencies due to the FTT exemption for day trading. However, as we do not have corresponding results for our baseline tests, these findings should be interpreted cautiously.

Table F1

Shorter Treatment Period: Trading Volume

Model	1	2	3	4	5	6
Sample	Treated stocks	Treated stocks	Treated stocks	Substitute stocks	Substitute stocks	Substitute stocks
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.0672***	**0.111*****	**0.0291**	**0.0383**	**0.0904****	**-0.0349**
	(0.0375)	**(0.0360)**	**(0.0497)**	**(0.0476)**	**(0.0385)**	**(0.0860)**
SDiD	**-0.167*****	**-0.0458**	**-0.275*****	**0.141***	**0.255*****	**-0.0204**
	(0.0507)	**(0.0449)**	**(0.0715)**	**(0.0719)**	**(0.0592)**	**(0.133)**
LDiD	**-0.00339**	**0.110****	**-0.103**	**0.0447**	**0.126****	**-0.0688**
	(0.0513)	**(0.0467)**	**(0.0681)**	**(0.0720)**	**(0.0626)**	**(0.130)**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Observations	50,325	36,710	38,373	36,195	31,432	29,521
Number of stocks	207	150	159	148	129	121
Adjusted R^2	0.951	0.932	0.951	0.931	0.937	0.927

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

The findings of our models 4 to 6 in Table F1 confirm our evidence on positive short-run and long-run treatment effects on substitute stocks that participated in the SLP program (reallocation of trading activity, see also Table 5). Hence, we find strong empirical support for H3. Table F2 reports our results for *Daily volatility*, *Weekly volatility*, and *Weekly FOAC* as dependent variables with a long-run treatment period of two months. We widely confirm the baseline results of Table 4. However, we also find evidence for a long-run increase in the *Daily volatility* of treated SLP stocks (Model 2).

Table F2
Shorter Treatment Period: Volatility and First-Order Autocorrelation

Model	1	2	3	4	5	6	7	8	9
Dependent variable	Daily volatility	Daily volatility	Daily volatility	Weekly volatility	Weekly volatility	Weekly volatility	Weekly FOAC	Weekly FOAC	Weekly FOAC
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.00159*** **	**0.00228*** **	**0.000984**	**0.000188**	**0.000698**	**-0.000246**	**-0.0267***	**-0.0460** **	**-0.00924**
	(0.000542)	**(0.000515)**	**(0.000764)**	**(0.000591)**	**(0.000612)**	**(0.000826)**	**(0.0160)**	**(0.0199)**	**(0.0205)**
SDiD	**-0.000258**	**0.000681**	**-0.00109**	**-0.00106**	**-0.000555**	**-0.00149**	**-0.0312**	**-0.0546** **	**-0.0101**
	(0.000714)	**(0.000856)**	**(0.000925)**	**(0.000751)**	**(0.000922)**	**(0.000957)**	**(0.0236)**	**(0.0239)**	**(0.0315)**
LDiD	**0.000547**	**0.00173** **	**-0.000496**	**-0.000764**	**-0.000422**	**-0.00106**	**0.0127**	**0.0143**	**0.0113**
	(0.000749)	**(0.000805)**	**(0.00103)**	**(0.000611)**	**(0.000685)**	**(0.000813)**	**(0.0183)**	**(0.0227)**	**(0.0237)**
Stock FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	50,325	36,710	38,373	10,494	7,647	8,046	10,180	7,447	7,732
Number of stocks	207	150	159	207	150	159	207	150	159
Adjusted R^2	0.304	0.294	0.294	0.253	0.255	0.241	0.000526	0.000856	-0.000293

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses.

ONLINE APPENDIX G: LONGER TREATMENT PERIOD

Augmenting Online Appendix F, we analyze the effect of an extended long-run treatment period of eight months. Thus, the long-run treatment period ranges from September 1, 2012, to April 30, 2013. All other periods (pre-anticipation period, anticipation period, short-run treatment period) remain unchanged. We report the effects on trading volumes of treated stocks (Models 1 to 3) and substitute stocks (Models 4 to 6) in Table G1. We still find significant anticipation and short-run treatment effects of a very similar size to our baseline tests (Table 3). In addition, we do not see any significant long-run impact on treated stocks in Table G1. Models 4 to 6 of Table G1 document our reallocation effects (FTT externalities) for substitute stocks. Again, we find statistically significant and economically large positive effects on substitute stocks participating in the SLP program. The effect size is close to our baseline tests (Table 5).

Table G1
Longer Treatment Period: Trading Volume

Model	1	2	3	4	5	6
Sample	Treated stocks	Treated stocks	Treated stocks	Substitute stocks	Substitute stocks	Substitute stocks
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.0705***	**0.113*****	**0.0335**	**0.0389**	**0.0906****	**-0.0339**
	(0.0373)	**(0.0358)**	**(0.0494)**	**(0.0476)**	**(0.0384)**	**(0.0862)**
SDiD	**-0.164*****	**-0.0441**	**-0.270*****	**0.142***	**0.256*****	**-0.0196**
	(0.0505)	**(0.0448)**	**(0.0712)**	**(0.0719)**	**(0.0593)**	**(0.133)**
LDiD	**-0.0404**	**0.0266**	**-0.0987**	**0.0773**	**0.198*****	**-0.0954**
	(0.0470)	**(0.0448)**	**(0.0619)**	**(0.0618)**	**(0.0660)**	**(0.0847)**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Observations	75,551	55,065	57,647	54,162	47,163	44,160
Number of stocks	207	150	159	148	129	121
Adjusted R^2	0.946	0.927	0.947	0.925	0.933	0.922

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table G2 reports our results for *Daily volatility*, *Weekly volatility*, and *Weekly FOAC* as dependent variables with a long-run treatment period of eight months. We widely confirm the baseline results of Table 4. However, we also find a statistically significant weekly volatility

reduction for all treated and non-SLP stocks. Compared to Table 1, our results suggest an average decrease of *Weekly volatility* by 7.8 percent to 10.5 percent.

Table G2
Longer Treatment Period: Volatility and First-Order Autocorrelation

Model	1	2	3	4	5	6	7	8	9
Dependent variable	Daily volatility	Daily volatility	Daily volatility	Weekly volatility	Weekly volatility	Weekly volatility	Weekly FOAC	Weekly FOAC	Weekly FOAC
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.00159*** **	**0.00228*** **	**0.000992**	**0.000192**	**0.000696**	**-0.000239**	**-0.0265***	**-0.0458****	**-0.00925**
	(0.000542)	**(0.000515)**	**(0.000764)**	**(0.000588)**	**(0.000609)**	**(0.000822)**	**(0.0159)**	**(0.0198)**	**(0.0203)**
SDiD	**-0.000259**	**0.000676**	**-0.00108**	**-0.00105**	**-0.000557**	**-0.00147**	**-0.0312**	**-0.0542****	**-0.0104**
	(0.000712)	**(0.000855)**	**(0.000921)**	**(0.000748)**	**(0.000918)**	**(0.000952)**	**(0.0235)**	**(0.0239)**	**(0.0314)**
LDiD	**-0.000151**	**0.000752**	**-0.000937**	**-0.00115***	**-0.000668**	**-0.00156***	**-0.00451**	**-0.0131**	**0.00313**
	(0.000749)	**(0.000860)**	**(0.00101)**	**(0.000608)**	**(0.000694)**	**(0.000828)**	**(0.0146)**	**(0.0190)**	**(0.0177)**
Stock FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	75,551	55,065	57,647	15,845	11,543	12,149	15,215	11,112	11,567
Number of stocks	207	150	159	207	150	159	207	150	159
Adjusted R^2	0.291	0.288	0.280	0.229	0.233	0.217	0.000567	-0.00117	0.00166

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses.

ONLINE APPENDIX H: ALTERNATIVE OBSERVATION PERIOD

A potential source of concern is the length of our observation period of more than one year. While we provide evidence on a common trend between our treatment group and our control group in the pre-anticipation period ranging from November 14, 2011, to March 13, 2012, there might still be differences in trends and exogenous shocks that affect our results. However, using the months after the official announcement of the French FTT reform in March 2012 as a reference period may also result in inconsistent estimates. It can be subject to anticipation effects or other shocks (most relevant to the French election and the prolongation of the SLP program). As our findings suggest positive anticipation effects for trading volumes of treated stocks and substitute stocks, this indicates an overestimation of the long-run treatment effect of treated stocks and an underestimation of the long-run treatment effect of substitute stocks. Considering this weak point, it might nevertheless be helpful to re-estimate our regressions for a shorter observation period that is more similar to previous approaches of the literature (e.g., Becchetti, Ferrari, and Trenta 2014; Colliard and Hoffmann 2017)

Therefore, we perform additional tests on the short-run and long-run effects of the French FTT reform. In this online appendix, we follow Colliard and Hoffmann (2017) and consider a pre-reform period of two months and a post-reform period of two months. As in the baseline regression, we still consider one month for short-run effects in August 2012. Considering H1a and different from Colliard and Hoffmann (2017), we further include a one-month anticipation period for the last month before the FTT's effective date (July 2012). Hence, we consider the following temporal structure for our alternative tests: a) a pre-anticipation period from May to June 2012, b) an anticipation period in July 2012, c) a short-run treatment period in August 2012, and d) a long-run treatment period from September to October 2012.

In Models 1 to 3, we re-estimate our models on trading volume (H1a, H1b) from Table 2 and the reallocation of trading volume on substitute stocks in Table 5 and report results in

Table H1. Confirming H1a, we still find positive anticipation and adverse short-run treatment effects of a similar size as in Table 2. In addition, we find (statistically weak) evidence for a long-run reduction of trading activity of non-SLP stocks by 10.2 percent.

Models 4 to 6 of Table H1 re-estimate our models concerning the reallocation of trading activity to substitute stocks with a shorter observation period. We still observe positive and statistically significant short-run treatment effects of substitute stocks participating in the SLP program in these models. However, different from Table 5, we do not find long-run treatment effects. In our view, the most likely explanation of the outcome is an underestimation of long-run effects on substitute stocks, as our reference period (May to June 2012) will be partially affected by positive anticipation effects (see also Table 5 for corresponding evidence).

Table H1
Alternative Observation Period: Trading Volume

Model	1	2	3	4	5	6
Sample	French Stocks	French Stocks	French Stocks	Substitute Stocks	Substitute Stocks	Substitute Stocks
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.0706***	**0.0934****	**0.0503**	**0.108****	**0.112****	**0.104**
	(0.0380)	**(0.0369)**	**(0.0512)**	**(0.0478)**	**(0.0493)**	**(0.0785)**
SDiD	**-0.230*****	**-0.176*****	**-0.278*****	**0.129*****	**0.159*****	**0.0865**
	(0.0395)	**(0.0378)**	**(0.0571)**	**(0.0474)**	**(0.0534)**	**(0.0742)**
LDiD	**-0.0653**	**-0.0196**	**-0.106***	**0.0345**	**0.0312**	**0.0388**
	(0.0404)	**(0.0355)**	**(0.0591)**	**(0.0532)**	**(0.0551)**	**(0.0917)**
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Observations	26,404	19,300	20,116	18,983	16,494	15,501
Number of stocks	207	150	159	148	129	121
Adjusted R^2	0.955	0.941	0.955	0.940	0.945	0.938

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table H2 reports our findings for an alternative observation period from May to October 2012 regarding volatility and first-order autocorrelation. While the table confirms our insignificant results for long-run treatment effects of volatility measures (*Daily volatility*, *Monthly volatility*), we find evidence for a long-run increase in *Weekly FOAC,* especially for SLP stocks. This outcome suggests that the French FTT reduced the efficiency of the pricing mechanism for all treated stocks, especially for the treated stocks participating in the SLP

program. While this is partially in line with Colliard and Hoffmann (2017), this outcome should be regarded cautiously. First, neither our baseline results nor our robustness checks do confirm that outcome. Thus, it might be driven by a neglect of anticipation effects or other shocks. Second, this outcome is intuitively not fully convincing. It suggests a predominantly negative impact on the pricing efficiency of the most liquid stocks (SLP stocks).

In contrast, all other tests indicate a weaker effect of the French FTT on SLP stocks. Third, we also tested *Monthly FOAC* as an alternative long-run measure for price efficiency for an alternative (shorter) observation period. Opposite to *Weekly FOAC*, we find a negative and significant long-run effect on *Monthly FOAC*, suggesting an enhancement in price efficiency. We may conclude that the findings for an alternative observation period are not conclusive concerning price efficiency measured by long-run first-order autocorrelation.

Table H2
Alternative Observation Period: Volatility and First-Order Autocorrelation

Model	1	2	3	4	5	6	7	8	9
Dependent variable	Daily volatility	Daily volatility	Daily volatility	Weekly volatility	Weekly volatility	Weekly volatility	Weekly FOAC	Weekly FOAC	Weekly FOAC
Treatment group	All	SLP	Non-SLP	All	SLP	Non-SLP	All	SLP	Non-SLP
ADiD	**0.000416**	**0.000620**	**0.000242**	**0.000313**	**0.00119**	**-0.000442**	**0.0203**	**0.00931**	**0.0307**
	(0.000626)	**(0.000748)**	**(0.000762)**	**(0.000791)**	**(0.00112)**	**(0.000872)**	**(0.0321)**	**(0.0353)**	**(0.0419)**
SDiD	**-0.00186*** **	**-0.00162** **	**-0.00207** **	**-0.000737**	**-0.000273**	**-0.00114**	**0.00727**	**0.00687**	**0.00815**
	(0.000708)	**(0.000810)**	**(0.000964)**	**(0.000744)**	**(0.000881)**	**(0.00101)**	**(0.0269)**	**(0.0308)**	**(0.0333)**
LDiD	**-0.00104**	**-0.000569**	**-0.00145**	**-0.000450**	**-0.000131**	**-0.000727**	**0.0521** **	**0.0755*** **	**0.0315**
	(0.000708)	**(0.000777)**	**(0.001000)**	**(0.000665)**	**(0.000790)**	**(0.000875)**	**(0.0219)**	**(0.0241)**	**(0.0278)**
Stock FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	26,404	19,300	20,116	5,543	4,048	4,247	5,388	3,953	4,092
Number of stocks	207	150	159	207	150	159	207	150	159
Adjusted R^2	0.324	0.311	0.311	0.263	0.274	0.254	0.00653	0.00447	0.00601

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses.

ONLINE APPENDIX I: HETEROGENEITY EFFECTS

Our paper reports regression results that suggest different effects of the French FTT on treated stocks that participate and that do not participate in the SLP program. In addition, we also find heterogeneous results for substitute stocks that participate and that do not participate in the SLP program. However, our paper does not provide empirical tests for significant differences between these different types of stocks. In this online appendix, we perform additional tests to account for that problem. In addition, a potential concern might be that firms participating in the SLP program might be stocks with a larger market capitalization. Thus, SLP participation might proxy for large-cap stocks. In the following, we test if both effects can be separated from each other.

To deal with these issues, we enrich our regression models with indicators of stock heterogeneity. We consider a dummy variable for stocks being part of the SLP program in 2012 (SLP_i) and the logarithm of daily market capitalization in millions of euros (MC_{it}). We interact these variables with our DiD estimators to identify heterogeneous effects for different types of stocks. Considering the heterogeneity indicators H_{it} (either SLP_i or MC_{it}), we rewrite the generalized model as

$$
\begin{aligned}
Y_{it} = {} & \alpha + \beta_1 \cdot ADiD \times H_{it} + \beta_2 \cdot SDiD \times H_{it} + \beta_3 \cdot LDiD \times H_{it} \\
& + \beta_4 \cdot ADiD_{it} + \beta_5 \cdot SDiD_{it} + \beta_6 \cdot LDiD_{it} \\
& + \beta_7 \cdot APeriod \times H_{it} + \beta_8 \cdot STPeriod \times H_{it} + \beta_9 \cdot LTPeriod \times H_{it} \\
& + \beta_{10} \cdot APeriod_t + \beta_{11} \cdot STPeriod_t + \beta_{12} \cdot LTPeriod_t + \beta_{13} \cdot H_{it} + \psi_t + \upsilon_i + u_{it}.
\end{aligned} \tag{I1}
$$

Note that SLP_i is already captured by our stock fixed effects. Thus, it is sufficient to consider MC_{it} as a control for H_{it}. In addition, we account for the interaction terms of both variables with our treatment period variables $APeriod_t$, $STPeriod_t$, and $LTPeriod_t$. We identify the heterogeneity of the causal impact of the FTT reform by the interaction terms $ADiD \times H_{it}$, $SDiD \times H_{it}$, and $LDiD \times H_{it}$. We report our results for the FTT impact on *Trading volume* of treated stocks in Table I1. For the short-run tests in the spirit of Table 3, we replace the

interaction term for the anticipation period *ADiD* (March 14 until July 31, 2012) with an interaction term for the short-run anticipation period *ASDiD* (July 16 to July 31, 2012).

Table I1
Heterogeneity Effects: Trading Volume

Model	1	2	3	4	5	6
Observation Period	Long-run	Long-run	Long-run	Short-run	Short-run	Short-run
ADiD × SLP	**0.102****	**--**	**0.0841**	**--**	**--**	**--**
	(0.0464)	**--**	**(0.0575)**	**--**	**--**	**--**
ASDiD × SLP	**--**	**--**	**--**	**-0.0222**	**--**	**0.00559**
	--	**--**	**--**	**(0.0405)**	**--**	**(0.0489)**
SDiD × SLP	**0.260*****	**--**	**0.181****	**0.0334**	**--**	**-0.0514**
	(0.0705)	**--**	**(0.0740)**	**(0.0431)**	**--**	**(0.0439)**
LDiD × SLP	**0.174*****	**--**	**0.205*****	**--**	**--**	**--**
	(0.0596)	**--**	**(0.0602)**	**--**	**--**	**--**
ADiD × MC	**--**	**0.0358**	**0.0129**	**--**	**--**	**--**
	--	**(0.0269)**	**(0.0304)**	**--**	**--**	**--**
ASDiD × MC	**--**	**--**	**--**	**--**	**-0.0270**	**-0.0285**
	--	**--**	**--**	**--**	**(0.0251)**	**(0.0279)**
SDiD × MC	**--**	**0.0922****	**0.0430**	**--**	**0.0570****	**0.0709*****
	--	**(0.0389)**	**(0.0401)**	**--**	**(0.0231)**	**(0.0237)**
LDiD × MC	**--**	**0.0135**	**-0.0421**	**--**	**--**	**--**
	--	**(0.0342)**	**(0.0325)**	**--**	**--**	**--**
ADiD	0.0181	-0.246	-0.0877	--	--	--
	(0.0500)	(0.239)	(0.252)	--	--	--
ASDiD	--	--	--	0.133***	0.356	0.366
	--	--	--	(0.0435)	(0.230)	(0.243)
SDiD	-0.293***	-0.977***	-0.636*	-0.214***	-0.691***	-0.788***
	(0.0715)	(0.356)	(0.350)	(0.0414)	(0.214)	(0.212)
LDiD	-0.105	-0.149	0.235	--	--	--
	(0.0648)	(0.312)	(0.288)	--	--	--
Triple difference controls	YES	YES	YES	YES	YES	YES
Stock FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Observations	58,579	57,978	57,978	21,948	21,733	21,733
Number of stocks	207	207	207	207	207	207
Adjusted R^2	0.949	0.948	0.948	0.956	0.956	0.956

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

For brevity, we do not report the coefficients of all the interaction terms and *MC* in Equation I1. Instead, we focus on the interaction terms of the heterogeneity parameters with *ADiD, ASDiD* (in the short-run tests), *SDiD,* and *LDiD.* As documented by the positive and significant coefficients of the interaction terms of the DiD dummy variables with *SLP* in Columns 1 to 3, we find robust evidence that the French FTT had a smaller negative effect on stocks participating in the SLP program. This underlines our findings in Table 2 and the results

of Colliard and Hoffmann (2017). That holds even if we control for market capitalization effects by *MC* interaction terms. By contrast, we do not find evidence for significantly different FTT effects on SLP stocks in our short-run tests in Columns 4 to 6 (similar to Table 3 in our paper).

Regarding market capitalization *MC*, we find evidence that treated large-cap stocks had significantly lower short-run reductions of trading activity in August 2012. In our short-run tests, that also holds if we control for SLP effects (Column 6). Altogether, our findings confirm our baseline results.

Table I2
Heterogeneity Effects: Volatility and First-Order Autocorrelation

Model	1	2	3	4	5	6	7	8	9
Dependent variable	Daily volatility	Daily volatility	Daily volatility	Weekly volatility	Weekly volatility	Weekly volatility	Weekly FOAC	Weekly FOAC	Weekly FOAC
ADiD × SLP	**0.00107**		**0.00165***	**0.000340**		**0.00187**	**-0.0281**		**-0.0706****
	(0.000777)		**(0.000950)**	**(0.000899)**		**(0.00136)**	**(0.0250)**		**(0.0333)**
SDiD × SLP	**0.00175**		**0.000719**	**0.000495**		**0.00125**	**-0.0359**		**-0.0449**
	(0.00109)		**(0.00133)**	**(0.00114)**		**(0.00163)**	**(0.0318)**		**(0.0373)**
LDiD × SLP	**0.000380**		**0.00101**	**1.02e-05**		**0.000529**	**-0.0225**		**-0.0316**
	(0.00119)		**(0.00162)**	**(0.000934)**		**(0.00141)**	**(0.0239)**		**(0.0290)**
ADiD × MC		**-8.00e-05**	**-0.000528**		**-0.000405**	**-0.000736**		**0.00595**	**0.0210**
		(0.000370)	**(0.000428)**		**(0.000452)**	**(0.000667)**		**(0.0134)**	**(0.0163)**
SDiD × MC		**0.00187*****	**0.00167****		**0.000483**	**0.000265**		**-0.00616**	**0.00303**
		(0.000603)	**(0.000681)**		**(0.000696)**	**(0.000878)**		**(0.0196)**	**(0.0207)**
LDiD × MC		**0.000517**	**0.000243**		**-0.000161**	**-0.000216**		**0.00236**	**0.0124**
		(0.000701)	**(0.000878)**		**(0.000507)**	**(0.000709)**		**(0.0130)**	**(0.0149)**
ADiD	0.00108	0.00203	0.00513	2.59e-05	0.00354	0.00563	-0.0101	-0.0775	-0.184
	(0.000780)	(0.00329)	(0.00348)	(0.000824)	(0.00388)	(0.00534)	(0.0206)	(0.119)	(0.137)
SDiD	-0.00110	-0.0167***	-0.0154***	-0.00129	-0.00545	-0.00414	-0.0101	0.0231	-0.0363
	(0.000944)	(0.00532)	(0.00569)	(0.000965)	(0.00594)	(0.00713)	(0.0321)	(0.174)	(0.175)
LDiD	0.000308	-0.00426	-0.00237	-0.000814	0.000336	0.000587	0.0163	-0.0161	-0.0920
	(0.00104)	(0.00605)	(0.00706)	(0.000828)	(0.00444)	(0.00579)	(0.0191)	(0.115)	(0.125)
Triple difference controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Stock FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	58,579	57,978	57,978	12,291	12,137	2,855	11,757	11,663	2,840
Number of stocks	207	207	207	207	207	207	207	207	207
Adjusted R^2	0.332	0.334	0.334	0.283	0.285	0.629	0.0166	0.0164	0.0765

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses.

Table I2 reports regression results for our heterogeneity tests with *Daily volatility*, *Weekly volatility*, and *Weekly FOAC* as dependent variables. The evidence in these regressions is somewhat inconclusive. For *Daily volatility*, we find evidence for weaker short-run treatment effects for large-cap stocks (*SDiD × MC*). We also find some evidence for lower *Weekly FOAC*

in the anticipation period in the case of treated SLP stocks. Altogether, Table I2 does not provide clear evidence for heterogeneity effects.

Table I3 reports regression results of our heterogeneity tests for the reallocation of *Trading volume* to substitute stocks. Confirming our baseline results, we find strong evidence that positive FTT effects on trading volumes of substitute stocks were concentrated on the substitute stocks that participated in the SLP program. Thus, we find statistically significant and economically large interaction effects of *ADiD*, *SDiD,* and *LDiD* with the *SLP* dummy variable. By contrast, we do not find additional significant interaction effects for large-cap stocks (*MC*) if we control for SLP effects (see Model 3 of Table E3). We do not find much evidence for heterogeneity effects in our short-run tests (Models 4 to 6).

Table I3

Heterogeneity Effects: Reallocation of Trading Volume

Model	1	2	3	4	5	6
Observation Period	Long-run	Long-run	Long-run	Short-run	Short-run	Short-run
ADiD × SLP	**0.262*** **		**0.297*** **	**--**	**--**	**--**
	(0.0664)		**(0.112)**	**--**	**--**	**--**
ASDiD × SLP	**--**	**--**	**--**	**0.0131**		**0.0938**
	--	**--**	**--**	**(0.0626)**		**(0.109)**
SDiD × SLP	**0.503*** **		**0.636*** **	**0.106**		**0.266*** **
	(0.102)		**(0.166)**	**(0.0683)**		**(0.102)**
LDiD × SLP	**0.345*** **		**0.436*** **	**--**	**--**	**--**
	(0.0944)		**(0.152)**	**--**	**--**	**--**
ADiD × MC	**--**	**0.0574***	**-0.0209**	**--**	**--**	**--**
	--	**(0.0315)**	**(0.0452)**	**--**	**--**	**--**
ASDiD × MC	**--**	**--**	**--**	**--**	**-0.0111**	**-0.0356**
	--	**--**	**--**	**--**	**(0.0273)**	**(0.0404)**
SDiD × MC	**--**	**0.0762***	**-0.0922**		**0.00288**	**-0.0669**
	--	**(0.0439)**	**(0.0605)**		**(0.0286)**	**(0.0411)**
LDiD × MC	**--**	**0.0516**	**-0.0634**	**--**	**--**	**--**
	--	**(0.0409)**	**(0.0560)**	**--**	**--**	**--**
ADiD	-0.186***	-0.492*	-0.0335	--	--	--
	(0.0692)	(0.267)	(0.331)	--	--	--
ASDiD	--	--	--	0.101*	0.191	0.337
	--	--	--	(0.0556)	(0.235)	(0.295)
SDiD	-0.273***	-0.580	0.403	0.00120	0.0230	0.433
	(0.0979)	(0.373)	(0.443)	(0.0588)	(0.238)	(0.296)
LDiD	-0.197**	-0.397	0.280	--	--	--
	(0.0882)	(0.342)	(0.407)	--	--	--
Triple difference controls	YES	YES	YES	YES	YES	YES
Stock fixed effects	YES	YES	YES	YES	YES	YES
Month fixed effects	YES	YES	YES	YES	YES	YES
Observations	50,052	49,382	49,382	18,714	18,467	18,467
Number of stocks	148	148	148	148	148	148
Adjusted R^2	0.925	0.924	0.924	0.938	0.938	0.938

Notes: The dependent variable is the logarithm of the number of traded shares (in thousands). We calculate estimates by OLS with stock and month fixed effects. Heteroscedasticity-robust standard errors are clustered by stock level and documented in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

ONLINE APPENDIX J: ADDITIONAL DESCRIPTIVE STATISTICS

This online appendix provides detailed information on the descriptive statistics of the SLP and non-SLP stocks that we document in Table J1. The table reveals that SLP stocks have higher trading volumes than non-SLP stocks. Regards the treated French stocks, we also find higher volume-to-market ratios for SLP stocks. SLP stocks are also more extensive in terms of market capitalization and EBITDA.

Table J1
Descriptive Statistics: SLP and non-SLP stocks

Panel A: SLP stocks						
Group	Treated stocks			Substitute stocks		
Observations	13,920			7,794		
Stocks	48			27		
Variable	Mean	Median	Standard deviation	Mean	Median	Standard deviation
Trading volume (1,000 trades)	2,543.08	928.45	6,335.87	3,557.44	1,188.05	6,542.81.77
Price-adjusted volume (million €)	47.45	31.45	49.50	42.18	21.83	51.98
Volume-to market ratio (%)	0.43	0.31	0.43	0.45	0.37	0.45
Daily return (%)	0.06	0.04	2.06	0.68	0.04	42.51
Share price (€)	42.59	33.70	30.97	29.58	26.10	30.40
Relative intraday volatility (%)	2.56	2.20	1.44	2.49	2.11	1.54
Relative weekly volatility (%)	1.51	1.23	1.10	1.64	1.28	2.18
Relative monthly volatility (%)	2.99	2.49	1.94	3.32	2.75	2.81
Weekly first-order autocorrelation (%)	39.74	33.72	35.56	40.64	32.76	35.85
Monthly first-order autocorrelation (%)	18.53	15.80	13.53	20.04	18.11	13.95
Market capitalization (million €)	16,701.79	8,804.97	19,743.08	13,231.72	6,490.84	19,542.54
Market-to-book ratio (%)	169.70	137.00	116.91	203.13	165.00	139.17
EBITDA (1000s €)	3,722.14	203.00	5,593.17	3,661.36	893.00	9,482.44
Panel B: Non-SLP stocks						
Group	Treated stocks			Substitute stocks		
Observations	15,865			13,464		
Stocks	57			46		
Variable	Mean	Median	Standard deviation	Mean	Median	Standard deviation
Trading volume (1,000 trades)	774.05	77.50	2,728.39	293.07	90.70	774.33
Price-adjusted volume (million €)	11.25	2.82	37.17	2.05	1.13	3.39
Volume-to market ratio (%)	0.16	0.10	0.22	0.43	0.20	1.10
Daily return (%)	0.06	0.00	2.03	0.31	0.00	8.84
Share price (€)	62.80	37.22	88.82	17.77	13.51	17.35
Relative intraday volatility (%)	2.53	2.17	1.59	3.26	2.67	2.39
Relative weekly volatility (%)	1.45	1.14	1.11	1.98	1.46	2.28
Relative monthly volatility (%)	3.00	2.54	1.89	4.21	3.24	3.48
Weekly first-order autocorrelation (%)	40.25	32.87	37.72	39.34	32.28	37.82
Monthly first-order autocorrelation (%)	17.82	15.23	13.25	18.94	16.88	13.78
Market capitalization (million €)	4,757.78	2,753.84	6,876.52	660.85	524.55	476.21
Market-to-book ratio (%)	141.14	118.00	168.83	339.64	121.00	218.57
EBITDA (1000s €)	1,277.78	460.22	2,472.66	107.21	101.00	275.14

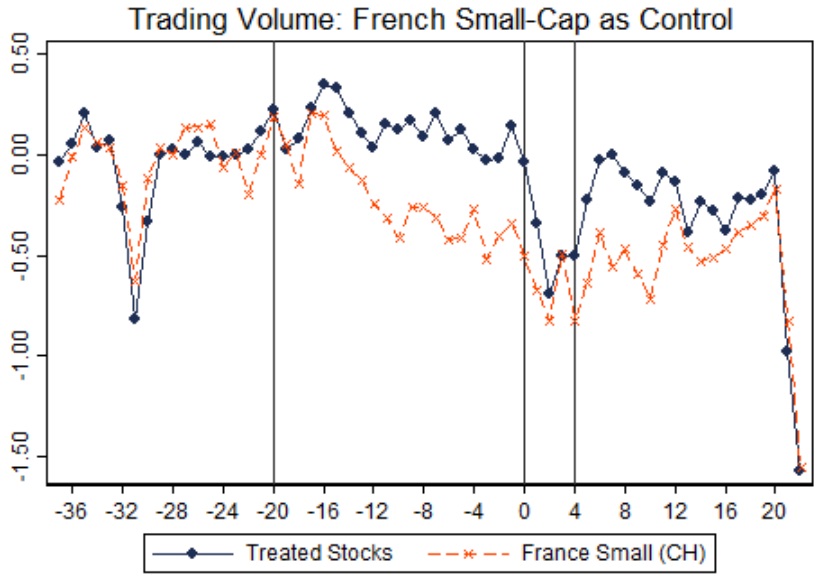
Notes: The number of observations is smaller for relative weekly and monthly volatilities and weekly and monthly first-order autocorrelations.

While daily volatility seems to be larger for non-SLP stocks, there is no clear association of the SLP participation with long-term volatility or first-order autocorrelation (especially for the treated stocks). We do not find robust and consistent differences between SLP and non-SLP stocks regarding market-to-book ratios and daily returns.

ONLINE APPENDIX K: ADDITIONAL GRAPHICAL ANALYSES

A potential concern might be if a control group of French small-cap stocks below a market capitalization of €1 billion might be better suited as a control group than our selected control group. Therefore, we provide an analysis of the co-movement of *Trading volume* between French small-cap stocks that are used as part of our group of substitute stocks with our treated French stocks. We document the visual evidence on this co-movement in Figure K1 and find visual evidence for a weaker co-movement for the treated French stocks with untreated French small-cap stocks.

Figure K1



Another concern might be the normalization procedure of our graphical analysis in our main paper (Section IV, Subsection C). In this exercise, we normalize the values of our observables in trading with their average value in the pre-anticipation period before March 14, 2012 (apart from days with unusual trading volumes over Christmas and New Year's Eve). One might be afraid that using data from the anticipation period for normalization generates the impression of a common trend before the announcement of the FTT reform. Therefore, we use an alternative normalization scheme and normalize all values with average over the whole observation period (apart from Christmas and New Year's Eve to exclude outliers from the normalization procedure).

We present our corresponding results below in Figures K2 and K3. It turns out that changing the temporal reference point of normalization does not lead to different conclusions. Still, we find a common trend in the pre-anticipation period for all observed variables. In addition, we observe abnormally high trading volumes of treated stocks in the anticipation period and the short-run treatment period but not in the long-run treatment period (Figure K2). We further find some indication for abnormally high *Daily volatility* and abnormally high *Weekly volatility* of the treated French stocks in the anticipation period but not in the long run.

When comparing common trends between the group of substitute and control stocks, we find evidence for a common trend in the pre-anticipation period again. Furthermore, for the substitute stocks participating in the SLP stocks, we see higher trading volumes after the announcement of the French FTT, i.e., the anticipation period, the short-run treatment period, and the long-run treatment period. The visual evidence is especially strong close to the effective date of the French FTT reform. This suggests that the French FTT resulted in a reallocation of trading activity to the SLP substitute stocks resulting in a positive externality for other stocks.

Figure K2
UK and German Large-cap stocks versus French treated stock (normalization 1)

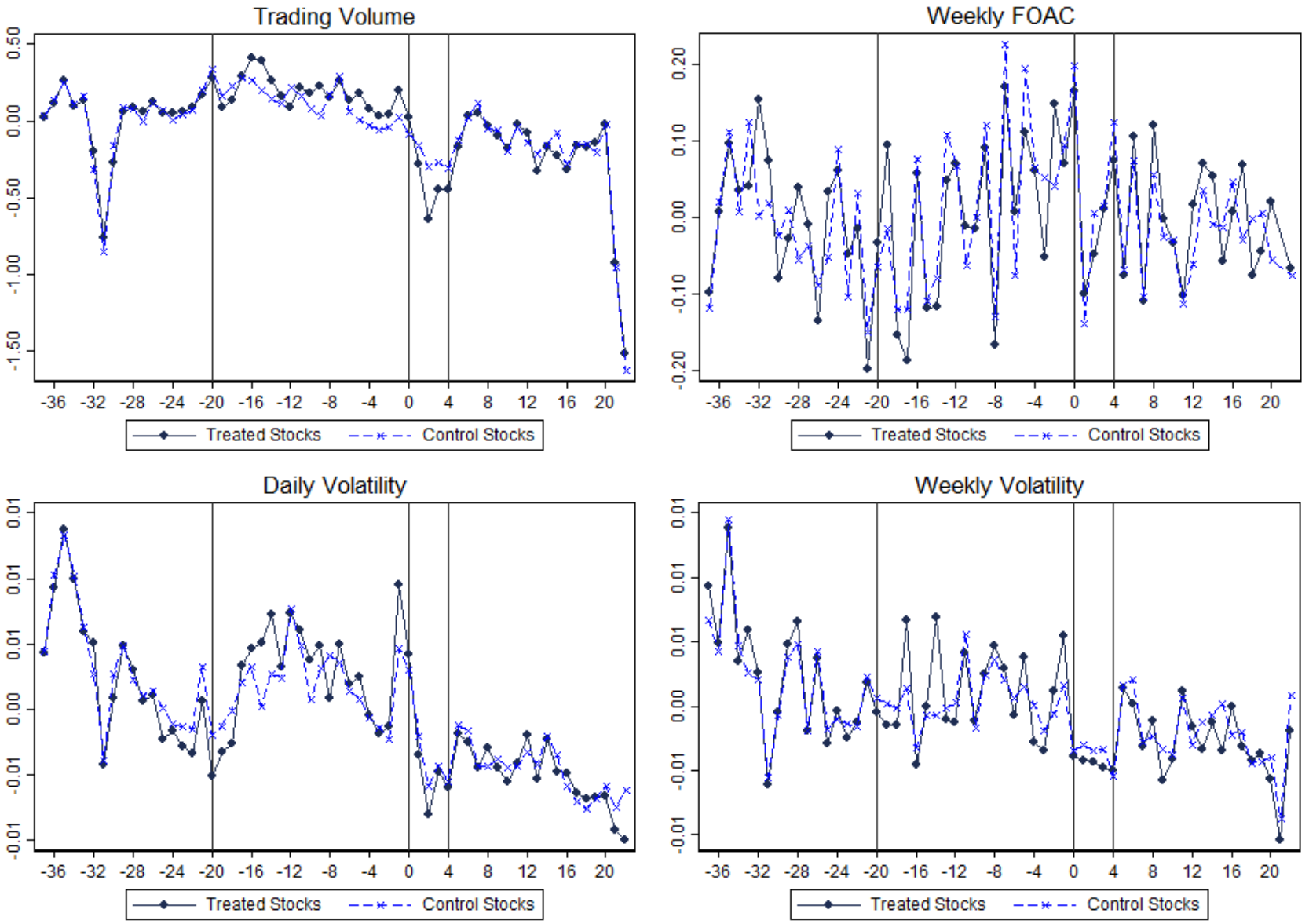
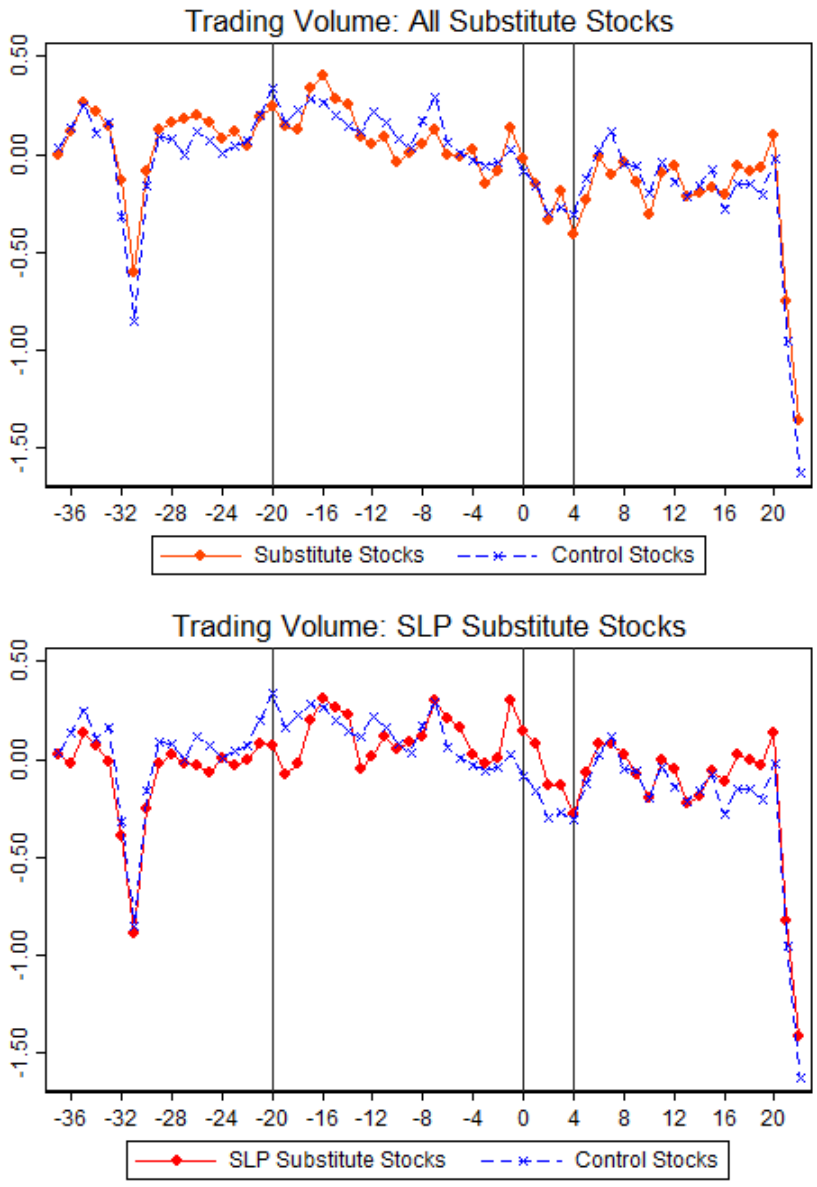


Figure K3
Reallocation of Trading Activity



Note: Week -20 indicates the announcement date (March 14, 2012) and week 0 the introduction date (August 1, 2012). The period between these dates is the anticipation period. The period from week 0 to week 4 is the short-run treatment period and the time span from week 4 onward is the long-run treatment period.

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