Inflation and Individual Investors' Behavior: Evidence from the German Hyperinflation*

Fabio Braggion†, Felix von Meyerinck‡, Nic Schaub§

February 16, 2022

Abstract

We analyze how individual investors respond to inflation. We introduce a unique dataset containing information on local inflation and security portfolios of more than 2,000 clients of a German bank between 1920 and 1924, covering the German hyperinflation. We find that individual investors buy less (sell more) stocks when facing higher local inflation. This effect is more pronounced for less sophisticated investors. Moreover, we document a positive relation between local inflation and forgone returns following stock sales. Our findings are consistent with individual investors suffering from money illusion. Alternative explanations such as consumption needs are unlikely to drive our results.

Keywords: inflation, investor behavior, individual investors, behavioral biases, money illusion
JEL Classifications: D14, E31, G11, G41, N14

*We would like to thank an anonymous bank for providing the data. We are grateful to Rainer Baule, Martin Brown, Carsten Burhop, Constantin Charles, Ralf Fendel, Alexander Hillert, Peter Koudijs, Lyndon Moore, Theo Nijman, Larissa Schäfer, Andrew Sinclair, Oliver Spalt, Michael Weber, conference participants at the 2021 annual meeting of the Swiss Society for Financial Market Research (SGF), the 2021 Swiss Winter Conference on Financial Intermediation, the 6th European Retail Investment Conference (ERIC), the 2021 SFS Cavalcade North America, the 27th annual meeting of the German Finance Association (DGF), the 3rd European Macrohistory Workshop, the 2022 European Winter Finance Conference (EWFC), and seminar participants at the Finance and History Workshop, the Quantitative History Webinar Series, the CEPR International Macro History Online Seminar, the University of St. Gallen, Tilburg University, the EUR-Economic History Group, the Dutch National Bank, Goethe University Frankfurt, the University of Bristol, and Peking University HSBC Business School for helpful comments. Nicolas Bopp, Ellen Hazeleger, Nicolai Stübiger, Nikolaus Veith, and Alena Willi provided excellent research assistance. Financial support from the Basic Research Fund of the University of St. Gallen and Inquire Europe is gratefully acknowledged. The authors do not have any conflicts of interest to disclose.

†Tilburg University, NL-5000 LE Tilburg, The Netherlands, f.braggion@tilburguniversity.edu, +31 13-466-8209. Braggion is a CEPR fellow and an ECGI member.

‡Tilburg University, NL-5000 LE Tilburg, The Netherlands, f.h.r.vonmeyerinck@tilburguniversity.edu, +31 13-466-2392.

§WHU – Otto Beisheim School of Management, D-56179 Vallendar, Germany, nic.schaub@whu.edu, +49 261-6509-817.

1 Introduction

Inflation is among the most important economic risks faced by individual investors. Following the outbreak of the COVID-19 pandemic, inflation resurfaced in many countries.[1] Even though individual investors play an increasingly important role in capital markets, little is known about how they respond to the prospect of higher inflation, and theory provides conflicting hypotheses on this question.[2] On the one hand, the hedging hypothesis predicts that investors are *more likely to buy and less likely to sell stocks* when expected inflation increases. This is because investors understand that stocks entitle them to a fraction of the income generated by the underlying real assets, allowing them to preserve the real value of their investments (e.g., Fama and Schwert, 1977; Fama, 1981; Boudoukh and Richardson, 1993; Bekaert and Wang, 2010). On the other hand, the money illusion hypothesis suggests that investors are *less likely to buy and more likely to sell stocks* in periods of higher expected inflation. This is because they adjust nominal interest rates but ignore that firms' cash flows also grow with inflation, leading them to require higher dividend yields to hold stocks (e.g., Modigliani and Cohn, 1979; Ritter and Warr, 2002; Cohen et al., 2005). Given these two competing hypotheses, understanding how investors react to expected inflation is an empirical question.

A test of individual investors' response to inflation is subject to three main empirical challenges. First, one needs granular data on investors' security transactions. This allows for a direct analysis of investment decision-making in inflationary periods. Second, one needs a time period in which inflation, if overlooked, produces sizable financial losses and thus attracts the attention of investors.[3] Third, one needs a reliable measure of expected inflation that varies both over time and across investors. This is a necessary condition for a within-person analysis and enables one to control for the overall time trend.

[1] See, e.g., "Eurozone inflation rises to 5 percent, yet another record", *New York Times*, January 7, 2022; "Inflation in rich economies surges to a 25-year high", *Financial Times*, January 11, 2022; "U.S. inflation hit 7% in December, fastest pace since 1982", *Wall Street Journal*, January 12, 2022.

[2] See, e.g., "Everyone's a day trader now", *Wall Street Journal*, July 25, 2020; "Individual-investor boom reshapes U.S. stock market", *Wall Street Journal*, August 31, 2020; "Rise of the retail army: the amateur traders transforming markets", *Financial Times*, March 9, 2021.

[3] In periods of low inflation, investors may not react to inflation because of rational inattention (e.g., Mankiw and Reis, 2002; Sims, 2003; Katz et al., 2017).

This setup is not available in the most common investor-level datasets. In this paper, we therefore introduce a unique dataset containing security portfolios of over 2,000 private clients of a German bank between 1920 and 1924, the period of the German hyperinflation. The data and the time period are ideally suited to address each of the empirical challenges outlined above. First, we have detailed information on every trade executed by the bank's clients, allowing for a direct analysis of individuals' investment behavior. Second, between January 1920 to September 1923, inflation was high, potentially yielding large financial losses if overlooked, and arguably grabbing investors' attention. Third, we have inflation data at the monthly level for hundreds of towns in Germany, resulting in an inflation measure that captures inflation experienced locally over time, which should be a reliable proxy for expected inflation.[4]

Figure 1 visualizes our main finding. Each month, we sort towns in Germany into deciles based on their local inflation and compute, for each inflation decile, the average buy-sell imbalance for stock trades of clients living in those towns. We then plot average buy-sell imbalances against inflation deciles. The figure shows a strong negative relationship between inflation deciles and investors' buy-sell imbalances. This suggests that investors buy less (sell more) stocks when facing higher local inflation. Moving from the decile with the lowest inflation to the decile with the highest inflation reduces buy-sell imbalances by 17 percentage points.[5] This result is consistent with the money illusion hypothesis, but inconsistent with the hedging hypothesis.

In a more formal analysis, we regress investors' buy-sell imbalances in stock trades on local inflation, including town-level controls, time fixed effects, and client fixed effects. We find that a 1% increase in local inflation is associated with a significant decline in the buy-sell imbalance for stocks of 3.5%. This regression analysis therefore confirms the negative slope across the bars observed in Figure 1.

We also analyze a reverse inflation shock. In particular, we investigate individual in-

[4]Existing empirical work shows that the inflation experienced personally is a crucial determinant of individuals' inflation expectations (e.g., Malmendier and Nagel, 2016; D'Acunto et al., 2021).

[5]Many companies issued new equity during our sample period, providing an explanation for why buy-sell imbalances are positive on average. This was driven by firms' capital needs following the war (e.g., Aron, 1927; Bresciani-Turroni, 1937, p. 255).

vestors' behavior around October 1923, when the German government successfully reformed its currency. As inflation declined close to zero within weeks, nominal and real discount rates converged. Hence, we expect that investors subject to money illusion no longer make a valuation error and increase their demand for stocks after the reform. The effect should be greater for clients who experienced higher inflation right before the reform as they made greater errors. Indeed, we find that investors who experienced high local inflation prior to the reform invest more in stocks after the reform compared to investors who experienced low local inflation prior to the reform. Similarly, investors living in Germany (who experienced high inflation prior to the reform) invest more in stocks after the reform compared to investors living abroad (who experienced low inflation).

Next, we analyze the heterogeneity in the relation between local inflation and stock trades. Existing research shows that sophisticated investors are less prone to behavioral biases (e.g., Feng and Seasholes, 2005; Locke and Mann, 2005; Grinblatt et al., 2016). Thus, we test whether sophistication reduces the documented effect. First, following prior studies and anecdotal evidence, we use clients' portfolio value, clients' portfolio diversification, clients' employment with the bank, and clients' use of margin loans as proxies for sophistication (e.g., Bresciani-Turroni, 1937; Feng and Seasholes, 2005; Locke and Mann, 2005; Hirshleifer et al., 2008; Barber et al., 2016). We find the negative relationship between local inflation and buy-sell imbalances for stocks to be attenuated for more sophisticated clients. Second, we analyze stock trades executed by institutional clients of our bank. We find the association between local inflation and buy-sell imbalances for stocks to be positive and weakly significant. This suggests that institutional investors do not suffer from money illusion. Overall, these findings support the notion that sophistication reduces money illusion.

According to Modigliani and Cohn (1979), investors subject to money illusion make a second valuation error in inflationary periods. They do not understand that decreasing accounting profits of firms caused by higher nominal interest payments are offset by the depreciation of the real value of nominal liabilities. Thus, investors subject to money illusion reduce their demand for stocks of firms that issue new debt. In line with this second form of money illusion, we show that the buy-sell imbalance for stock trades is lower for firms with greater increases in nominal liabilities when inflation rises at the firms' headquarters.

We then examine the relation between local inflation and the performance of stock sales. Investors subject to money illusion are more likely to sell stocks in inflationary periods because they perceive them to be overvalued. If these stocks were truly overvalued, we should observe negative real returns following inflation-induced stock sales. However, we find a positive relation between local inflation and foregone real returns following stock sales. This evidence is again consistent with investors committing an inflation-induced valuation error.

While our findings provide support for the money illusion hypothesis, we also test for several competing explanations. First, as argued by Fama (1981), it could be that inflation proxies for economic prospects. Hence, if local inflation increases, investors might lower their cash flow expectations, thus reducing their demand for stocks. To rule out this explanation, we replicate our main test for the first part of the sample period, when inflation was lower and the prospects for the German economy were good. We find results similar to those in our main analysis. Second, we rerun our main test at the client-stock-month level (rather than at the client-month level), which allows us to include security-month fixed effects. Security-month fixed effects control for time-varying security characteristics, such as changes in cash flows. We again document a strong negative association between local inflation and buy-sell imbalances for stocks. Third, we examine investors' behavior around the release of bad economic and political news in Germany, which likely affected investors' expectations about economic prospects (e.g., Bittlingmayer, 1998). However, we do not find any evidence for a change in investors' behavior around these events. This suggests that changes in economic prospects of firms are not driving our main results.

Inflation could also make individuals more risk averse, thus explaining the negative relationship between local inflation and buy-sell imbalances for stocks (e.g., Brandt and Wang, 2003; Cohen et al., 2005). However, the release of bad news mentioned above most likely affected not only investors' expectations about economic growth, but also their risk aversion. Since we do not find any evidence for a change in investors' behavior around the release of bad news, it is unlikely that risk aversion explains our results. In an additional test, we replicate our main analysis separately for low-volatility stocks and high-volatility stocks. If risk aversion were driving our findings, we would expect the relation between local inflation and buy-sell imbalances to be stronger for high-volatility stocks. However, results are very similar across the two groups of stocks, again suggesting that risk aversion is not a likely explanation for our findings.

Our results could also be driven by investors liquidating stocks to buy consumption goods, which become more expensive as local prices rise. If this were the case, we would expect clients to not only reduce their demand for stocks, but their demand for securities in general, and bonds in particular. This is because bonds are an inferior hedge against (unexpected) inflation compared to stocks. However, we find a positive relation between local inflation and buy-sell imbalances for bonds, indicating that clients buy more (sell less) bonds when facing higher local inflation. This pattern does not support the idea that investors reduce their demand for stocks to finance consumption in times of rising prices. Rather, it indicates that clients tend to reallocate funds from stocks to bonds. In an additional test, we examine investors' behavior in months in which they receive dividend payments from their stock holdings. In these months, the pressure to liquidate stocks to meet consumption needs should be alleviated. However, we do not find any evidence that the negative relation between local inflation and buy-sell imbalances for stocks is less pronounced in months with dividend payments, again suggesting that consumption needs are unlikely to drive our results.

The negative relation between local inflation and buy-sell imbalances for stocks could also be due to investors using other asset classes to hedge against inflation, for instance foreign exchange or real estate. We first evaluate potential investments in foreign exchange. The German authorities had already curbed investments in foreign exchange during the First World War and, in 1922, the government passed a law that *de facto* forbade transactions in foreign currencies. Consistent with the notion that foreign exchange was not a viable alternative to hedge against inflation, we do not find any relation between local inflation and transactions in securities denominated in foreign currencies. Moreover, we do not find a change in investors' behavior when Germany outlawed trading in foreign securities in 1922. Next, we evaluate potential investments in real estate. Because rents were fixed by law, they only covered a small fraction of the maintenance costs as prices rose. This resulted in selling pressure and negative real returns, rendering real estate investments unsuitable as protection against inflation. We also do not find a change in investors' behavior when German authorities deregulated the housing market and made investments in real estate more attractive. These tests suggest that it is unlikely that our main results are driven by clients shifting their investments from stocks into other asset classes to hedge against inflation.

Finally, we run instrumental variables regressions to address the concern that local inflation may be correlated with unobservable determinants of stockholdings not captured by our controls and other tests. A unique characteristic of our sample period is that money needed to be printed before brought into circulation. A large fraction of bank notes was printed and brought into circulation locally. Thus, we instrument local inflation with the local availability of raw paper used to produce bank notes. We first show that the local availability of paper, proxied by the fraction of local employees in the paper industry at the beginning of our sample period, is significantly and positively correlated with local inflation. As the location of the paper industry was primarily determined by environmental factors, namely the local availability of spruce trees and clean river water, the variation in inflation that we exploit in these tests can reasonably assumed to be exogenous. When we replicate our main analysis with instrumented local inflation, we continue to find that investors buy less (sell more) stocks when facing higher local inflation. This lends support to a causal interpretation of the documented effect.

Our paper makes three contributions. First, we contribute to the empirical literature on investors' response to inflation. Existing work in this area focuses mostly on the relation between inflation and stock price changes. Lending support to the hedging hypothesis, some papers find inflation to be positively correlated with stock returns (e.g., Branch, 1974; Firth, 1979; Boudoukh and Richardson, 1993). However, numerous studies also document a negative association between inflation and stock returns (e.g., Fama and Schwert, 1977; Fama, 1981; Bekaert and Wang, 2010). Some articles rely on money illusion to explain this negative relation (e.g., Ritter and Warr, 2002; Cohen et al., 2005), while others have identified rational explanations. For instance, according to Fama (1981), the negative relationship between inflation and stock returns is due to higher expected inflation proxying for lower expected economic growth. Our approach is different from the approach of the existing literature. Rather than analyzing stock returns, which only provide *indirect* evidence of investors' behavior, we study investors' security transactions. This enables us to provide the first *direct* evidence of investors' response to inflation. Our findings lend support to the money illusion hypothesis.

Second, we contribute to the literature on individual investor behavior. Extant studies show that individual investors are subject to various behavioral biases.[6] To the best of our knowledge, we are the first to investigate individual investors' response to inflation. We provide evidence that individual investors reduce their demand for stocks during inflationary periods, consistent with money illusion.

Third, we contribute to the literature on hyperinflations. Existing research mainly studies hyperinflations to understand how individuals form inflation expectations and how these expectations affect their demand for money (e.g., Cagan, 1956; Frenkel, 1977; Evans, 1978; Salemi and Sargent, 1979). However, little is known about individual investors' decisions during hyperinflations. Our study fills this gap.

Our results stress the importance of the ongoing debate on the financial literacy of individuals. Recently, the European Commission pointed towards the limited financial literacy of households and advocated for making financial education a priority for Europe. Similar calls were made in the U.S.[7] Our results underscore concerns that the financial literacy of individuals may not be sufficient to respond appropriately to the currently resurfacing inflation.

The remainder of the paper is organized as follows. In the next section, we provide the historical background. Section 3 explains the money illusion hypothesis of Modigliani and Cohn (1979) in greater detail. In Section 4, we describe our empirical approach. Section 5 introduces our data. In Section 6, we test the first and the second proposition of Modigliani and Cohn (1979). We then analyze the performance following stocks sales. Finally, we run a large number of additional tests to rule out alternative explanations. Section 7 concludes.

[6]Barber and Odean (2013) provide a review of the literature on individual investors' behavior.

[7]See, e.g., "'We need people to know the ABC of finance': facing up to the financial literacy crisis"; *Financial Times*, October 4, 2021; "Education Secretary Miguel Cardona says personal finance lessons should start as early as possible", *CNBC*, October 13, 2021; "Improving financial literacy must be a priority for Europe", *Financial Times*, January 17, 2022.

2 Historical background

2.1 The German hyperinflation

The origins of the German hyperinflation lie in the economic and political situation that characterized the First World War and its aftermath. At the onset of the war in 1914, the German government suspended the convertibility between the *Mark* and gold and switched to a fiat money system. The war effort was predominantly financed by domestic debt and newly printed money. As a result, when Germany surrendered in November 1918, the national consumer price index (CPI) had increased by more than 100% compared to the beginning of the war (e.g., Bresciani-Turroni, 1937, pp. 23-28; Dalio, 2018, pp. 7-11).

After the First World War, the newborn German republic needed to finance post-war reconstruction, current expenditures, and war reparations. However, tax revenues were low and Germany lacked the political and administrative strength to cut spending or to impose new taxes. Uncertainty about tax collection also impaired the possibility to issue new debt to German citizens. The international debt market remained inaccessible as international investors had no confidence in the *Mark* and questioned Germany's creditworthiness. Therefore, printing money increasingly became the way to meet financial obligations. Between the end of the war and the beginning of 1920, the price level had increased by a factor of four (e.g., Moulton and McGuire, 1923, pp. 201-207; Bresciani-Turroni, 1937, p. 30).

In 1920, both the internal price level and the exchange rates of the *Mark* to foreign currencies stabilized. The expansionary monetary policy of the German Central Bank (*Reichsbank*) made German exports more attractive and increased the demand for *Mark* as foreign consumers looked for the German currency to purchase German goods (e.g., Dalio, 2018, pp. 16-19). Figure 2 shows the CPI for Germany from February 1920 onwards. The average monthly national inflation rate between March 1920 and April 1921 was about 2.2%.

The London Ultimatum in May 1921 again worsened Germany's financial situation and the trust in the *Mark*. The Reparation Commission, established under the Peace Treaty of Versailles to work out the long-term reparation claims, demanded reparations totaling 132 billion *Mark*. This represented an increase in government debt of around 330% of GDP (e.g., Dalio, 2018, pp. 20-22). From May to December 1921, the average monthly national inflation rate was about 7.1% (see Figure 2).

At the beginning of 1922, optimism spread as the Allies acknowledged that the reparation demands were unsustainable. However, when renegotiations failed in June, the *Mark* fell (e.g., Dalio, 2018, pp. 26-32). The average monthly inflation rate was 13.7% in the first half of 1922 and 61.2% in the second half (see Figure 2).

In January 1923, France and Belgium invaded Germany's industrial heartland, the Ruhr area, after the Reparation Commission unanimously found that Germany had defaulted on reparation payments. The consequences of the occupation were a government-financed general strike in the Ruhr area and the need to import coal for the rest of Germany, which further burdened the state's budget. By March 1923, inflation had spun out of control. In October 1923, the *Mark* stood at six billion-to-one relative to its pre-war value (e.g., Bresciani-Turroni, 1937, p. 36; Dalio, 2018, pp. 33-34).

In mid-October 1923, the government introduced a stabilization policy that stopped the hyperinflation. The main element of the policy was the introduction of a new currency, the *Rentenmark*, which was backed by gold as well as German land and was pegged to the dollar. Strict limits were placed on the amount of *Rentenmark* that could be printed. Stabilization also came with fiscal consolidation and renewed renegotiations with the Allies over reparation demands, which led to substantially reduced reparation claims and culminated in the Dawes Plan (e.g., Bresciani-Turroni, 1937, p. 98; Dornbusch, 1985; Dalio, 2018, pp. 35-42).

2.2 Financial investments in Germany, 1920-1924

Between 1920 and 1924, stocks and bonds were traded on about 20 different exchanges in Germany. Berlin was the country's largest exchange (e.g., Ferguson and Voth, 2008; Lehmann-Hasemeyer and Streb, 2016) and the second largest exchange in the world (after London) in terms of number of stocks traded (e.g., Moore, 2012). The investment universe in Berlin comprised over 4,000 securities issued by about 2,000 different entities. The majority were fixed income securities (around 60%), while the remaining were equity securities.[8] Most issuers were companies, in particular manufacturing firms, iron and steel works, as well as railroads. In order to conduct a trade, investors commissioned a broker, often by phone, who traded on their behalf and was awarded a fee for the service. Trading was possible six days a week (all days but Sundays). For most securities, supply and demand were matched by the dedicated market makers in one auction per day, resulting in one market price at which all trades were executed (e.g., Buchwald, 1924, pp. 233-236).

Another potential investment was foreign exchange. However, to finance the war effort, between 1914 and 1918 German citizens had to surrender to the government all foreign exchange they owned, in exchange for paper marks. After the war, the Treaty of Versailles stated that all of Germans' foreign assets were expropriated, including financial securities issued by private and public entities in the Allied countries. Moreover, during the 1920s, the German authorities introduced even more rigorous rules that prevented investors from owning and purchasing foreign exchange.[9] As a result, there was little ownership in foreign exchange and purchasing foreign exchange was difficult during our sample period.

Another asset class to potentially invest in was real estate. However, since the outbreak of the war, rents were fixed to preserve social peace (so-called *Friedensmiete* or "peace rent"). Fixed rents disincentivize individuals to become landlords, even more so in a high-inflation environment. As prices increased, rents covered an ever-shrinking fraction of the maintenance costs, forcing many landlords to sell (Bresciani-Turroni, 1937 p. 299). In the course of the hyperinflation, many houses were bought by foreigners.[10]

How did different asset classes perform during our sample period? Figure 2 shows the

[8]There was little trading in derivatives on German stock exchanges. Official trading in derivatives was stopped completely prior to the First World War and was not resumed until the currency had stabilized (e.g., Buchwald, 1924, p. 233; Schütze, 1925, p. 507).

[9]The German government put in place a few dozen different laws and decrees on foreign exchange between 1920 and 1923. Some laws restricted exchanging *Mark* into foreign exchanges, while others focused on holding and trading securities denominated in foreign currencies. Among all regulations restricting foreign exchange trading by investors, one decree is regularly mentioned as having the most impact. On October 12, 1922, the government introduced a decree (*Verordnung gegen die Spekulation in ausländischen Zahlungsmitteln*, *Reichsgesetzblatt* 1922, p. 796) which essentially outlawed using any currency other than the *Mark* for transactions. The maximum penalty for violations was three years in prison.

[10]According to the Statistical Office of Berlin, 63% of house purchases were conducted by individuals living outside of Germany between September 1922 and January 1923.

evolution of the national CPI, the German stock market index, the dollar/*Mark* exchange rate, the price of the 4.5% German government bond (one of the most liquid debt securities), and real estate prices for Germany in nominal terms between February 1920 and September 1923.[11] Investments in stocks and the dollar closely follow the consumer price index, implying that investments in these two asset classes offered the ability to hedge against inflation. In contrast, prices of the government bond and real estate remain almost flat, indicating that such assets did not offer inflation protection.

3 The money illusion hypothesis

Modigliani and Cohn (1979) describe how inflation influences investors' valuations. They argue that investors make two valuation errors. First, investors mistakenly use nominal rates to discount real future cash flows of firms. Following Cohen et al. (2005), we formalize this idea using the Gordon Growth Model, and express the dividend-price ratio at time t as

$$\frac{D_{t+1}}{P_t} = R - G, \tag{1}$$

where D_{t+1} is the nominal dividend per share paid at time $t+1$, P_t is the price per share at time t, R is the nominal discount rate, and G is the nominal growth rate of future cash flows. A rise in inflation increases both R and G equally, leaving the dividend-price ratio unaffected. However, investors subject to money illusion adjust only the discount rate R, but do not update the growth rate G. As explained by Asness (2003) and Cohen et al. (2005), estimating long-term growth rates in cash flows for stocks is far from trivial for investors, even in today's environment. As a result, when inflation increases, investors subject to money illusion require a higher dividend yield in order to hold stocks, which makes them less likely to buy and more likely to sell shares.

Notice that investors subject to money illusion do not make the same mistake when they value bonds. As bonds offer constant cash flows, the growth rate G is irrelevant. Under increasing inflation, investors only have to adjust R, which they do correctly, even if they are

[11] The data on real estate prices come from Jordà et al. (2019).

subject to money illusion. Therefore, the valuation of bonds by investors subject to money illusion should be unbiased.[12]

According to Modigliani and Cohn (1979), investors suffering from money illusion commit a second valuation error. Such investors do not understand that the decrease in accounting profits due to the inflation premium paid by firms on newly issued debt is offset by an increase in shareholders' market value of equity resulting from the depreciation in the real value of nominal liabilities. To formalize this, consider a firm's net income at time t, defined as

$$Net\,Income_t = EBI_t - Interest_t - Inflation\,Premium_t, \tag{2}$$

where EBI_t is nominal earnings before interest at time t, $Interest_t$ is the real interest paid by the firm, and $Inflation\,Premium_t$ is the difference between nominal interest payments and real interest payments. $Inflation\,Premium_t$ compensates debtholders for the real depreciation of their nominal claims expected at issuance. When inflation increases and a firm issues new debt, both EBI_t and $Inflation\,Premium_t$ rise. However, increases in inflation tend to have a disproportionate effect on nominal interest payments.[13] Since accounting principles consider the inflation premium as a cost, higher inflation results in shareholders observing a lower net income for firms that issue substantial amounts of new debt. However, the decline in net income does not correspond to a reduction of the market value of equity. To illustrate this, we can write next period's market value of equity at time $t+1$ as

$$\begin{aligned} Equity_{t+1} = {} & Enterprise\,Value_t - Debt_t + EBI_t \\ & -Interest_t - Inflation\,Premium_t + Debt\,Depreciation_t, \end{aligned} \tag{3}$$

where $Enterprise\,Value_t$ is the market value of the firm's assets in period t, $Debt_t$ is the

[12] Basak and Yan (2010) show that money illusion can also affect investment decisions through a consumption channel. They document that investors subject to money illusion consume less when the price level increases, even if their real income has not changed. Higher expected inflation also reduces future consumption of investors and thereby induces investors to save less. The decline in savings results in investors selling both stocks and bonds when facing higher expected inflation.

[13] For example, a rise in inflation from 3% to 9% causes EBI_t to rise by an additional 6%, assuming all items in the income statement before EBI_t grow proportionally with inflation. In contrast, if nominal interest rates increase from 3% to 9%, nominal interest expenses triple, assuming that existing debt is completely replaced by new debt.

market value of debt, and $Debt\ Depreciation_t$ is the gain accruing to shareholders as a result of the inflation-induced depreciation of the nominal value of debt. Under perfect foresight, the inflation premium is exactly equal to the debt depreciation and hence inflation leaves the market value of equity unaffected. Investors suffering from money illusion, however, base their valuation of a firm's equity only on accounting profits and thus interpret the higher nominal interest payments as an additional cost, ignoring the gains accruing to them as a result of the real depreciation in nominal debt. Hence, they reduce their demand for stocks of firms that issue substantial amounts of new debt when these firms face increasing inflation.

4 Empirical approach

We test the first form of Modigliani and Cohn (1979)'s money illusion hypothesis using the following equation:

$$Buy - sell\ imbalance_{i,t} = \alpha_t + \alpha_i + \beta Local\ inflation_{i,t} + Controls_{i,t} + \epsilon_{i,t}. \qquad (4)$$

The $Buy - sell\ imbalance_{i,t}$ of investor i in month t is defined as

$$Buy - sell\ imbalance_{i,t} = \frac{\#\,buys_{i,t} - \#\,sells_{i,t}}{\#\,buys_{i,t} + \#\,sells_{i,t}}, \qquad (5)$$

where $\#\,buys_{i,t}$ ($\#\,sells_{i,t}$) is the number of stock purchases (sales) by investor i in month t. The buy-sell imbalance captures investors' net demand for stocks in a given month.[14] α_t are year-month fixed effects that control for the overall time trend, thereby accounting for factors such as national inflation and overall economic conditions. α_i are client fixed effects, which control for time-invariant investor characteristics, such as gender. $Local\ inflation_{i,t}$ is the inflation in month t of the town where investor i lives. We assume that local inflation experienced by investors shapes their inflation expectations. This assumption is in line with Malmendier and Nagel (2016) and D'Acunto et al. (2021), who show that, when individuals

[14] Our buy-sell imbalance measure is based on the number of purchases and sales as the market value of stock trades is influenced by inflation. In robustness tests reported in Table IA1 in the Internet Appendix, we replicate our main analysis using buy-sell imbalances based on the face value of stock trades and using clients' stock holdings. This does not materially change our findings.

form inflation expectations, they rely heavily on experienced price changes. To make the local inflation variable more normally distributed, we follow previous research and make use of the inverse hyperbolic sine transformation (e.g., Burbidge et al., 1988; Kale et al., 2009; Karlan et al., 2016).[15] $Controls_{i,t}$ represents a set of time-varying town-level characteristics. $\epsilon_{i,t}$ is the error term. The money illusion hypothesis predicts a negative β for stock trades, i.e., a negative relationship between local inflation experienced by investors and investors' buy-sell imbalance for stocks. The hedging hypothesis predicts a positive β.

To test the second form of money illusion of Modigliani and Cohn (1979), we analyze the relationship between local inflation at a firm's headquarters, the annual change in the firm's net leverage, and clients' investment behavior in shares of that firm using the following equation:

$$Buy - sell\,imbalance_{i,j,t} = \alpha_{i,t} + \alpha_j + \gamma Local\,inflation_{j,t} + \delta \Delta Net\,leverage_{j,t} \quad (6)$$
$$+\beta Local\,inflation_{j,t} \times \Delta Net\,leverage_{j,t} + Controls_{j,t} + \epsilon_{i,j,t,},$$

where $Buy - sell\,imbalance_{i,j,t}$ is the buy-sell imbalance of investor i for shares of firm j in month t. $\alpha_{i,t}$ are client-year-month fixed effects that absorb both time-invariant and time-varying investor characteristics, such as faith in the German economy, changing risk aversion, and liquidity needs.[16] α_j are firm fixed effects that control for firm characteristics that remain constant over time, such as the firm's industry. $Local\,inflation_{j,t}$ is the inflation rate in month t of the town where firm j is located. We use the inflation at the firm's headquarters because it is the figure creditors likely use to form their inflation expectations and calculate the inflation premium on the firm's debt, for example, if debt is provided by local banks. $\Delta Net\,leverage_{j,t}$ is the annual change in the net leverage of firm j at time t. To test the second form on money illusion, we would ideally use newly issued debt, as this is the main determinant of nominal interest payments in times of rising prices. Since we do not have

[15]Taking the inverse hyperbolic sine is an alternative to a log-transformation when a variable takes on zero or negative values. In robustness tests shown in Table IA1 in the Internet Appendix, we rerun our main analysis using raw inflation, the natural logarithm of inflation (setting months with negative inflation to zero), and inflation deciles. Our findings remain qualitatively unchanged.

[16]The inflation rate experienced by the investor in a given month is captured by client-year-month fixed effects. Hence, client-year-month fixed effects also control for the first form of money illusion.

detailed information on newly issued debt of firms, we take the annual change in net leverage as a proxy for newly issued debt. When inflation rises, firms that increase their net leverage are likely to experience a stronger reduction in net income, due to higher nominal interest payments on the new debt. Hence, the coefficient of interest in equation (6) is the β on the interaction term $Local\ inflation_{j,t} \times \Delta Net\ leverage_{j,t}$. The second form of Modigliani and Cohn's (1979) money illusion hypothesis predicts a negative β, i.e., investors reduce their demand for stocks of firms that experience increasing inflation and increasing net leverage.

5 Data

5.1 Investor data

We obtain the security portfolio data from a German bank. The bank's core business was in private and investment banking, serving private and institutional clients. The bank offered a broad range of wealth management services to its private clients, including securities accounts. While the bank was headquartered in Germany, and thus mainly targeted German clients, it also offered its services to clients living abroad.

In the pre-digital era, banks kept track of client-level security portfolios in so-called deposit books (*Depotbücher*). The Law of Deposits (*Depotgesetz*) required them to do so, which ensures that the information on transactions and holdings in these books is comprehensive (e.g., Buchwald, 1924, pp. 427-428). Specifically, the deposit books record, for each client, every transaction, and after each transaction, the holdings in the respective security. The deposit books also provide several investor characteristics, such as the clients' places of residence and whether they hold accounts at other banks. The deposit books that cover our sample period contain information on roughly 3,500 private clients of our bank. We drop around 700 clients for which we cannot identify the account holder.[17] We also drop around 500 clients with zero portfolio holdings during our investigation period. This leaves us with 2,262 clients who execute 49,415 transactions between January 1920 and December 1924. Figure IA1 in

[17] Among them are a few clients who delegated account management to the bank. Hence, clients in our final sample likely traded on their own.

the Internet Appendix shows a sample page from the deposit books.

5.2 Firm data

For each German firm whose shares the clients trade, we hand-collect balance sheet data. This information comes from the Handbook of German Stock Corporations (*Handbuch der Deutschen Aktiengesellschaften*). The handbooks report annual information on publicly listed corporations in Germany. Specifically, they include, for each firm-year, a brief description of the firm's business, the most recent balance sheet and income statement, as well as information on the composition of the management board and the supervisory board. To determine a firm's net leverage, we collect data on nominal assets and nominal liabilities at the end of every fiscal year. We follow French et al. (1983) and Ritter and Warr (2002), who compute net leverage as the sum of nominal liabilities less the sum of nominal assets, all scaled by total assets. Nominal assets primarily include cash, cash equivalents, and receivables. Nominal liabilities are total assets less equity. We then calculate annual changes in net leverage as the difference between this year's and last year's net leverage. In our final sample, we have 623 German companies whose securities are traded by the clients and for which we have balance sheet data. Figure IA2 in the Internet Appendix shows a sample page from the handbooks.

We also hand-collect month-end market prices of stocks traded on the Berlin Stock Exchange between December 1919 and December 1924. These data come from the Berlin Stock Exchange Newspaper (*Berliner Börsen-Zeitung*). We then use monthly stock prices to compute monthly stock returns. The clients in our final sample trade stocks of 553 firms for which we have return data. Figure IA3 in the Internet Appendix provides a sample page from the Berlin Stock Exchange Newspaper.

In addition, we hand-collect data on dividend payments for each firm listed on the Berlin Stock Exchange. These data come from a book entitled The Coupon (*Der Zinsschein*), which contains information on dividend payments and coupon payments of almost all German firms and important foreign companies. Our clients trade stocks of 485 firms for which we have dividend data. Figure IA4 in the Internet Appendix shows a sample page from this book.

5.3 Local inflation data

We additionally hand-collect information on monthly local consumer prices from the Quarterly Issue of the German Statistical Office (*Vierteljahresheft zur Statistik des Deutschen Reichs*). Starting in December 1919, the statistical office collected prices of a basket of goods considered representative for a family of five members in each German town with more than 10,000 inhabitants and constructed a local consumer price index.[18] These data were originally compiled because the German Department of Labor (*Reichsarbeitsministerium*) needed information on local price changes as a basis for wage negotiations. We compute monthly local inflation as the percentage change in a town's CPI between the current and the previous month. In total, we have monthly inflation data for 633 German towns between January 1920 and December 1924. We merge inflation data, investor data, and firm data by assigning clients and firms to the closest town for which we have inflation data within a 25 km radius.[19] We end up with clients and firms being matched to 256 different towns with inflation data. Figure IA5 in the Internet Appendix provides a sample page showing the consumer price index data from the German Statistical Office.

5.4 Descriptive statistics

Table 1 reports the descriptive statistics. Panel A presents sociodemographic variables of the clients in our sample. About 72% of the bank customers are male and 89% live in Germany. Moreover, 9% of clients hold an account with another bank. This suggests that clients typically do not have additional accounts with other banks and our bank appears to be the house bank of most clients. This allows for a comprehensive view of investors' behavior.

Panel B describes the composition of the clients' portfolios. On average, a portfolio consists of about three securities. This figure is comparable to discount brokerage house data

[18]D'Acunto et al. (2021) show that when forming inflation expectations, individuals strongly rely on experienced grocery price changes. Groceries are the most important category in the basket of goods used by the statistical office. According to a sample calculation from 1920, groceries make up approximately 80% of the basket.

[19]For 92% (64%) of clients (firms), we have inflation data for the town where they live (have their headquarters). For the remaining clients (firms), the average distance between their place of residence (headquarters) and the town for which we have inflation data is 9 (5) km.

from the 1990s introduced by Barber and Odean (2000). The average portfolio of the clients in our sample consists of about 49% stocks denominated in *Mark*, 32% bonds denominated in *Mark*, and 13% securities denominated in foreign currencies.[20]

Panel C provides information on the clients' trades. The average client executes 0.8 trades per month (i.e., almost ten trades per year). Around 54% of the sample trades are purchases, 51% of trades involve stocks, 30% bonds, and 13% foreign securities. Our main variable capturing clients' investment behavior is the monthly buy-sell imbalance. The average monthly buy-sell imbalance for stocks is 0.18. It is 0.07 for bonds and 0.07 for securities denominated in foreign currencies. The positive average buy-sell imbalance for stocks can be explained by many companies issuing new shares during our sample period. The equity issuance volume was primarily driven by substantial capital needs of firms in the early 1920s, when the German economy did relatively well. The inflation amplified this trend as rising costs forced firms to raise even more capital (e.g., Aron, 1927; Bresciani-Turroni, 1937, p. 255).

To shed light on the representativeness of the clients of our bank, we compare the distribution of the clients' wealth with the distribution of the wealth of the German population. We use the portfolio market value in January 1920 (the beginning of our sample period) as a proxy for clients' financial wealth. Data on the distribution of the population's net wealth come from the wealth tax collected at year-end 1913.[21] For individuals subject to the wealth tax, financial wealth accounted for 57.8% of net wealth. We use this figure to estimate our clients' net wealth from the portfolio market values. Moreover, we deflate the estimated net wealth of clients in January 1920 using the national inflation rate to obtain an estimate for the net wealth of clients in December 1913. Figure IA6 in the Internet Appendix shows the comparison of the distribution of clients' net wealth with the distribution of net wealth of

[20]Stocks denominated in foreign currencies account for 18% of the holdings in foreign securities, bonds denominated in foreign currencies account for 74%, and foreign bills account for 7%. Holding and purchasing foreign exchange was difficult for German investors during our sample period. Some foreign securities were still available to them. These were mainly securities of issuers located in countries that were allied with Germany during the First World War (e.g., the countries that were part of the Austro-Hungarian Empire and the Ottoman Empire).

[21]Germany not only collected a wealth tax in 1913, but also in other years. However, there is no or only limited data available on wealth taxes collected in other years. Data on the wealth tax in 1913 come from the German Statistical Office.

the German population subject to the wealth tax. Notice that only individuals who had net wealth of more than 10,000 *Mark* were subject to the wealth tax in 1913, corresponding to about 2.8 million individuals (or 4.3% of the population). Clients in our sample show a wealth distribution similar to individuals subject to the wealth tax, suggesting that they are representative of Germany's upper class at the time.

In Panel D of Table 1, we present summary statistics on net leverage of firms in our sample. The average net leverage amounts to 14%. The average annual change in net leverage is 1%.

Panel E shows descriptive statistics on the monthly local inflation of towns where at least one client lives or where at least one firm is headquartered. This is our main explanatory variable. The average (median) monthly local inflation rate amounts to 538% (9%) between 1920 and 1924. However, this number hides substantial cross-sectional and time-series variation. For instance, in October 1920, the town with the highest inflation rate was Beuel, which is a part of Bonn today, with 18%, while Aschaffenburg, near Frankfurt am Main, the town with the lowest inflation rate, experienced a reduction in prices of 3%. In 1920, the average monthly local inflation rate across all towns was 7%. It declined to 5% in 1921, rose to 38% in 1922, and reached 2,945% in 1923. In 1924, the year after the successful stabilization of the currency, the monthly local inflation rate averaged only 0.9%. In Figure 3, we plot the inverse hyperbolic sine of monthly inflation of all 256 towns in our sample over time.

Figure 4 shows the geographical distribution of the clients and the firms in our final sample. We plot the map of Germany in 1920 and, for reference, the map of Germany today (in grey). We mark the 256 towns for which we have inflation data and to which we assign at least one client (blue dots) or at least one firm (red dots). The figure reveals that both investors and firms are quite evenly distributed across Germany, with clusters that broadly follow the distribution of the population. Specifically, clients and firms are concentrated around Berlin in the East (of contemporary Germany), in the North around Hamburg, in the industrial Ruhr area in the West, as well as in central Germany.

5.5 Determinants of local inflation

The cross-sectional and time-series variation in monthly local inflation that we exploit in our analysis is likely not random. Thus, we next explore the determinants of monthly local inflation. We estimate ordinary least squares (OLS) regressions and use the inverse hyperbolic sine of monthly inflation of towns in our sample as the dependent variable. The sample starts in January 1920 and ends in September 1923, shortly before Germany reformed its currency. As explanatory variables, we use the natural logarithm of local population in 1919, a dummy variable that equals one for territories occupied by the French or Belgian troops, the monthly local unemployment rate, a dummy variable that equals one for towns with a branch of the German Central Bank, and the fraction of local employees working in the paper industry in 1921.[22]

Results are reported in Table 2. We find that monthly local inflation is higher in towns that are larger (Column 1), that were occupied by the French or Belgian troops (Column 2), and that experience lower unemployment (Column 3). Inflation is also higher in towns with a branch of the central bank (Column 4) and in towns located in counties with a higher fraction of employees working in the paper industry (Column 5). The latter result lends support to the notion that the German Central Bank made wide use of local firms to produce bank notes.[23] In Column 6, we include all explanatory variables simultaneously. In this specification, we still find the occupied dummy variable, the monthly local unemployment rate, and the fraction of employees working in the paper industry to be significantly related to monthly local inflation. Finally, in Column 7, we augment this regression with year-month and town fixed effects, which control for the overall time trend and all time-invariant determinants of local inflation. We find that the dummy variable indicating the occupation of a town remains significantly related to inflation. Taken together, we document that local

[22]The German Statistical Office provides data on the population of towns in 1919. Data on monthly local unemployment come from the German Employment Agency (*Reichsamt für Arbeitsvermittlung*) and the German Department of Labor. The German Department of Labor also provides information on the number of employees working in the paper industry in 1921. Finally, the German Central Bank reports the locations of its branches in its annual reports.

[23]At the end of 1923, more than 300 paper mills worked continuously to supply the public with Reichsbank notes (Braun, 1990, p. 39). In an additional test, we run instrumental variables regressions in which we use the local availability of raw paper, proxied by the fraction of local employees working in the paper industry, as instrument for local inflation.

inflation is not randomly distributed, but correlated with other local factors. Thus, the regressions that follow include year-month and client fixed effects as well as our two time-varying determinants of local inflation.

6 Empirical results

This section contains our empirical results. First, we investigate the relationship between local inflation and clients' buying and selling behavior in stocks (Section 6.1). Second, we investigate the influence of changes in net leverage of firms on the relationship between local inflation and investors' behavior (Section 6.2). We then study the association between local inflation and the returns following stock sales (Section 6.3). Finally, we run numerous tests to rule out alternative explanations (Section 6.4).

6.1 Local inflation and stock trades

6.1.1 Baseline results

To test for the first form of money illusion of Modigliani and Cohn (1979), we regress monthly buy-sell imbalances for stock trades of clients on the monthly local inflation rate, as outlined in equation (4). Depending on the estimated specification, we include controls and fixed effects. In all our regressions, we double-cluster standard errors at the town and month level.[24]

We present the results in Table 3. In Column 1, we include year-month fixed effects to control for the overall time trend. The coefficient estimate is negative and statistically significant at the 5% level. In Column 2, when adding client fixed effects that control for all time-invariant investor characteristics, the documented effect becomes statistically and economically stronger. The negative coefficient estimate suggests that investors buy less (sell more) stocks when facing higher local inflation. We find that a 1% increase in local inflation is associated with a 3.5% decline in the buy-sell imbalances for stocks. In Column 3, local inflation is measured over the current month and the previous month (rather than over the

[24] We also estimate our main regressions using the spatial correction proposed by Conley (1999), with different thresholds (25 km, 50 km, 75 km, 100 km, 125 km, and 150 km). Results remain virtually unchanged.

current month only). Consistent with the idea that not only the contemporaneous inflation affects clients' inflation expectations but also the inflation experienced in the recent past, we again find a strong negative relation between local inflation and stock buy-sell imbalances. In Column 4, we augment the regression with the two time-varying control variables from Table 2, a dummy variable that equals one if a town was in occupied territory in a given month and the local unemployment rate. Including them, however, does not materially change our findings.[25] In Columns 5 and 6, we split the sample period into two subperiods. In the first subperiod, from January 1920 to June 1922, the German economy did relatively well and experienced comparably low inflation.[26] The second subperiod, from July 1922 to September 1923, is characterized by the hyperinflation. We find the relationship between inflation and stock buy-sell imbalances to be negative and statistically significant in both subperiods. Taken together, we document a strong negative relation between local inflation and buy-sell imbalances for stocks, which supports the money illusion hypothesis, but not the hedging hypothesis.[27]

In our baseline regression, we use local inflation in the current month rather than lagged local inflation as our main explanatory variable. To shed additional light on whether contemporaneous or lagged inflation matters for investors, we replicate our analysis at the weekly level, including several lags of inflation. Weekly inflation data are available from July 12, 1923 onwards. We compute weekly buy-sell imbalances over the same time period over which weekly inflation is measured. Results are presented in Table IA2 in the Internet Appendix. In Column 1, we include time fixed effects. Column 2 additionally contains client fixed effects. In Column 1, we find the relationship between local inflation and buy-sell imbalances to be negative up to the fourth lag, albeit not statistically significant. In Column 2, the relation-

[25]We do not include the control variables in all specifications as they are not available for all sample towns and months.

[26]In Figure IA7 in the Internet Appendix, we show the monthly number of applicants per 100 open positions in Germany between January 1920 and December 1924. These data come from the German Statistical Office. Unemployment only started to rise towards the end of 1922, providing evidence that the Germany economy did well in the first part of our sample period.

[27]In robustness tests reported in Table IA1 in the Internet Appendix, we replicate our main analysis and use alternative measures for local inflation and individual investors' trading response. The details of these tests are described in the Internet Appendix. Across all specifications we find a negative and statistically significant relation between local inflation and investors' stock trading activities.

ship is significantly negative up to the fifth lag. This suggests that it is local inflation in the last few weeks that matters for investors, and not local inflation in the more distant past, supporting the use of contemporaneous inflation in our baseline regression specification.

So far, we restricted our analysis to the period from January 1920 to September 1923, which is the time period characterized by rising prices. Next, we test whether we find consistent results when we explore a reverse inflation shock. In particular, we investigate trading patterns in a 12-month window around October 1923, when the German government successfully implemented a stabilization policy. Within a few weeks after the reform, inflation dropped sharply (see Figure 3). In principle, a reduction in inflation should produce the opposite effect of what we showed in Table 3. As inflation declined close to zero, nominal and real discount rates converged. Hence, investors subject to money illusion no longer make a valuation error and we expect them to increase their demand for stocks after the reform. The effect should be greater for clients who experienced higher inflation right before the reform as they made greater errors. We identify these investors in two ways. First, we take the cumulative inflation rate over the six months preceding the currency reform of the town where the investor lives. Second, we compare clients living in Germany with clients living in neighboring countries.[28] To test this conjecture, we adapt equation (4) in the following ways:

$$Buy - sell\,imbalance_{i,t} = \alpha_t + \alpha_i \tag{7}$$

$$+\beta Local\,inflation_{i,Apr.-Sep.1923} \times Post\,reform\,(d)_t + \epsilon_{i,t},$$

$$Buy - sell\,imbalance_{i,t} = \alpha_t + \alpha_i + \beta Germany\,(d)_i \times Post\,reform\,(d)_t + \epsilon_{i,t}, \tag{8}$$

where $Local\,inflation_{i,Apr.-Sep.1923}$ is the cumulative inflation rate in the 6-month period preceding the currency reform (from April to September 1923) of the town where investor i lives. $Post\,reform\,(d)_t$ is a dummy variable that takes the value of one in the 6-month period following the currency reform (from October 1923 to March 1924), and zero otherwise.

[28] In 1923, Germany's neighboring countries were Austria, Belgium, Czechoslovakia, Denmark, France, the Free City of Danzig, Lithuania, Netherlands, Poland, Switzerland, and the Territory of the Saar Basin (*Saargebiet*). Germany not only had the highest inflation rate among its neighbors, but the highest inflation rate in the world (e.g., Hanke and Krus, 2013).

$Germany\,(d)_i$ is a dummy variable that equals one for investors who live in Germany and zero for investors who live in neighboring countries. For both regressions, the money illusion hypothesis predicts a positive β.

We present the results in Table 4. Estimates from equation (7) are shown in Column 1. We find that, after the introduction of the stabilization policy, clients living in towns with higher pre-stabilization inflation buy more (sell less) stocks after the stabilization compared to clients in towns with lower pre-stabilization inflation. Estimates for equation (8) are presented in Column 2. We find that, after the currency reform, clients living in Germany increase their demand for stocks compared to clients living abroad.[29] Taken together, the analysis of the trading patterns around the currency reform of October 1923 confirm our baseline result from Table 3 that there is a negative relation between local inflation experienced by investors and investors' buy-sell imbalances for stocks.

6.1.2 Cross-sectional results

Next, we analyze the heterogeneity in the relation between local inflation and stock trades across clients. Existing research shows that sophisticated investors are less prone to behavioral biases (e.g., Feng and Seasholes, 2005; Locke and Mann, 2005; Grinblatt et al., 2016). Moreover, anecdotal evidence suggests that sophisticated investors bought large amounts of stocks during our sample period (e.g., Bresciani-Turroni, 1937, pp. 290-298). Hence, we investigate whether sophistication reduces the documented effect. We use four different measures to capture individual investors' sophistication. Following existing studies, we take the portfolio value as a proxy for sophistication (e.g., Hirshleifer et al., 2008; Barber et al., 2016). We create a dummy variable that takes the value of one for clients with above median portfolio market value in January 1920 and zero for those below the median.[30] The second sophistication proxy is a dummy variable that equals one for clients with above median number of different stocks in the portfolio in January 1920 and zero for those below the median. This measure captures

[29] Figure IA8 in the Internet Appendix graphically illustrates the increase in stock buy-sell imbalances of clients living in Germany around the currency reform relative to clients living in neighboring countries.

[30] Clients' portfolio market value is affected by inflation. That is why we measure it at the beginning of our sample period and not over time.

investors' degree of diversification (e.g., Feng and Seasholes, 2005). The third sophistication measure is a dummy variable that equals one for clients who are employees of our bank. Prior research shows that financial professionals tend to be more sophisticated than retail traders (e.g., Locke and Mann, 2005). The fourth sophistication proxy is a dummy variable that equals one for investors who traded on margin. As highlighted by Bresciani-Turroni (1937, p. 294), sophisticated investors quickly realized during the German hyperinflation that trading with borrowed money increased profits as debt depreciated quickly due to rising prices. To test the conjecture that sophistication reduces money illusion, we use our main specification from Column 2 of Table 3 that includes both time and client fixed effects and interact the local inflation variable with our sophistication measures.

Results are shown in Table 5. We continue to find a negative and statistically significant coefficient on the local inflation variable across all four columns. However, the significantly positive coefficient on the interaction term implies that the negative relationship between local inflation and buy-sell imbalances is weaker for more sophisticated investors. This is in line with our conjecture that sophisticated investors are less prone to money illusion.

To shed additional light on the behavior of sophisticated investors, we rerun our analysis for institutional clients of our bank. Our bank not only served as a broker for private clients, but also for institutional clients, such as banks, insurance companies, and pension funds. Professional investors as a whole are typically considered to be sophisticated market participants whose transactions should be less dependent on local inflation. We hand-collect security portfolio data of 223 institutional investors who execute 6,575 trades between January 1920 and September 1923, of which 5,426 are stock trades. We then replicate the main regression specifications from Table 3 using these institutional transactions.

We report the results in Table IA3 in the Internet Appendix. The relationship between local inflation of the towns where institutional investors are located and the buy-sell imbalances for stocks is positive across all four specifications. It is not statistically significant at conventional levels in Columns 1 and 4 but is statistically significant at the 10% level in Columns 2 and 3. This suggests that institutional investors are not subject to money illusion. If anything, they buy more (sell less) stocks when facing higher local inflation, which is consistent with institutional investors hedging against local price increases.

6.2 Local inflation, firm leverage, and stock trades

To test the second form of money illusion of Modigliani and Cohn (1979), we run the regression specified in equation (6). We use clients' buy-sell imbalance in individual stocks as our dependent variable. Unlike in previous regressions, we do not use the inflation rate of the town where the investor lives as explanatory variable, but the inflation rate of the town where the firm is headquartered. This is because nominal interest payments are likely to be determined locally, for example, if the creditors are local banks. We additionally include the annual change in net leverage and the interaction term between local inflation at the firm's headquarters and the annual change in net leverage. Furthermore, we include the natural logarithm of total assets and profitability as controls. Note that the unit of observation is stock j traded by investor i in month t. This enables us to not only include client and time fixed effects in the regression, but also client-time fixed effects.

Results are reported in Table 6. In all specifications, we find a negative coefficient on the interaction term between local inflation and a firm's change in net leverage. The coefficient estimate is statistically significant at the 5% level in three out of four specifications and statistically significant at the 10% level in Column 3, where we control for time, client, and firm fixed effects. The results presented in this section are consistent with the second form of money illusion of Modigliani and Cohn (1979). Investors reduce their demand for stocks of firms that issue greater amounts of new debt when these firms face increasing inflation.

6.3 Local inflation and the performance of stock sales

Next, we analyze the relation between local inflation and the performance of stock sales. In inflationary periods, investors subject to money illusion are more likely to sell stocks since they perceive them to be overvalued. If these stocks were truly overvalued, we should observe negative real returns following inflation-induced stock sales. However, we find the average

3-month (6-month) real return following stock sales to be 55% (79%).[31] This provides first suggestive evidence that stocks sold are not overvalued. We then investigate whether foregone profits following stock sales are correlated with local inflation experienced at the time of the sale. To do so, we estimate the following regression equation:

$$r_{i,j,t+1,t+\tau} = \alpha_t + \alpha_i + \alpha_j + \beta Local\,inflation_{i,t} + \epsilon_{i,j,t}, \tag{9}$$

where $r_{i,j,t+1,t+\tau}$ is the real return of stock j over the window $t+1, t+\tau$ sold by investor i in month t. α_t are year-month fixed effects, α_i correspond to client fixed effects, and α_j are firm fixed effects. Including year-month fixed effects has an effect similar to computing market-adjusted returns because we compare returns of trades conducted in the same month over the same post-trade time window. $Local\,inflation_{i,t}$ is the inflation rate experienced by client i in month t. The money illusion hypothesis predicts β to be zero or positive.

We present the results in Table 7. In Columns 1 to 3 (Column 4), we measure the real returns of stock sales over a 3-month (6-month) period following the stock sales. Across all specifications, we find a positive relationship between local inflation in the month of the stock sale and real stock returns in the months following the sale. We find the relationship to be statistically significant at the 10% level in Column 1, where we only include time fixed effects, and in Column 2, where we add firm fixed effects. Results are not statistically significant at conventional levels in Columns 3 and 4, when adding client fixed effects and when investigating the performance over a 6-month period. The positive coefficient suggests that stock sales in periods of high local inflation deliver higher real returns than stock sales in periods of low local inflation. Thus, stocks sold by investors facing high inflation tend to be undervalued, rather than overvalued, which is again in line with investors suffering from money illusion.

6.4 Alternative explanations

Up to this point, we have established that investors buy less (sell more) stocks when local inflation increases. To credibly claim that these results are consistent with the first form of

[31] These numbers are similar to the real stock returns reported by Bresciani-Turroni (1937, p. 267 and p. 270) and Dalio (2018, p. 25 and p. 32).

money illusion of Modigliani and Cohn (1979), we need to rule out a number of alternative explanations that could also explain these trading patterns.

6.4.1 Do investors shy away from stocks because local inflation reveals information about gloomy economic prospects of firms?

As argued by Fama (1981), it could be that inflation is a proxy for economic prospects. Thus, in our setting, inflation experienced locally may predict lower growth in firms' future cash flows. Under this alternative explanation, investors reduce their demand for stocks because the fundamental prospects of companies worsen. We already presented evidence inconsistent with this hypothesis. In particular, in Column 5 of Table 3, we replicated our analysis for the time period from January 1920 to June 1922. During this subperiod, inflation was comparably low, and the prospects of the German economy were good. Corroborating the money illusion hypothesis, we found a negative relationship between local inflation and buy-sell imbalances for stocks also in this subperiod.

We run two additional tests to rule out this alternative explanation. First, we rerun the analysis from Table 3 but change the unit of observation. Recall that, in Table 3, the unit of observation is the buy-sell imbalance for all stocks traded by investor i in month t. As our raw data come at the transaction level, we can also compute the buy-sell imbalance for each stock j traded by investor i in month t. This enables us to saturate the regression with security-year-month fixed effects, which control for any time-varying characteristic of the security, such as changes in cash flows. We present the results in Table 8. The coefficient estimates on local inflation have economic magnitudes similar to those in Table 3 and stronger statistical significances. Hence, these results suggest that local inflation does not proxy for the economic conditions at the firm level.

Second, we investigate the relation between local inflation and investment behavior of our clients around economic and political events that may have had a negative effect on future economic conditions. If high local inflation leads investors to adjust the expectations about economic prospects downward, investors located in high-inflation areas should react less to bad news, as their expectations are already low. Conversely, investors in low-inflation areas should react more to these events since they correct their priors more. Inspired by Bittlingmayer (1998), we analyze investors' behavior around four important economic and political events that characterize Germany between January 1920 and September 1923. Specifically, we study the announcement of the reparation amount to be paid by Germany in May 1921, the assassinations of the finance minister Matthias Erzberger in August 1921 and the foreign minister Walther Rathenau in June 1922, and the invasion of the Ruhr area in January 1923. We employ regression specifications similar to equation (7). We compare investors' response to inflation in the six months prior to each event to investors' response to inflation in the six months after each event. Local inflation is measured as the cumulative inflation rate over the six months preceding the respective event. For each event, we create a dummy variable that equals one after the event. Each of the four dummy variables is interacted with the respective cumulative local inflation variable. The coefficients of interest are the ones on the interaction terms as they capture investors' differential response to inflation around bad economic and political news. We report the results in Table 9. Across all specifications, the coefficient estimates on the interaction terms are never statistically significant, indicating that investors' response to inflation is uncorrelated with these events. Taken together, the results in this subsection suggest that our main findings are not driven by increases in investors' fear of deteriorating economic prospects of firms.

6.4.2 Do investors shy away from stocks because inflation increases their risk aversion?

Next, we investigate the possibility that clients buy less (sell more) stocks because news of higher inflation increases their risk aversion (e.g., Brandt and Wang, 2003; Cohen et al., 2005). The tests presented in Table 9 and discussed above enable us to also address this concern. Bad economic and political news in Germany most likely not only affected investors' expectations about economic prospects, but also their risk aversion. If high local inflation results in higher risk aversion, investors located in high-inflation areas should react less to bad news as their risk aversion is already high. In contrast, investors who live in areas that previously experienced low inflation should react more to the release of bad news since they adjust their risk aversion more. However, as discussed above, we do not find evidence for a differential response to inflation around these events.

We perform an additional test to rule out the possibility that changes in risk aversion explain our findings. In particular, we rerun our main specifications from Tables 3 and 8 separately for low-volatility stocks and high-volatility stocks. If inflation increases individuals' risk aversion, we expect clients to primarily divest risky stocks. We classify stocks as low-volatility stocks (i.e., safer stocks) if they experienced below median stock return volatility over the past six months and as high-volatility (i.e., riskier stocks) if they experienced above median stock return volatility over the past six months. Results for low-volatility stocks (high-volatility stocks) are presented in Panel A (Panel B) of Table 10. Coefficient estimates on local inflation are very similar in both panels. In fact, when we test for differences in coefficients between the two groups, t-statistics never exceed 0.57, implying that coefficient estimates do not differ. Overall, we do not find evidence that changes in risk aversion explain our results.

6.4.3 Do investors shy away from stocks to finance consumption?

Next, we consider the potential concern that investors sell stocks to finance consumption. Under this alternative explanation, clients are less likely to buy (more likely to sell) stocks if local inflation increases because goods for daily consumption become more expensive.

We address this concern in two ways. First, we investigate the relation between local inflation and clients' trades in bonds. If clients were to reduce their demand for stocks because of consumption needs, we would also expect them to reduce their demand for bonds, since bonds are inferior to stocks as a hedge against inflation. Like stocks, bonds protect against expected inflation, but unlike stocks, they do not protect against unexpected inflation. On the other hand, as suggested by Cohen et al. (2005), investors suffering from money illusion do not make the same valuation mistake when they value bonds. Thus, relative to stocks, bonds become more attractive for investors subject to money illusion. To test this conjecture, we replicate the main specifications from Tables 3 and 8 for bond trades. Results are reported in Table 11. Across all specifications, we find a positive relationship between local inflation and the buy-sell imbalance for bonds. In three specifications, the effect is also statistically significant at least at the 10% level. These results suggest that clients are more likely to buy (less likely to sell) bonds in periods of high inflation. This pattern is not consistent with investors reducing their demand for stocks to finance consumption in times of rising prices. Rather, it suggests that clients reallocate funds from stocks to bonds in inflationary periods.[32]

Second, we compare clients' stock trading behavior in months in which they receive dividends with months in which they do not get any dividends. If clients liquidated stocks to finance their consumption when local prices rise, we would expect them to be less likely to reduce their stock exposure when they receive dividends. To test this hypothesis, we construct a dummy variable that equals one in months in which at least one stock in a client's portfolio pays a dividend, and zero otherwise. We then interact this dummy variable with our local inflation variable. If dividend payments alleviate financial constraints and reduce the need to sell stocks to finance consumption, the coefficient on the interaction term should be positive. We present the results in Table 12. Across all specifications, the coefficient on the interaction term is negative. It is statistically significant in Columns 1 to 4 and not statistically significant at conventional levels in Columns 5 to 7, where we control for security-month fixed effects. In line with the previous results, this suggests that clients do not reduce their demand for stocks to finance consumption when local prices rise.

6.4.4 Do investors shy away from stocks because they invest in other asset classes?

We also consider the possibility that the negative association between inflation and stock buy-sell imbalances is due to clients shifting their funds from stocks into other asset classes that potentially offer a hedge against inflation. We first evaluate potential investments in foreign exchange. As discussed in the section on the historical background, trading in foreign currencies was severely restricted during our sample period. This suggests that foreign

[32]In theory, investors could also buy bonds to protect against inflation. For instance, short-term bonds can provide a hedge against inflation if interest rates adjust quickly to changes in inflation. In Table IA4 in the Internet Appendix, we replicate Table 11 separately for short-term German government bonds and all other bonds, which tend to be longer term. We find most coefficient estimates to be positive. Results are statistically stronger for longer-term bonds than for short-term bonds.

exchange most likely did not offer a viable alternative to hedge against inflation.

Nevertheless, we run two tests to rule out this alternative explanation. First, we explore the relationship between local inflation and the buy-sell imbalance for securities denominated in foreign currencies. Even though trading in foreign exchange was restricted, we observe some trades in foreign securities. We replicate the main specifications from Tables 3 and 8 using the buy-sell imbalance for foreign securities as the dependent variable. Results are shown in Table 13. We predominantly find negative coefficients on the local inflation variable that are never statistically significant at conventional levels. Hence, there is no evidence that clients reallocate funds from stocks to foreign securities.

Second, we investigate the relation between local inflation and the investment behavior of our clients around a regulatory change introduced on October 12, 1922 that essentially outlawed the use of any currency other than the *Mark* for all types of transactions. Hence, transactions in foreign currencies became significantly more difficult, thereby reducing the set of investment opportunities and making stocks a relatively more attractive hedging instrument. If investors were actively trading foreign exchange to hedge against inflation, they should buy more (sell less) stocks after the regulatory change and we would expect a more positive association between local inflation and buy-sell imbalances for stocks. This effect should be stronger for clients living in towns with higher local inflation. To test this conjecture, we again employ a regression specification similar to equation (7). We present the results in Column 1 of Table 14. We do not find a significant change in the investment behavior of clients around October 1922, suggesting that clients' trading in stocks did not change following the restrictions to trade foreign currencies.

Next, we evaluate whether clients shift assets from stocks to real estate to protect against inflation. As highlighted in the section on the historical background, the housing market was also highly regulated during our sample period. This resulted in negative real returns, suggesting that real estate investments did not offer protection against inflation. Nevertheless, we also run a test to rule out that investors sold stocks to acquire real estate. In March 1922, the German government introduced a new law that softened the cap on rents and increased the relative attractiveness of real estate as an inflation hedge. If investors actively invested in real estate to hedge against inflation, they should buy less (sell more) stocks after the deregulation of the housing market and we would expect a more negative association between local inflation and buy-sell imbalances for stocks after March 1922. This effect should be stronger for clients with higher inflation expectations. To test this prediction, we again employ a regression specification similar to equation (7). Results are presented in Column 2 of Table 14. We do not find a significant change in the investment behavior of clients around this regulatory change, suggesting that investments in real estate were not a viable alternative to hedge against inflation. Hence, the results in this subsection do not support the conjecture that investors reduce their exposure to stocks to invest in other asset classes that offer a hedge against inflation.

6.4.5 Instrumental variables regressions

In an additional test to address the concern that local inflation may be correlated with unobservable determinants of stockholdings, we run instrumental variables regressions that exploit quasi-exogenous variation in local inflation. A distinctive feature of our investigation period is that money usually took the form of bank notes, which had to be printed and brought into circulation. Because of limited production capacity of the German Central Bank and transportation constraints, a major share of bank notes was produced and brought into circulation locally (e.g., Reichsbank, 1924a, 1924b). Thus, we instrument local inflation with the local availability of raw paper used to produce bank notes. We employ the fraction of local employees working in the paper industry at the beginning of the sample period as a proxy for the local availability of paper.

To qualify as a valid instrument, it must satisfy the relevance condition and the exclusion restriction. The relevance condition requires that the local availability of paper is significantly correlated with local inflation. In Table 2, we document the relationship between the fraction of local employees working in the paper industry and local inflation to be positive and significant, pointing towards the instrument's relevance. The exclusion restriction is fulfilled if the local availability of paper does not affect clients' equity investment through a channel other than local inflation.[33] While not directly testable, this is unlikely to be the case because the location of the paper industry was primarily determined by environmental factors: access to spruce and clean river water.[34] Hence, it can be reasonably assumed that instrumented local inflation is exogeneous to other determinants of stockholdings.

We estimate the instrumental variables regressions with two-stages least squares. Results of the first stage are reported at the bottom of Table 15. We regress local inflation on the instrument, region fixed effects, and town-level characteristics. In Columns 2 and 4, we include client characteristics as additional controls. In Columns 3 and 4, we use a dummy variable indicating an above-median share of the local labor force employed in the paper industry rather than the continuous variable. Across all four columns, we obtain positive and significant coefficients on the variable capturing the local supply of paper. Moreover, the F-statistic of the excluded instrument exceeds the often-used threshold of 10 in all specifications (e.g., Staiger and Stock, 1997). These results confirm the instrument's relevance.

Results of the second stage are reported at the top of Table 15. We regress clients' buy-sell imbalances for stocks on (instrumented) local inflation and the same control variables as in the first stage. The coefficient estimate on local inflation is negative and statistically significant across all specifications. This confirms that investors buy less (sell more) stocks when facing higher local inflation. Moreover, these results suggest that individual investors respond to inflation and not to other factors correlated with inflation, lending support to a causal interpretation of our results.

[33]To examine whether the local availability of paper is correlated with local economic conditions, we analyze the relation between the fraction of local employees working in the paper industry and the local unemployment rate. However, we find this correlation to be close to zero, indicating that the paper industry does not cluster in areas of economic prosperity or economic hardship.

[34]To this day, raw paper is made from wood pulp and requires two inputs: grinded wood from conifers and clean water (e.g., Mutz, 2009, p. 46; Torunen, 2012, pp. 84-91). The preferred conifer is spruce because it has the longest cellulose fibers (e.g., Bartels, 2011, pp. 173-177). As a result, the spatial structure of Germany's paper industry was dictated by the location of spruce forest (e.g., Mutz, 2009, p. 50). Moreover, plenty of water was needed for the dissolution of wood fiber into wood pulp, in Germany in 1912 between 650 to 1,050 liters for one kilogram of paper (e.g., Tschudin, 2007, p. 159). However, water quality and not quantity has been the decisive factor, because dirty water resulted in discolored paper (e.g., Bayerl, 1987, p. 419). Hence, paper producers chose to locate near clean rivers, as shown by the histories of many Germany paper producers, which often evolve around access to clean water (e.g., Bartels, 2011, pp. 221-297).

7 Conclusion

In this paper, we study the relationship between inflation and individual investors' decision-making. There are conflicting theories on how inflation affects investors' behavior. We test these competing hypotheses using a unique dataset containing all trades of private clients of a German bank between 1920 and 1924, during the period of the hyperinflation. We find that investors buy less (sell more) stocks when local inflation rises. This effect is more pronounced for investors considered unsophisticated by the extant literature. Moreover, we find the relation between local inflation and real returns following stock sales to be positive, suggesting that investors erroneously sell undervalued stocks in periods of higher local inflation. Overall, our results are in line with individual investors suffering from money illusion as in Modigliani and Cohn (1979). Additional tests indicate that our findings are unlikely to be driven by investors using local inflation as a proxy for future economic outcomes, by investors' risk aversion increasing with local inflation, by investors liquidating stocks to meet consumption needs, and by investors shifting to other asset classes also offering a hedge against inflation. Results from instrumental variables regressions lend support to a causal interpretation of our findings.

To the best of our knowledge, our paper is the first to document empirically that individual investors' behavior is consistent with money illusion. Thus, our results are of particular importance in light of the ongoing debate on the financial literacy of individuals. As highlighted in the introduction, individuals might not be financially literate enough to respond appropriately to the resurfacing inflation currently observed.

References

Aron, A., 1927, Die Kapitalveränderungen deutscher Aktiengesellschaften nach dem Kriege, *Betriebs- und finanzwirtschaftliche Forschung* 32.

Asness, C., 2003, Fight the Fed model: The relationship between future returns and stock and bond market yields, *Journal of Portfolio Management* 30, 11-24.

Barber, B.M., X. Huang, and T. Odean, 2016, Which factors matter to investors? Evidence from mutual fund flows, *Review of Financial Studies* 29, 2600-2642.

Barber, B.M., and T. Odean, 2000, Trading is hazardous to your wealth: The common stock investment performance of individual investors, *Journal of Finance* 55, 773-806.

Barber, B.M., and T. Odean, 2013, The behavior of individual investors, in G.M. Constantinides, M. Harris, and R.M. Stulz (editors): Handbook of the economics of finance (volume 2), Elsevier, Amsterdam.

Bartels, K.B., 2011, Papierherstellung in Deutschland, be.bra wissenschaft verlag, Berlin.

Basak, S., and H. Yan, 2010, Equilibrium asset prices and investor behaviour in the presence of money illusion, *Review of Economic Studies* 77, 914-936.

Bayerl, G., 1987, Die Papiermühle, Verlag Peter Lang, Frankfurt am Main.

Bekaert, G., and X. Wang, 2010, Inflation risk and the inflation risk premium, *Economic Policy* 64, 755-806.

Bittlingmayer, G., 1998, Output, stock volatility, and political uncertainty in a natural experiment: Germany, 1880-1940, *Journal of Finance* 53, 2243-2257.

Boudoukh, J., and M. Richardson, 1993, Stock returns and inflation: A long-horizon perspective, *American Economic Review* 83, 1346-1355.

Branch, B., 1974, Common stock performance and inflation: An international comparison, *Journal of Business* 47, 48-52.

Brandt, M.W., and K.Q. Wang, 2003, Time-varying risk aversion and unexpected inflation, *Journal of Monetary Economics* 50, 1457-1498.

Braun, H.-J., 1990, The German economy in the twentieth century, Routledge, London.

Bresciani-Turroni, C., 1937, The economics of inflation – A study of currency depreciation in post war Germany, George Allen and Unwin, London.

Buchwald, B., 1924, Die Technik des Bankbetriebs, Springer Verlag, Berlin.

Burbidge, J.B., L. Magee, and A.L. Robb, 1988, Alternative transformations to handle extreme values of the dependent variable, *Journal of the American Statistical Association* 83, 123-127.

Cagan, P., 1956, The monetary dynamics of hyperinflation, in M. Friedman (editor): Studies in the quantity theory of money, University of Chicago Press, Chicago.

Cohen, R.B., C. Polk, and T. Vuolteenaho, 2005, Money illusion in the stock market: The Modigliani-Cohn hypothesis, *Quarterly Journal of Economics* 120, 639-668.

Conley, T.G., 1999, GMM estimation with cross sectional dependence, *Journal of Econometrics* 92, 1-45.

D'Acunto, F., U. Malmendier, J. Ospina, and M. Weber, 2021, Exposure to grocery prices and inflation expectations, *Journal of Political Economy* 129, 1615-1639.

Dalio, R., 2018, Big debt crises, Bridgewater, Westport.

Dornbusch, R., 1985, Stopping hyperinflation: Lessons from the German inflation experience of the 1920s, Working Paper, National Bureau of Economic Research.

Evans, P., 1978, Time-series analysis of the German hyperinflation, *International Economic Review* 19, 195-209.

FACG, 2011, VG 2500 Verwaltungsgebiete (Ebenen), 1:2,500,000, as of 1.1.2009, Federal Agency for Cartography and Geodesy, Frankfurt am Main.

Fama, E.F., 1981, Stock returns, real activity, inflation, and money, *American Economic Review* 71, 545-565.

Fama, E.F., and G.W. Schwert, 1977, Asset returns and inflation, *Journal of Financial Economics* 5, 115-146.

Feng, L., and M.S. Seasholes, 2005, Do investor sophistication and trading experience eliminate behavioral biases in financial markets?, *Review of Finance* 9, 305-351.

Ferguson, T., and H.-J. Voth, 2008, Betting on Hitler – The value of political connections in Nazi Germany, *Quarterly Journal of Economics* 123, 101-137.

Firth, M., 1979, The relationship between stock market returns and rates of inflation, *Journal of Finance* 34, 743-749.

French, K.R., R.S. Ruback, and G.W. Schwert, 1983, Effects of nominal contracting on stock returns, *Journal of Political Economy* 91, 70-96.

Frenkel, J.A., 1977, The forward exchange rate, expectations, and the demand for money: The German hyperinflation, *American Economic Review* 67, 653-670.

Grinblatt, M., S. Ikäheimo, M. Keloharju, and S. Knüpfer, 2016, IQ and mutual fund choice, *Management Science* 62, 924-944.

Hanke, S.H., and N. Krus, 2013, World hyperinflations, in R. Parker and R. Whaples (editors): The handbook of major events in economic history, Routledge Publishing, London.

Hirshleifer, D., J.N. Myers, L.A. Myers, and S.H. Teoh, 2008, Do individual investors cause post-earnings announcement drift? Direct evidence from personal trades, *Accounting Review* 83, 1521-1550.

Jordà, O., K. Knoll, D. Kuvshinov, M. Schularick, and A.M. Taylor, 2019, The rate of return on everything, 1870-2015, *Quarterly Journal of Economics* 134, 1225-1298.

Kale, J.R.K., E. Reis, and A. Venkateswaran, 2009, Rank-order tournaments and incentive alignment: The effect on firm performance, *Journal of Finance* 64, 1479-1512.

Karlan, D., M. McConnell, S. Mullainathan, and J. Zinman, 2016, Getting to the top of mind: How reminders increase saving, *Management Science* 62, 3393-3411.

Katz, M., H. Lustig, and L. Larsen, 2017, Are stocks real assets? Sticky discount rates in stock markets, *Review of Financial Studies* 30, 539-587.

Lehmann-Hasemeyer, S., and J. Streb, 2016, The Berlin stock exchange in Imperial Germany: A market for new technology?, *American Economic Review* 106, 3558-3578.

Locke, P.R., and S.C. Mann, 2005, Professional trader discipline and trade disposition, *Journal of Financial Economics* 76, 401-444.

Malmendier, U., and S. Nagel, 2016, Learning from inflation experiences, *Quarterly Journal of Economics* 131, 53-87.

Mankiw, N.G., and R. Reis, 2002, Sticky information versus sticky prices: A proposal to replace the new Keynesian Phillips curve, *Quarterly Journal of Economics* 117, 1295-1328.

Modigliani, F., and R.A. Cohn, 1979, Inflation, rational valuation and the market, *Financial Analyst Journal* 35, 24-44.

Moore, L., 2012, World financial markets, 1900-1925, Working Paper, University of Melbourne.

Moulton, H.G., and C.E. McGuire, 1923, Germany's capacity to pay, McGraw-Hill Publishing Co, London.

MPIDR, 2011, MPIDR Population History GIS Collection, Max Planck Institute for Demographic Research and Chair for Geodesy and Geoinformatics, University of Rostock.

Mutz, M., 2009, Managing resources. Water and wood in the German pulp and paper industry, 1870s-1930s, Economic History Yearbook 50, 45-68.

Reichsbank, 1924a, Perioden der Zahlungsmittelknappheit in den Jahren 1914-1923 und ihre Gründe, sowie die zu ihrer Behebung getroffene Maßnahmen.

Reichsbank, 1924b, Bericht über die von der Reichsbank zur Beseitigung der Zahlungsmittelknappheit entwickelte Tätigkeit.

Ritter, J.R., and R.S. Warr, 2002, The decline of inflation and the Bull Market of 1982-1999, *Journal of Financial and Quantitative Analysis* 37, 29-61.

Salemi, M.K., and T.J. Sargent, 1979, The demand for money during hyperinflation under rational expectations: II, *International Economic Review* 20, 741-758.

Schütze, A., 1925, Saling's Börsen-Papiere – Erster (allgemeiner) Teil, Verlag für Börsen- und Finanzliteratur, Berlin.

Sims, C.A., 2003, Implications of rational inattention, *Journal of Monetary Economics* 50, 665-690.

Staiger, D., and J.H. Stock, 1997, Instrumental variables regression with weak instruments, *Econometrica* 65, 557-586.

Torunen, O., 2012, The paper industry in Germany, 1800-2000, in T. Särkkä, M. Gutiérrez-Poch, and M. Kuhlberg (editors): Technological transformation in the global pulp and paper industry 1800-2018, Routledge Publishing, London.

Tschudin, P.F., 2007, Grundzüge der Papiergeschichte, Anton Hiersemann KG, Stuttgart.

Tables

Table 1: Descriptive statistics

This table presents descriptive statistics on client characteristics (Panel A), portfolio characteristics (Panel B), trade characteristics (Panel C), firm characteristics (Panel D), and local inflation (Panel E). We focus on the time period from January 1920 to December 1924. For time-varying variables, we report averages, except for Panel E, where we report monthly observations. In Panel D, the sample includes firms whose stocks the clients trade. In Panel E, the sample includes towns where at least one client lives or where at least one firm is headquartered. We assign clients and firms to the closest town for which we have inflation data within a 25 km radius based on the place of residence and the location of headquarters, respectively. Appendix A provides detailed descriptions of all variables used throughout the study.

	Mean	Min.	Median	Max.	Std. dev.	N
Panel A: Client characteristics						
Male (d)	0.72	0.00	1.00	1.00	0.45	2,262
Germany (d)	0.89	0.00	1.00	1.00	0.31	2,260
Europe (d)	0.97	0.00	1.00	1.00	0.18	2,260
Other bank account (d)	0.09	0.00	0.00	1.00	0.29	2,262
Panel B: Portfolio characteristics						
Avg. # securities	3.12	1.00	1.53	60.88	4.44	2,262
Avg. % stocks	48.70	0.00	50.00	100.00	42.56	2,262
Avg. % bonds	31.91	0.00	4.59	100.00	40.54	2,262
Avg. % foreign exchange	13.44	0.00	0.00	100.00	28.21	2,262
Panel C: Trade characteristics						
Avg. # trades per month	0.78	0.00	0.50	16.22	1.03	2,262
Avg. % buys	54.21	0.00	50.00	100.00	22.55	2,225
Avg. % stock trades	51.21	0.00	58.82	100.00	41.84	2,225
Avg. % bond trades	30.33	0.00	4.44	100.00	39.65	2,225
Avg. % foreign exchange trades	13.36	0.00	0.00	100.00	27.42	2,225
Avg. buy-sell imbalance for stocks	0.18	-1.00	0.11	1.00	0.40	1,508
Avg. buy-sell imbalance for bonds	0.07	-1.00	0.00	1.00	0.53	1,172
Avg. buy-sell imbalance for foreign exchange	0.07	-1.00	0.00	1.00	0.52	817
Panel D: Firm characteristics						
Avg. net leverage (%)	14.31	-88.89	14.05	89.86	24.02	623
Avg. Δ net leverage (%)	1.10	-74.71	0.10	92.50	16.11	584
Panel E: Local inflation						
Raw local inflation (%)	537.92	-12.36	8.63	35,117.90	3,746.72	13,112

Table 2: Determinants of local inflation

This table presents the results from panel regressions with year-month and town fixed effects. The dependent variable is the inverse hyperbolic sine of local inflation of town c in month t. We focus on the time period from January 1920 to September 1923 and on towns where at least one client lives or where at least one firm is headquartered. We assign clients and firms to the closest town for which we have inflation data within a 25 km radius based on the place of residence and the location of headquarters, respectively. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Local inflation$_{c,t}$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log(local population)$_{c,1919}$	0.021*					0.016	
	(1.69)					(1.67)	
Occupied (d)$_{c,t}$		0.081**				0.073*	0.029*
		(2.20)				(1.86)	(1.89)
Local unemployment rate$_{c,t}$			-6.387***			-6.471***	-0.084
			(-3.28)			(-3.17)	(-0.56)
German Central Bank (d)$_{c,1920}$				0.065*		0.013	
				(1.73)		(0.48)	
% local employees in paper$_{c,1921}$					0.116***	0.162*	
					(3.28)	(1.81)	
Year-month fixed effects	No	No	No	No	No	No	Yes
Town fixed effects	No	No	No	No	No	No	Yes
Adj. R^2	0.001	0.001	0.008	0.001	-0.000	0.010	0.986
N	10,634	10,634	9,629	10,634	10,634	9,629	9,629

Table 3: Local inflation and stock trades

This table presents the results from panel regressions with year-month and client fixed effects. The dependent variable is the buy-sell imbalance for stocks of client i in month t. We focus on the time period from January 1920 to September 1923. In Column 5 (Column 6), we restrict the sample to the time period from January 1920 to June 1922 (July 1922 to September 1923). The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the client lives. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for stocks$_{i,t}$					
					Jan. 1920–Jun. 1922	Jul. 1922–Sep. 1923
	(1)	(2)	(3)	(4)	(5)	(6)
Local inflation$_{i,t}$	-0.536**	-0.650**		-0.548**	-0.990*	-0.584**
	(-2.48)	(-2.63)		(-2.07)	(-1.83)	(-2.42)
Local inflation$_{i,t-1,t}$			-0.353**			
			(-2.57)			
Occupied (d)$_{i,t}$				-0.484*		
				(-1.93)		
Local unemployment rate$_{i,t}$				-2.188		
				(-0.74)		
Year-month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Client fixed effects	No	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.036	0.036	0.035	0.037	0.021	0.055
N	8,057	8,057	7,961	7,962	3,394	4,663

Table 4: Local inflation and stock trades around the currency reform

This table presents the results from panel regressions with year-month and client fixed effects. The dependent variable is the buy-sell imbalance for stocks of client i in month t. We focus on the time period starting six months prior to the currency reform and ending six months after the currency reform. In Column 2, the sample includes all clients who live in Germany and all clients who live in neighboring countries. The variable *Local inflation* is the inverse hyperbolic sine of cumulative local inflation of the town where the client lives over the six months preceding the currency reform. The variable *Post reform (d)* equals one after Germany reforms its currency (October 1923 onwards), and zero otherwise. The variable *Germany (d)* equals one for clients who live in Germany, and zero otherwise. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for stocks$_{i,t}$	
	(1)	(2)
Local inflation$_{i,Apr.-Sep.\ 1923}$ × Post reform (d)$_t$	0.365*	
	(1.89)	
Germany (d)$_i$ × Post reform (d)$_t$		0.339***
		(3.53)
Year-month fixed effects	Yes	Yes
Client fixed effects	Yes	Yes
Adj. R^2	0.081	0.088
N	3,544	3,891

Table 5: Local inflation, client sophistication, and stock trades

This table presents the results from panel regressions with year-month and client fixed effects. The dependent variable is the buy-sell imbalance for stocks of client i in month t. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the client lives. The variable *Wealthy (d)* equals one for clients with above median portfolio market value in January 1920 and zero for clients with below median portfolio market value in January 1920. The variable *Diversified (d)* equals one for clients with above median number of different stocks in the portfolio in January 1920 and zero for clients with below median number of different stocks in the portfolio in January 1920. The variable *Bank employee (d)* equals one for clients who are employees of the bank, and zero otherwise. The variable *Levered (d)* equals one for clients with a levered portfolio, and zero otherwise. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for stocks$_{i,t}$			
	(1)	(2)	(3)	(4)
Local inflation$_{i,t}$	-0.748***	-0.784***	-0.674***	-0.683***
	(-2.82)	(-3.04)	(-2.72)	(-2.80)
Local inflation$_{i,t}$ × Wealthy (d)$_{i,Jan.\ 1920}$	0.035***			
	(4.29)			
Local inflation$_{i,t}$ × Diversified (d)$_{i,Jan.\ 1920}$		0.095***		
		(5.83)		
Local inflation$_{i,t}$ × Bank employee (d)$_i$			0.085***	
			(6.61)	
Local inflation$_{i,t}$ × Levered (d)$_i$				0.053***
				(3.86)
Year-month fixed effects	Yes	Yes	Yes	Yes
Client fixed effects	Yes	Yes	Yes	Yes
Adj. R^2	0.078	0.080	0.038	0.036
N	3,561	3,561	8,057	8,057

Table 6: Local inflation, firm leverage, and stock trades

This table presents the results from panel regressions with client-year-month and firm fixed effects. The dependent variable is the buy-sell imbalance for stock j of client i in month t. We focus on the time period from January 1920 to September 1923. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the firm is headquartered. The variable *Net leverage* is the difference between nominal liabilities and nominal assets at the end of the last fiscal year divided by total assets at the end of the last fiscal year. The variable Δ *Net leverage* is the change in net leverage from the end of the second-to-last fiscal year to the end of the last fiscal year. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for individual stocks$_{i,j,t}$			
	(1)	(2)	(3)	(4)
Local inflation$_{j,t}$	-0.199	-0.189	-0.289	-0.239
	(-0.97)	(-0.91)	(-1.32)	(-1.35)
Δ Net leverage$_{j,t}$	0.162***	0.165***	0.155*	0.157**
	(3.07)	(2.78)	(1.89)	(2.34)
Local inflation$_{j,t}$ × Δ Net leverage$_{j,t}$	-0.122**	-0.135**	-0.129*	-0.112**
	(-2.29)	(-2.27)	(-1.98)	(-2.13)
Log(assets)$_{j,t}$	-0.013***	-0.022***	-0.035**	-0.022
	(-2.75)	(-4.16)	(-2.32)	(-1.11)
Profitability$_{j,t}$	0.087	0.095	0.042	0.052
	(0.66)	(0.57)	(0.15)	(0.13)
Year-month fixed effects	Yes	Yes	Yes	No
Client fixed effects	No	Yes	Yes	No
Firm fixed effects	No	No	Yes	Yes
Client-year-month fixed effects	No	No	No	Yes
Adj. R^2	0.035	0.039	0.038	0.243
N	11,597	11,597	11,597	11,597

Table 7: Local inflation and the performance of stock sales

This table presents the results from panel regressions with year-month, firm, and client fixed effects. The dependent variable is either the 3-month real return following the sale of stock j by client i in month t (Columns 1 to 3) or the 6-month real return following the sale of stock j by client i in month t (Column 4). We focus on trades executed between January 1920 and September 1923. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the client lives. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Real return of individual stock sale$_{i,j,t+1,t+3}$			Real return of individual stock sale$_{i,j,t+1,t+6}$
	(1)	(2)	(3)	(4)
Local inflation$_{i,t}$	1.459*	1.656*	1.159	0.261
	(1.83)	(1.94)	(1.26)	(0.17)
Year-month fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	Yes	Yes
Client fixed effects	No	No	Yes	Yes
Adj. R^2	0.307	0.457	0.482	0.374
N	4,585	4,585	4,585	4,569

Table 8: Local inflation and individual stock trades

This table presents the results from panel regressions with client and security-year-month fixed effects. The dependent variable is the buy-sell imbalance for stock j of client i in month t. We focus on the time period from January 1920 to September 1923. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the client lives. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for individual stocks$_{i,j,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Local inflation$_{i,t}$	-0.364**	-0.570***	-0.614***	-0.514***		-0.492**
	(-2.10)	(-3.48)	(-3.90)	(-3.08)		(-2.44)
Local inflation$_{i,t-1,t}$					-0.296**	
					(-2.30)	
Occupied (d)$_{i,t}$						-0.312
						(-1.10)
Local unemployment rate$_{i,t}$						-7.510**
						(-2.30)
Year-month fixed effects	Yes	Yes	Yes	No	No	No
Client fixed effects	No	Yes	Yes	Yes	Yes	Yes
Security fixed effects	No	No	Yes	No	No	No
Security-year-month fixed effects	No	No	No	Yes	Yes	Yes
Adj. R^2	0.026	0.032	0.038	0.330	0.331	0.329
N	15,189	15,189	15,189	15,189	14,986	15,051

Table 9: Local inflation and stock trades around major events

This table presents the results from panel regressions with year-month and client fixed effects. The dependent variable is the buy-sell imbalance for stocks of client i in month t. We focus on the time period starting six months prior to each event and ending six months after each event. The variable *Local inflation* is the inverse hyperbolic sine of cumulative local inflation of the town where the client lives over the six months preceding each event. The variable *Post reparations (d)* equals one after the Allies set the reparations to be paid by Germany (May 1921 onwards), and zero otherwise. The variable *Post Erzberger (d)* equals one after the assassination of the German finance minister Matthias Erzberger (August 1921 onwards), and zero otherwise. The variable *Post Rathenau (d)* equals one after the assassination of the German foreign minister Walther Rathenau (June 1922 onwards), and zero otherwise. The variable *Post Ruhr (d)* equals one after France and Belgium occupy the Ruhr region (January 1923 onwards), and zero otherwise. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for stocks$_{i,t}$			
	(1)	(2)	(3)	(4)
Local inflation$_{i,Nov.-Apr.\ 1921}$ × Post reparations (d)$_t$	0.758			
	(0.72)			
Local inflation$_{i,Feb.-Jul.\ 1921}$ × Post Erzberger (d)$_t$		0.063		
		(0.07)		
Local inflation$_{i,Dec.\ 1921-May\ 1922}$ × Post Rathenau (d)$_t$			1.016	
			(0.95)	
Local inflation$_{i,Jul.-Dec.\ 1922}$ × Post Ruhr (d)$_t$				0.368
				(0.27)
Year-month fixed effects	Yes	Yes	Yes	Yes
Client fixed effects	Yes	Yes	Yes	Yes
Adj. R^2	0.032	0.062	0.068	0.068
N	1,337	1,367	1,629	3,204

Table 10: Local inflation and trades in low-volatility and high-volatility stocks

This table presents the results from panel regressions with year-month, client, and security-year-month fixed effects. In Columns 1 to 4, the dependent variable is the buy-sell imbalance for stocks of client i in month t. In Columns 5 to 7, the dependent variable is the buy-sell imbalance for stock j of client i in month t. In Panel A (Panel B), we restrict the sample to trades in low-volatility stocks (high-volatility stocks). We classify stocks as low-volatility stocks (high-volatility stocks) if they experienced below (above) median stock return volatility over the past six months. We focus on the time period from January 1920 to September 1923. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the client lives. Appendix A in the main paper provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Low-volatility stocks

	Buy-sell imbalance for low-volatility stocks$_{i,t}$				Buy-sell imbalance for individual low-volatility stocks$_{i,j,t}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local inflation$_{i,t}$	-0.509	-0.912**		-0.992**	-0.655		-0.707
	(-1.21)	(-2.03)		(-2.09)	(-1.57)		(-1.56)
Local inflation$_{i,t-1,t}$			-0.406			-0.360	
			(-0.96)			(-0.96)	
Occupied (d)$_{i,t}$				-0.878***			-0.350
				(-7.14)			(-0.56)
Local unemployment rate$_{i,t}$				1.616			-4.068
				(0.25)			(-0.56)
Year-month fixed effects	Yes	Yes	Yes	Yes	No	No	No
Client fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Security-year-month fixed effects	No	No	No	No	Yes	Yes	Yes
Adj. R^2	0.047	0.046	0.045	0.046	0.274	0.275	0.267
N	2,269	2,269	2,233	2,249	3,029	2,986	3,003

Panel B: High-volatility stocks

	Buy-sell imbalance for high-volatility stocks$_{i,t}$				Buy-sell imbalance for individual high-volatility stocks$_{i,j,t}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local inflation$_{i,t}$	-0.811**	-0.792**		-0.733**	-0.539		-0.542
	(-2.51)	(-2.14)		(-2.02)	(-1.13)		(-1.05)
Local inflation$_{i,t-1,t}$			-0.383			-0.080	
			(-1.01)			(-0.18)	
Occupied (d)$_{i,t}$				0.098			0.338
				(1.43)			(1.20)
Local unemployment rate$_{i,t}$				-4.588			-13.619**
				(-0.56)			(-2.03)
Year-month fixed effects	Yes	Yes	Yes	Yes	No	No	No
Client fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Security-year-month fixed effects	No	No	No	No	Yes	Yes	Yes
Adj. R^2	0.062	0.021	0.022	0.018	0.295	0.295	0.291
N	2,602	2,602	2,558	2,576	3,577	3,509	3,545

Table 11: Local inflation and bond trades

This table presents the results from panel regressions with year-month and client fixed effects. In Columns 1 to 4, the dependent variable is the buy-sell imbalance for bonds of client i in month t. In Columns 5 to 7, the dependent variable is the buy-sell imbalance for bond j of client i in month t. We focus on the time period from January 1920 to September 1923. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the client lives. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for bonds$_{i,t}$				Buy-sell imbalance for individual bonds$_{i,j,t}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local inflation$_{i,t}$	0.085	0.413		0.391	0.836*		1.134**
	(0.21)	(1.11)		(1.01)	(1.98)		(2.22)
Local inflation$_{i,t-1,t}$			0.473			0.759**	
			(1.66)			(2.56)	
Occupied (d)$_{i,t}$				0.579***			-0.147
				(7.84)			(-0.83)
Local unemployment rate$_{i,t}$				1.023			-0.176
				(0.23)			(-0.03)
Year-month fixed effects	Yes	Yes	Yes	Yes	No	No	No
Client fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Security-year-month fixed effects	No	No	No	No	Yes	Yes	Yes
Adj. R^2	0.026	0.065	0.075	0.068	0.424	0.433	0.424
N	4,406	4,406	4,321	4,296	5,191	5,056	5,076

Table 12: Local inflation, dividend payments, and stock trades

This table presents the results from panel regressions with year-month and client fixed effects. In Columns 1 to 4, the dependent variable is the buy-sell imbalance for stocks of client i in month t. In Columns 5 to 7, the dependent variable is the buy-sell imbalance for stock j of client i in month t. We focus on the time period from January 1920 to September 1923. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the client lives. The variable *Dividend (d)* equals one in months in which at least one stock in the client's portfolio pays a dividend, and zero otherwise. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for stocks$_{i,t}$				Buy-sell imbalance for individual stocks$_{i,j,t}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local inflation$_{i,t}$	-0.533**	-0.637**		-0.533*	-0.507***		-0.488**
	(-2.49)	(-2.58)		(-2.02)	(-3.01)		(-2.40)
Local inflation$_{i,t-1,t}$			-0.344**			-0.287**	
			(-2.50)			(-2.20)	
Dividend (d)$_{i,t}$	0.105***	0.121***	0.120***	0.126***	0.075***	0.080***	0.076***
	(4.01)	(7.02)	(6.69)	(5.52)	(4.07)	(4.17)	(4.11)
Local inflation$_{i,t}$ × Dividend (d)$_{i,t}$	-0.060***	-0.061**		-0.065**	-0.043		-0.043
	(-2.88)	(-2.53)		(-2.50)	(-1.26)		(-1.26)
Local inflation$_{i,t-1,t}$ × Dividend (d)$_{i,t}$			-0.035**			-0.027	
			(-2.09)			(-1.30)	
Occupied (d)$_{i,t}$				-0.472*			-0.315
				(-1.93)			(-1.11)
Local unemployment rate$_{i,t}$				-2.224			-7.409**
				(-0.73)			(-2.24)
Year-month fixed effects	Yes	Yes	Yes	Yes	No	No	No
Client fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Security-year-month fixed effects	No	No	No	No	Yes	Yes	Yes
Adj. R^2	0.037	0.037	0.036	0.039	0.331	0.331	0.330
N	8,057	8,057	7,961	7,962	15,189	14,986	15,051

Table 13: Local inflation and trades in securities denominated in foreign currencies

This table presents the results from panel regressions with year-month and client fixed effects. In Columns 1 to 4, the dependent variable is the buy-sell imbalance for securities denominated in foreign currencies of client i in month t. In Columns 5 to 7, the dependent variable is the buy-sell imbalance for security j denominated in foreign currency of client i in month t. We focus on the time period from January 1920 to September 1923. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the client lives. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for foreign exchange$_{i,t}$				Buy-sell imbalance for individual foreign exchange$_{i,j,t}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local inflation$_{i,t}$	-0.301	-0.486		-0.501	-0.937		-0.966
	(-0.50)	(-0.50)		(-0.52)	(-1.12)		(-1.15)
Local inflation$_{i,t-1,t}$			0.214			-0.461	
			(0.30)			(-0.56)	
Occupied (d)$_{i,t}$				-0.645*			0.000
				(-1.97)			(0.00)
Local unemployment rate$_{i,t}$				2.334			6.313
				(0.32)			(0.52)
Year-month fixed effects	Yes	Yes	Yes	Yes	No	No	No
Client fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Security-year-month fixed effects	No	No	No	No	Yes	Yes	Yes
Adj. R^2	0.060	-0.058	-0.062	-0.061	0.194	0.197	0.196
N	1,868	1,868	1,837	1,855	1,550	1,527	1,542

Table 14: Local inflation and stock trades around regulatory changes

This table presents the results from panel regressions with year-month and client fixed effects. The dependent variable is the buy-sell imbalance for stocks of client i in month t. We focus on the time period starting six months prior to each regulatory change and ending six months after each regulatory change. The variable *Local inflation* is the inverse hyperbolic sine of cumulative local inflation of the town where the client lives over the six months preceding each regulatory change. The variable *Post Forex (d)* equals one after Germany restricts trading in foreign exchange (October 1922 onwards), and zero otherwise. The variable *Post housing (d)* equals one after Germany allows landlords to increase housing rents (March 1922 onwards), and zero otherwise. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for $\text{stocks}_{i,t}$	
	(1)	(2)
$\text{Local inflation}_{i,Apr.-Sep.\ 1922} \times \text{Post Forex (d)}_t$	1.032	
	(0.96)	
$\text{Local inflation}_{i,Sep.\ 1921-Feb.\ 1922} \times \text{Post housing (d)}_t$		-0.348
		(-0.55)
Year-month fixed effects	Yes	Yes
Client fixed effects	Yes	Yes
Adj. R^2	0.083	0.029
N	2,212	1,630

Table 15: Instrumental variables regressions

This table presents the second-stage results from two-stage least squares instrumental variables regressions. The dependent variable is the buy-sell imbalance for stocks of client *i* in month *t*. We focus on the time period from January 1920 to September 1923. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the client lives. In Columns 1 and 2, the instrument for local inflation is the fraction of local employees working in the paper industry in 1921. In Columns 3 and 4, the instrument for local inflation is a dummy variable that equals one for towns with an above median fraction of local employees working in the paper industry in 1921, and zero otherwise. We report coefficients on the instruments from the first-stage regression at the bottom of the table. All regressions include the town characteristics *Log(local population)*$_{i,1919}$, *Occupied (d)*$_{i,t}$, *Local unemployment rate*$_{i,t}$, and *German Central Bank (d)*$_{i,1920}$ as control variables. In Columns 2 and 4, we additionally include the client characteristics *Male (d)*$_i$, *Other bank account (d)*$_i$, *Bank employee (d)*$_i$, and *Levered (d)*$_i$ as control variables. Appendix A provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for stocks$_{i,t}$			
	(1)	(2)	(3)	(4)
Local inflation$_{i,t}$	-4.918*	-4.686*	-4.479**	-4.273**
	(-1.86)	(-1.78)	(-2.62)	(-2.61)
First-stage instrument				
% local employees in paper$_{i,1921}$	1.312***	1.307***		
	(3.46)	(3.46)		
High % local employees in paper (d)$_{i,1921}$			0.054***	0.054***
			(3.40)	(3.39)
Year-month fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
Town characteristics	Yes	Yes	Yes	Yes
Client characteristics	No	Yes	No	Yes
N	7,956	7,956	7,956	7,956
F-statistic of first-stage regression	12.199	12.198	11.999	11.939

Figures

Figure 1: Local inflation and stock trades

This figure shows the monthly buy-sell imbalance for stocks for different inflation deciles. We focus on the time period from January 1920 to September 1923. The variable *Local inflation decile* is the local inflation decile of the town where the client lives. Appendix A provides detailed descriptions of all variables used throughout the study. The figure shows point estimates together with 99% confidence intervals.

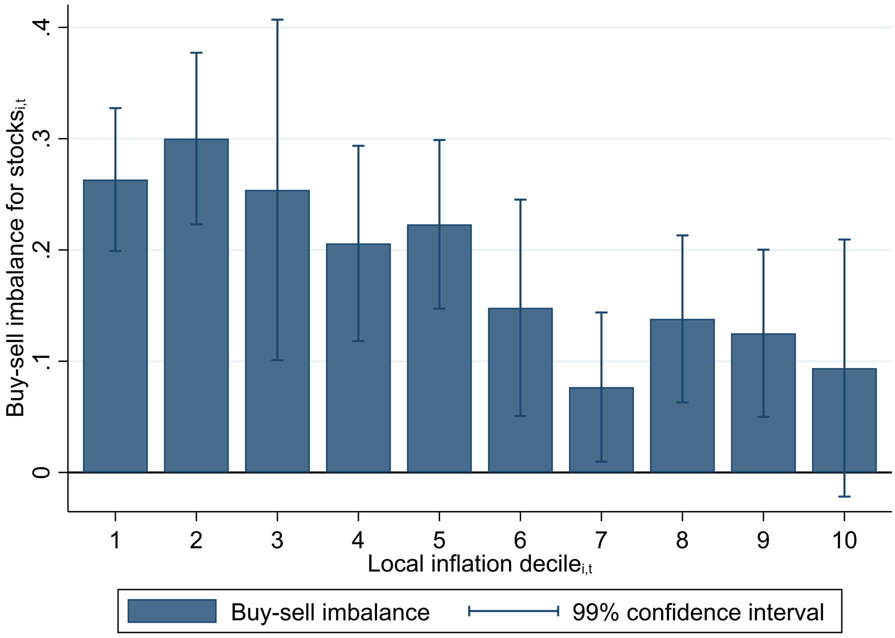


Figure 2: Nominal price development

This figure shows the German consumer price index (CPI), the German stock market index, the dollar/*Mark* exchange rate, the price of one of the most liquid German government bonds, and German real estate prices in nominal terms between February 1920 and September 1923. All time-series are normalized to 1 in February 1920.

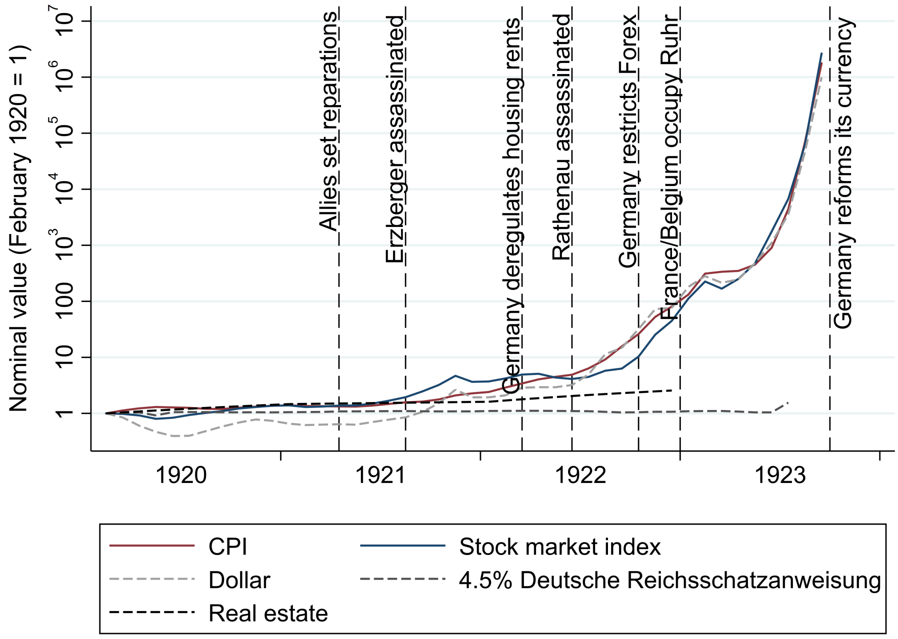


Figure 3: Local inflation

This figure shows the inverse hyperbolic sine of monthly local inflation for towns where at least one client lives or where at least one firm is headquartered between January 1920 and December 1924. Each dot represents the monthly local inflation rate of one town. We assign clients and firms to the closest town for which we have inflation data within a 25 km radius based on the place of residence and the location of headquarters, respectively. Appendix A provides detailed descriptions of all variables used throughout the study.

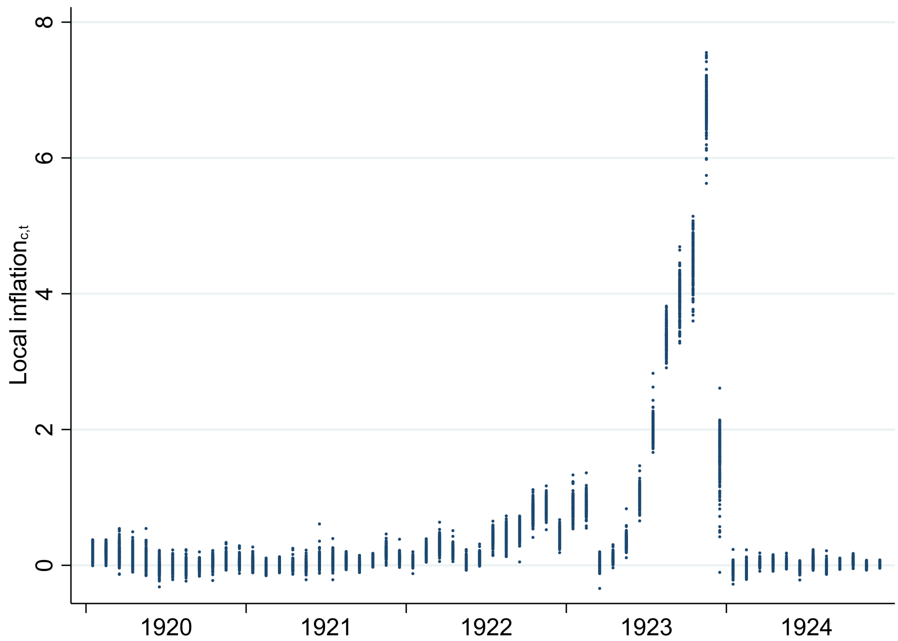
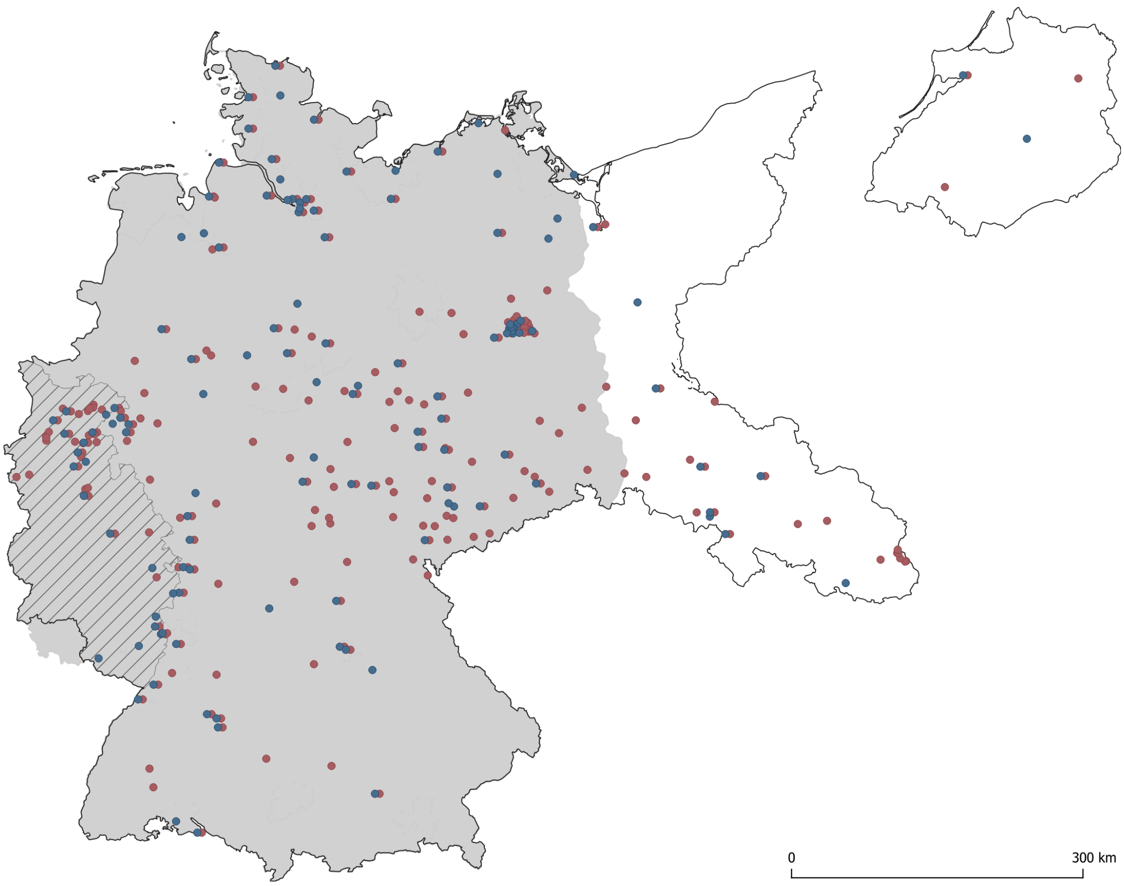


Figure 4: Geographical distribution of clients and firms

This figure shows the locations of the towns where at least one client lives (blue dots) or where at least one firm is headquartered (red dots). We assign clients and firms to the closest town for which we have inflation data within a 25 km radius based on the place of residence and the location of headquarters, respectively. The map shows Germany as of 1920, the area occupied by France and Belgium (shaded), and Germany as of today (grey). The map of Germany from 1920 is from the Max Planck Institute for Demographic Research (MPIDR, 2011) and the map of contemporary Germany from the Federal Agency for Cartography and Geodesy (FACG, 2011).



Appendix A: Variable descriptions

Variable	Description
Client characteristics	
Male (d)	Dummy variable that equals one for male clients and zero for female clients; we assume clients to be male if the gender is not explicitly specified
Germany (d)	Dummy variable that equals one for clients who live in Germany, and zero otherwise
Europe (d)	Dummy variable that equals one for clients who live in Europe, and zero otherwise
Other bank account (d)	Dummy variable that equals one for clients who report to have an account at another bank, and zero otherwise
Bank employee (d)	Dummy variable that equals one for clients who are employees of the bank, and zero otherwise
Portfolio characteristics	
# securities	Number of different securities in the client's portfolio at the end of the month
# stocks	Number of different stocks denominated in *Mark* in the client's portfolio at the end of the month
# bonds	Number of different bonds denominated in *Mark* in the client's portfolio at the end of the month
# foreign exchange	Number of different securities denominated in foreign currencies in the client's portfolio at the end of the month
% stocks	$\frac{\#\ stocks}{\#\ securities}$
% bonds	$\frac{\#\ bonds}{\#\ securities}$
% foreign exchange	$\frac{\#\ foreign\ exchange}{\#\ securities}$
Wealthy (d)	Dummy variable that equals one for clients with above median portfolio market value in January 1920 and zero for clients with below median portfolio market value in January 1920
Diversified (d)	Dummy variable that equals one for clients with above median number of different stocks in the portfolio in January 1920 and zero for clients with below median number of different stocks in the portfolio in January 1920
Levered (d)	Dummy variable that equals one for clients with a levered portfolio, and zero otherwise
Trade characteristics	
# trades per month	Number of trades in the client's portfolio per month
# buys	Number of buys in the client's portfolio per month; we classify all portfolio inflows as buys and all portfolio outflows as sells
# stock trades	Number of trades in stocks denominated in *Mark* in the client's portfolio per month
# bond trades	Number of trades in bonds denominated in *Mark* in the client's portfolio per month
# foreign exchange trades	Number of trades in securities denominated in foreign currencies in the client's portfolio per month

% buys	$\frac{\# \, buys}{\# \, trades \; per \; month}$
% stock trades	$\frac{\# \, stock \; trades}{\# \, trades \; per \; month}$
% bond trades	$\frac{\# \, bond \; trades}{\# \, trades \; per \; month}$
% foreign exchange trades	$\frac{\# \, foreign \; exchange \; trades}{\# \, trades \; per \; month}$
Buy-sell imbalance for stocks	$\frac{\# \, stock \; buys \; per \; month - \# \, stock \; sells \; per \; month}{\# \, stock \; buys \; per \; month + \# \, stock \; sells \; per \; month}$
Buy-sell imbalance for bonds	$\frac{\# \, bond \; buys \; per \; month - \# \, bond \; sells \; per \; month}{\# \, bond \; buys \; per \; month + \# \, bond \; sells \; per \; month}$
Buy-sell imbalance for foreign exchange	$\frac{\# \, foreign \; exchange \; buys \; per \; month - \# \, foreign \; exchange \; sells \; per \; month}{\# \, foreign \; exchange \; buys \; per \; month + \# \, foreign \; exchange \; sells \; per \; month}$
Firm characteristics	
% nominal liabilities	$\frac{Total \; assets \; at \; the \; end \; of \; the \; last \; fiscal \; year - Equity \; at \; the \; end \; of \; the \; last \; fiscal \; year}{Total \; assets \; at \; the \; end \; of \; the \; last \; fiscal \; year}$
% nominal assets	$\frac{Nominal \; assets \; at \; the \; end \; of \; the \; last \; fiscal \; year}{Total \; assets \; at \; the \; end \; of \; the \; last \; fiscal \; year}$
Net leverage	$\% \, nominal \; liabilities - \% \, nominal \; assets$
Δ Net leverage	$Net \; leverage \; at \; the \; end \; of \; the \; last \; fiscal \; year -$ $Net \; leverage \; at \; the \; end \; of \; the \; second \; to \; last \; fiscal \; year$
Assets	Total assets at the end of the last fiscal year
Log(assets)	$Ln(assets + 1)$
Profitability	$\frac{Profit \; or \; loss \; in \; the \; last \; fiscal \; year}{Total \; assets \; at \; the \; end \; of \; the \; last \; fiscal \; year}$
Nominal stock return	$\frac{Stock \; price \; at \; the \; end \; of \; the \; current \; month}{Stock \; price \; at \; the \; end \; of \; the \; previous \; month} - 1$; we winsorize nominal stock returns at the 1% level and the 99% level
Real stock return	$\frac{1 + Nominal \; stock \; return}{1 + National \; inflation} - 1$; we winsorize real stock returns at the 1% level and the 99% level
Dividend (d)	Dummy variable that equals one in months in which at least one stock in the client's portfolio pays a dividend, and zero otherwise
Local inflation	
Raw local inflation	$\frac{Local \; consumer \; price \; index \; at \; the \; end \; of \; the \; current \; month}{Local \; consumer \; price \; index \; at \; the \; end \; of \; the \; previous \; month} - 1$; we winsorize inflation at the 1% level and the 99% level
Local inflation	$Ln(raw \; local \; inflation + \sqrt{raw \; local \; inflation^2 + 1})$ (inverse hyperbolic sine)
Log(local inflation)	$Ln(raw \; local \; inflation + 1)$; we set inflation to zero in months with negative inflation
Local inflation decile	Towns are sorted into deciles each month based on their monthly local inflation
Town characteristics	
Log(local population)	$Ln(local \; \# \; inhabitants \; according \; to \; the \; census \; in \; October \; 1919 + 1)$
Occupied (d)	Dummy variable that equals one for towns occupied by France or Belgium, and zero otherwise
Local unemployment rate	$\frac{Local \; \# \; unemployed \; at \; the \; end \; of \; the \; month}{Local \; \# \; inhabitants \; according \; to \; the \; census \; in \; October \; 1919}$; we impute the unemployment rate by using the past unemployment rate of the town or the current unemployment rate of the state in which the town is located
German Central Bank (d)	Dummy variable that equals one for towns with a branch of the German Central Bank, and zero otherwise

% local employees in paper	$\frac{Local\ \#\ employees\ working\ in\ the\ paper\ industry\ in\ 1921}{Local\ \#\ employees\ in\ 1921}$
Major events and regulatory changes	
Post reparations (d)	Dummy variable that equals one after the Allies set the reparations to be paid by Germany (May 1921 onwards), and zero otherwise
Post Erzberger (d)	Dummy variable that equals one after the assassination of the German finance minister Matthias Erzberger (August 1921 onwards), and zero otherwise
Post housing (d)	Dummy variable that equals one after Germany allows landlords to increase housing rents (March 1922 onwards), and zero otherwise
Post Rathenau (d)	Dummy variable that equals one after the assassination of the German foreign minister Walther Rathenau (June 1922 onwards), and zero otherwise
Post Forex (d)	Dummy variable that equals one after Germany restricts trading in foreign exchange (October 1922 onwards), and zero otherwise
Post Ruhr (d)	Dummy variable that equals one after France and Belgium occupy the Ruhr region (January 1923 onwards), and zero otherwise
Post reform (d)	Dummy variable that equals one after Germany reforms its currency (October 1923 onwards), and zero otherwise

Internet Appendix to
"Inflation and Individual Investors' Behavior: Evidence from the German Hyperinflation"

Abstract

The Internet Appendix consists of two sections. Internet Appendix A contains additional tables and figures. In Internet Appendix B, we discuss the results of tests reported in Table IA1.

Internet Appendix A: Tables and Figures

Table IA1: Local inflation and stock trades – Robustness tests

This table presents the results from panel regressions with year-month and client fixed effects. The dependent variable is either the buy-sell imbalance for stocks of client i in month t (Columns 1 to 3), the buy-sell imbalance for stocks of client i in month t set to zero in months without any transactions (Column 4), the buy-sell imbalance for stocks of client i in month t based on the value of stock trades (in face value terms) (Column 5), or the natural logarithm of the portfolio face value of stocks of client i at the end of month t (Column 6). We focus on the time period from January 1920 to September 1923. The variable *Raw local inflation* is the local inflation of the town where the client lives winsorized at the 1% level and the 99% level. The variable *Log(local inflation)* is the natural logarithm of local inflation of the town where the client lives set to zero in months with negative inflation. The variable *Local inflation decile* is the local inflation decile of the town where the client lives. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the client lives. Appendix A in the main paper provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for stocks$_{i,t}$			Buy-sell imbalance for stocks$_{i,t}$ (set to zero in months with no trades)	Buy-sell imbalance for stocks$_{i,t}$ (based on value of trades)	Log(portfolio face value of stocks)$_{i,t}$
	(1)	(2)	(3)	(4)	(5)	(6)
Raw local inflation$_{i,t}$	-0.024***					
	(-3.07)					
Log(local inflation)$_{i,t}$		-0.770**				
		(-2.64)				
Local inflation decile$_{i,t}$			-0.017**			
			(-2.39)			
Local inflation$_{i,t}$				-0.137**	-0.591**	-0.731***
				(-2.49)	(-2.60)	(-3.05)
Year-month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Client fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.035	0.036	0.036	0.019	0.025	0.666
N	8,057	8,057	8,057	36,175	8,057	36,175

Table IA2: Weekly local inflation and stock trades

This table presents the results from panel regressions with year-month-week and client fixed effects. The dependent variable is the buy-sell imbalance for stocks of client *i* in week *t*. We focus on the time period from July 12, 1923 to October 15, 1923. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the client lives. Appendix A in the main paper provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and week level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for stocks$_{i,t}$	
	(1)	(2)
Local inflation$_{i,t}$	-0.622	-1.306*
	(-1.46)	(-2.34)
Local inflation$_{i,t-1}$	-0.177	-2.203
	(-0.16)	(-1.74)
Local inflation$_{i,t-2}$	-0.064	-1.606**
	(-0.13)	(-3.40)
Local inflation$_{i,t-3}$	-0.254	-3.049**
	(-0.19)	(-3.11)
Local inflation$_{i,t-4}$	-0.129	-3.643*
	(-0.22)	(-1.96)
Local inflation$_{i,t-5}$	0.278	-1.116*
	(0.20)	(-2.06)
Local inflation$_{i,t-6}$	-0.160	-0.515
	(-0.25)	(-0.61)
Local inflation$_{i,t-7}$	1.258	-1.177
	(1.34)	(-0.80)
Year-month-week fixed effects	Yes	Yes
Client fixed effects	No	Yes
Adj. R^2	0.008	0.141
N	831	831

Table IA3: Local inflation and stock trades of institutional clients

This table presents the results from panel regressions with year-month and client fixed effects. The dependent variable is the buy-sell imbalance for stocks of client i in month t. We focus on the time period from January 1920 to September 1923. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the institutional client is located. Appendix A in the main paper provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Buy-sell imbalance for stocks$_{i,t}$			
	(1)	(2)	(3)	(4)
Local inflation$_{i,t}$	0.139	0.328*		0.281
	(0.49)	(1.82)		(1.54)
Local inflation$_{i,t-1,t}$			0.476*	
			(1.69)	
Occupied (d)$_{i,t}$				0.228
				(1.54)
Local unemployment rate$_{i,t}$				3.469
				(0.60)
Year-month fixed effects	Yes	Yes	Yes	Yes
Client fixed effects	No	Yes	Yes	Yes
Adj. R^2	0.040	0.098	0.095	0.107
N	1,081	1,081	1,071	1,058

Table IA4: Local inflation and trades in short-term and long-term bonds

This table presents the results from panel regressions with year-month, client, and security-year-month fixed effects. In Columns 1 to 4, the dependent variable is the buy-sell imbalance for bonds of client i in month t. In Columns 5 to 7, the dependent variable is the buy-sell imbalance for bond j of client i in month t. In Panel A (Panel B), we restrict the sample to trades in short-term German government bonds (other bonds). We focus on the time period from January 1920 to September 1923. The variable *Local inflation* is the inverse hyperbolic sine of local inflation of the town where the client lives. Appendix A in the main paper provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the town and month level. t-statistics are provided in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Short-term German government bonds

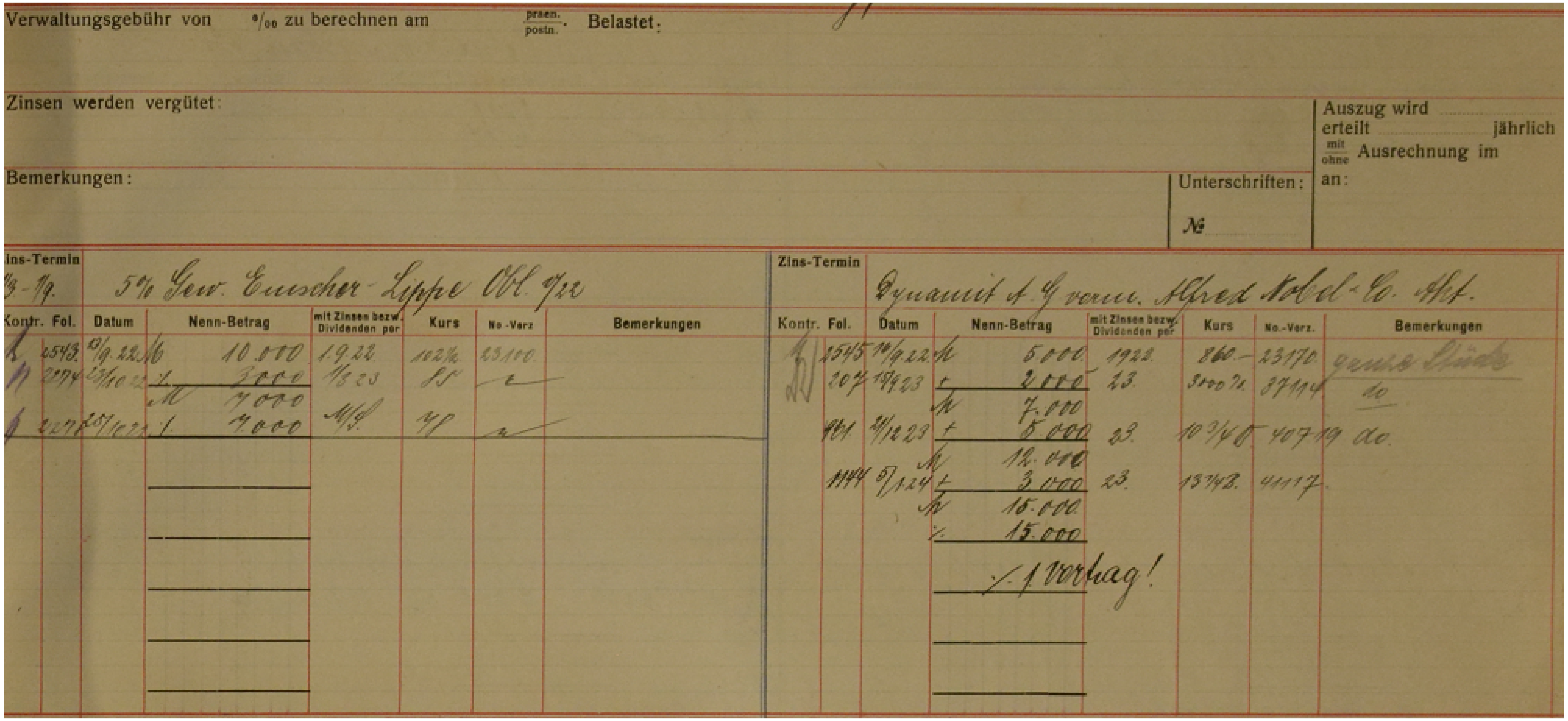
	Buy-sell imbalance for short-term bonds$_{i,t}$				Buy-sell imbalance for individual short-term bonds$_{i,j,t}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local inflation$_{i,t}$	-0.156	-0.074		0.188	0.028		0.268
	(-0.51)	(-0.26)		(0.49)	(0.10)		(0.74)
Local inflation$_{i,t-1,t}$			0.407			0.350	
			(1.55)			(1.34)	
Occupied (d)$_{i,t}$				0.503*			0.844*
				(2.05)			(1.76)
Local unemployment rate$_{i,t}$				-1.387			1.158
				(-0.16)			(0.14)
Year-month fixed effects	Yes	Yes	Yes	Yes	No	No	No
Client fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Security-year-month fixed effects	No	No	No	No	Yes	Yes	Yes
Adj. R^2	0.071	0.020	0.026	0.017	0.116	0.116	0.116
N	2,060	2,060	2,041	1,998	3,178	3,144	3,115

Panel B: Other bonds

	Buy-sell imbalance for other bonds$_{i,t}$				Buy-sell imbalance for individual other bonds$_{i,j,t}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local inflation$_{i,t}$	0.218	0.483		0.405	1.893**		2.047**
	(0.40)	(0.90)		(0.78)	(2.41)		(2.52)
Local inflation$_{i,t-1,t}$			0.335			1.067	
			(0.99)			(1.55)	
Occupied (d)$_{i,t}$				0.657***			-0.256
				(6.39)			(-0.88)
Local unemployment rate$_{i,t}$				2.598			4.613
				(0.49)			(0.52)
Year-month fixed effects	Yes	Yes	Yes	Yes	No	No	No
Client fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Security-year-month fixed effects	No	No	No	No	Yes	Yes	Yes
Adj. R^2	0.062	0.074	0.083	0.077	0.310	0.304	0.302
N	2,569	2,569	2,500	2,521	3,865	3,758	3,809

Figure IA1: Sample page from the deposit books

This figure shows a sample page from the deposit books.



Verwaltungsgebühr von ‰ zu berechnen am praen./postn. Belastet:

Zinsen werden vergütet:

Auszug wird erteilt jährlich mit/ohne Ausrechnung im an:

Bemerkungen:

Unterschriften: №

Zins-Termin 3-9 — 5% Gew. Emscher Lippe Obl. 7/22

Kontr.	Fol.	Datum	Nenn-Betrag	mit Zinsen bezw. Dividenden per	Kurs	No.-Verz.	Bemerkungen
	1543	13/9.22	M 10.000	1.9.22	102½	23100	
	2174	23/10.22	./. 3000	1/3 23	85	"	
			M 7000				
	2247	25/10.22	./. 7000	M/S	78	"	

Zins-Termin — Dynamit A.G. vorm. Alfred Nobel & Co. Akt.

Kontr.	Fol.	Datum	Nenn-Betrag	mit Zinsen bezw. Dividenden per	Kurs	No.-Verz.	Bemerkungen
	2545	16/9.22	M 5.000	1922	860.–	23170	ganze Stücke
	2074	1/4 23	+ 2.000	23	3000%	37114	do
			M 7.000				
	961	4/12 23	+ 5.000	23	10¾	40719	do.
			M 12.000				
	1144	5/1 24	+ 3.000	23	13¾ B.	41117	
			M 15.000				
			./. 15.000				
			./. 1 Vortrag!				

Figure IA2: Sample page from the Handbook of German Stock Corporations

This figure shows a sample page from the Handbook of German Stock Corporations.

Berlin-Burger Eisenwerk, Aktiengesellschaft Berlin W. 8.

Friedrichstr. 77.

Gegründet: 30./7. bzw. 30./10. 1913; eingetr. 8./11. 1913. (Firma bis 13./5. 1916: Herdkessel-Industrie, Akt.-Ges.) Gründer: Apparatebau & Herdkessel-Industrie Karl Alt u. Paul Jerome in Strassburg mit Zweigniederlass. in B.-Schöneberg; Aug. Rolf, Ernst Leipziger, B.-Schöneberg; Dir. Paul Meerettig, Ing. Walter Schöning, B.-Niederschönhausen.

Zweck: Anfänglich Fabrikation u. Vertrieb von Herdkesseln, Heizungsanlagen und sanitären Einrichtungen und Verwertung der der Firma Alt & Jerome zu Strassburg i. Els. erteilten Patente u. Gebrauchsmuster. Der Gegenstand des Unternehmens ist aldann erweitert auf Herstellung u. Vertrieb von Erzeugnissen der Eisen-, Stahl- u. Metallindustrie u. verwandter Fabrikationszweige. Eisen- u. Stahlwerk. Maschinenfabrik u. Lokomotiv-Reparaturwerkstatt in Burg b. Magdeburg. Die Ges. erwarb am 15./7. 1918 die Berliner Maschinenfabrik der Firma Max Kray & Co. A.-G., Böckhstr. 7. Der Fabrikationsbetrieb hier ist nach der politischen Umwälzung aufgelöst worden. Die Räume dienen als Lager. Die Ges. beteiligte sich mit M. 100 000 bei der Mitteldeutschen Eisen- u. Metallgesellschaft G. m. b. H. Berlin, die den Vertrieb von Heizkesseln. gusseisernen Radiatoren u. Zubehörteilen inne hat. Die Ges. erwarb 1920 die Aktien-Majoritäten der Fa. Gebr. Schöndorff A.-G. Waggonfabrik in Düsseldorf u. L. Georg Bierling & Co. A.-G. Metallwaren- u. Blechemballagenfabrik in Mügeln bei Dresden. Die Ges. kaufte weiterhin die Maschinenfabrik S. Aston in Burg b. Magdeburg unter Umwandlung derselben in eine Kommanditges. Die Interessengemeinschaft mit der Gebr. Schöndorff Akt.-Ges. ist wieder aufgehoben, andrerseits hat das Werk Interesse genommen an der Hermann Kramer & Co, Komm.-Ges. Danzig, der Bayer. Eisenhandelsges. Ehmer & Co. Komm.-Ges., München, u. der Sächs. Eisenhandelsges. Schaal & Co. Komm.-Ges. Chemnitz.

Kapital: M. 30 000 000 in 30 000 Aktien à M. 1000. Urspr. M. 250 000. Erhöht lt. G.-V. v. 13./5. 1916 um M. 450 000 behufs Übernahme des Burger Eisenwerkes von E. Angrick. Die G.-V. v. 11./1. 1918 beschloss die Erhöh. des A.-K. um M. 1 300 000 (also auf M. 2 000 000) in 1300 Aktien mit Div.-Ber. ab 1./10. 1917. Das gesamte Erhöh.-Kap. ist von einem Konsort. unter Führung des Bankhauses C. H. Kretzschmar, Berlin, übernommen worden, u. zwar M. 800 000 zu 107%, die restl. M. 500 000 lt. G.-V. v. 4./5. 1918 zu 130%. Das erzielte Agio nach Abzug sämtlicher Erhöh.-Unk. wurde mit ca. M. 100 000 dem R.-F. zugeführt. Weitere Kap.-Erhöh. lt. G.-V. v. 30./12 1919 um M. 3 000 000 mit Div.-Ber. ab 1./10. 1919, übernommen von C. H. Kretzschmar zu 107%. Lt. G.-V v. 12./6. 1920 ist das Kapital um M. 20 000 000 auf M. 25 000 000 mit Div.-Ber. ab 1./4. 1920 erhöht worden. Mitte 1921 erfolgte die vollständige Angliederung der L. Georg Bierling & Co. Akt.-Ges. in Heidenau (A.-K. M. 5 000 000), zu welchem Zweck die a.o. G.-V. v. 8./8. 1921 die Erhöh. des A.-K. um M. 5 000 000, also auf M. 30 000 000 beschluss.

Hypotheken: M. 392 310.

Geschäftsjahr: 1./10.—30./9. **Gen.-Vers.:** Im I. Geschäftshalbj.

Bilanz am 30. Sept. 1920: Aktiva: Grundstücke u. Wohnhäuser 1 088 609, Fabrikgebäude Burg 683 477, Gleisanlagen 66 271, Arb.-Wohnhäuser-Beteilig. Burg 1, Masch. u. Werkzeuge 537 631, Geräte u. Utensil. 422 504, Öfen 1. Generator 1, Kohlenbunker 1, Kessel u. Dampfmasch. 1, elektr. Anlage 1, Laborat.-Einricht. 1, Modelle 1, Patente 1, Mobil. 1, Fahrzeuge 143 744, Abt. Munit- u. Mat.-Verwert.: Einricht. Burg. Gerwisch, Jüterbog u. Kelsterbach 790 971, Kassa 41 690, Effekten 535 001, Kaut. 536 280, Beteilig. 674 000. Waren 22 036 183, Debit. 27 991 702, Bankguth. 12 613 321. — Passiva: A.-K. 5 000 000, R.-F. 384 083 (Rückl. 216 796), Hypoth. 392 310, unerhob. Div. 14 940, Interims-Kto 2 175 724, Kredit. 38 277 168, Vorauszahl. 10 388 487, Konsort.-Kto Kelsterbach: Beteilig. der Dynamit A.-G. vorm. Alfred Nobel & Co., Hamburg 7 104 145, Werkerhalt.-Kto 1 000 000, 10% Div. auf M. 5 000 000 500 000, 5% do. auf M. 25 000 000 1 000 000, Bonus 10 bezw. 5% 1 500 000, Vortrag 419 538. Sa. M. 68 156 398.

Gewinn- u. Verlust-Konto: Debet: Handl.-Unk. 6 666 228, Abschreib. 5 504 437, Gewinn 3 636 335. — Kredit: Vortrag 63 750, Gewinn aus Beteilig. 80 000, Rohgewinn 15 663 250. Sa. M. 15 807 000.

Dividenden: 1913/14—1919/20: 0, 6, 0, 0, 0, 6, 10 + 10% Bonus (j. A. 5 + 5%).

Prokuristen: Dr. Wilh. Adler, Fritz Heilgendorff, Berlin; Ing. Albert Raden, Hugo Schuberth, Otto Tietz, Burg b. Magdeburg.

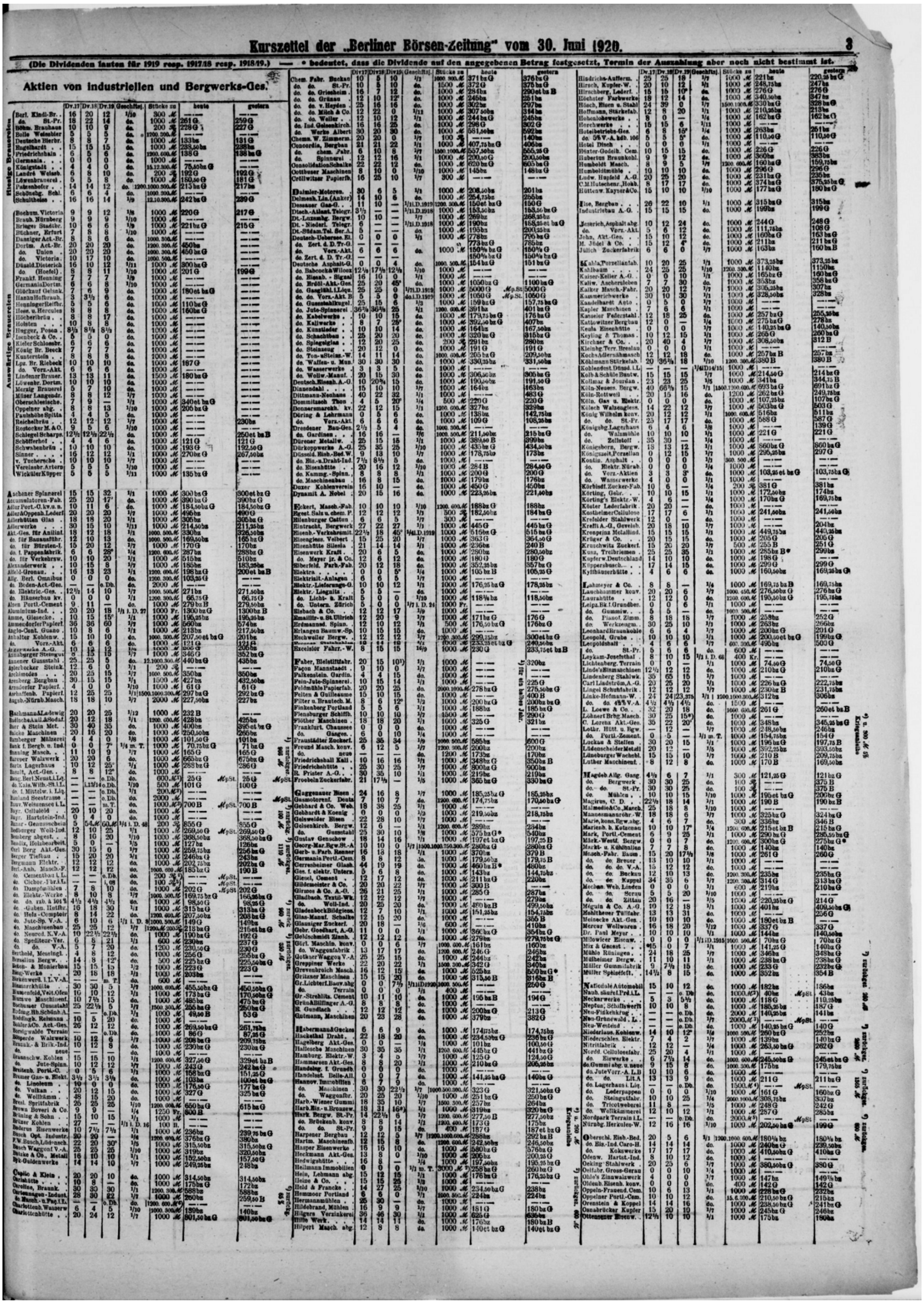
Direktion: Aug. Rolf, Ernst Leipziger; Stellv. Felix Painta, Theodor Land.

Aufsichtsrat: Vors. Ing. Ernst Angrick, Berlin-Lichterfelde; Rechtsanwalt Hugo Staub, Berlin; Konsul Dr. jur. Carl Piekenbrock, Essen; General a. D. Freih. v. Wachtmeister, Berlin; Ziviling. Gust. Berthold, Düsseldorf; Kaufm. Wilh. Heermann, Heilbronn; Bankdir. Eugen Bandel, Barmen; Senator Jul. Jewelowsky, Danzig; Bankdir. Wilh. Kleemann, Berlin; Gen.-Dir. Prof Ludwig Noé, Danzig; Bankdir. Paul Schmidt-Branden, Berlin; Dir. Otto Windgassen, Düsseldorf.

Zahlstellen: Berlin: Ges.-Kasse, Dresdner Bank, C. H. Kretzschmar; Düsseldorf: Barmer Bankverein, Hinsberg Fischer & Co.

Figure IA3: Sample page from the Berlin Stock Exchange Newspaper

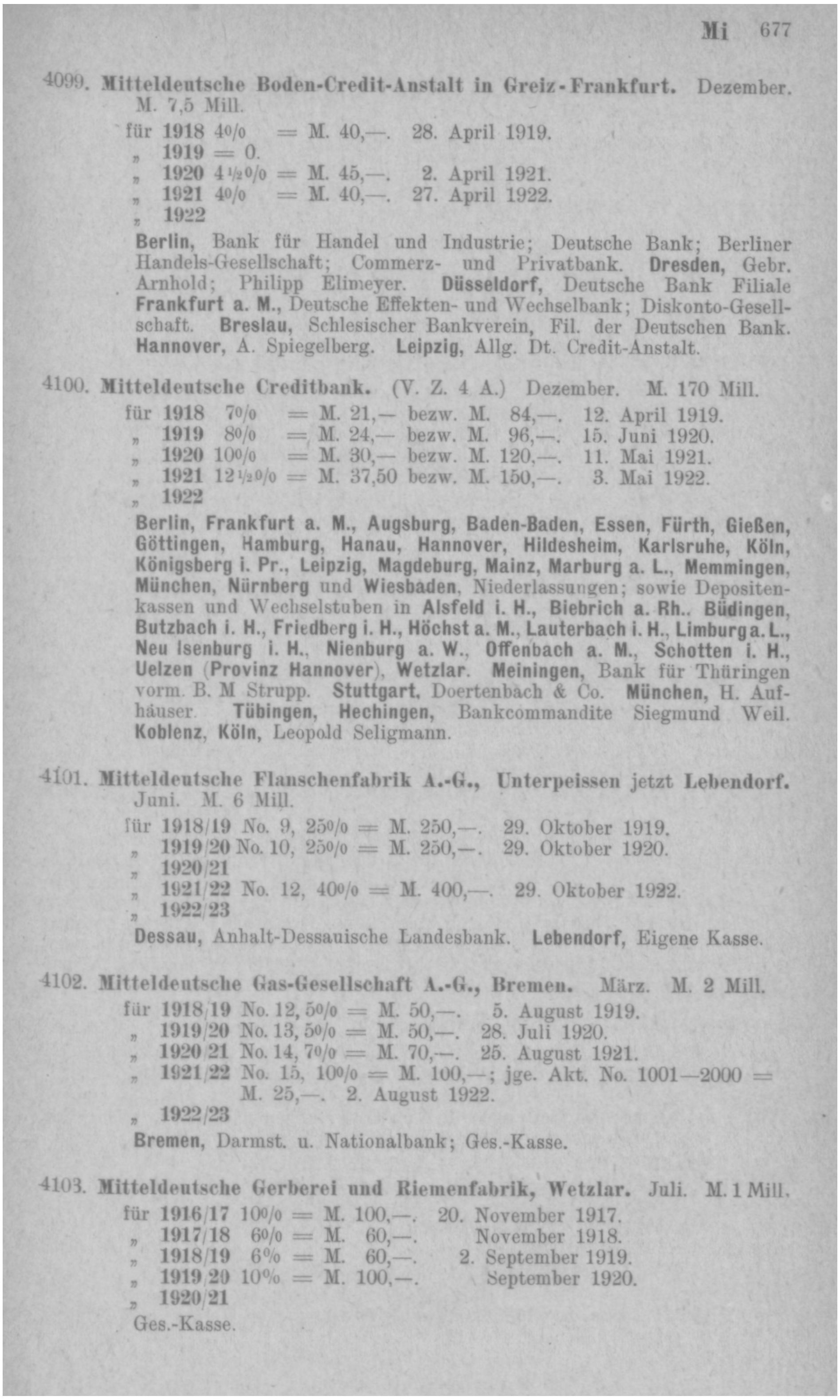
This figure shows a sample page from the Berlin Stock Exchange Newspaper.


Kurszettel der „Berliner Börsen-Zeitung" vom 30. Juni 1920. 3

Aktien von Industriellen und Bergwerks-Ges.

Figure IA4: Sample page from The Coupon

This figure shows a sample page from The Coupon.



Mi 677

4099. **Mitteldeutsche Boden-Credit-Anstalt in Greiz-Frankfurt.** Dezember. M. 7,5 Mill.

für **1918** 4% = M. 40,—. 28. April 1919.
„ **1919** = 0.
„ **1920** 4½% = M. 45,—. 2. April 1921.
„ **1921** 4% = M. 40,—. 27. April 1922.
„ **1922**

Berlin, Bank für Handel und Industrie; Deutsche Bank; Berliner Handels-Gesellschaft; Commerz- und Privatbank. **Dresden,** Gebr. Arnhold; Philipp Elimeyer. **Düsseldorf,** Deutsche Bank Filiale **Frankfurt a. M.,** Deutsche Effekten- und Wechselbank; Diskonto-Gesellschaft. **Breslau,** Schlesischer Bankverein, Fil. der Deutschen Bank. **Hannover,** A. Spiegelberg. **Leipzig,** Allg. Dt. Credit-Anstalt.

4100. **Mitteldeutsche Creditbank.** (V. Z. 4 A.) Dezember. M. 170 Mill.

für **1918** 7% = M. 21,— bezw. M. 84,—. 12. April 1919.
„ **1919** 8% = M. 24,— bezw. M. 96,—. 15. Juni 1920.
„ **1920** 10% = M. 30,— bezw. M. 120,—. 11. Mai 1921.
„ **1921** 12½% = M. 37,50 bezw. M. 150,—. 3. Mai 1922.
„ **1922**

Berlin, Frankfurt a. M., Augsburg, Baden-Baden, Essen, Fürth, Gießen, Göttingen, Hamburg, Hanau, Hannover, Hildesheim, Karlsruhe, Köln, Königsberg i. Pr., Leipzig, Magdeburg, Mainz, Marburg a. L., Memmingen, München, Nürnberg und **Wiesbaden,** Niederlassungen; sowie Depositenkassen und Wechselstuben in **Alsfeld i. H., Biebrich a. Rh., Büdingen, Butzbach i. H., Friedberg i. H., Höchst a. M., Lauterbach i. H., Limburg a. L., Neu Isenburg i. H., Nienburg a. W., Offenbach a. M., Schotten i. H., Uelzen (Provinz Hannover), Wetzlar. Meiningen,** Bank für Thüringen vorm. B. M Strupp. **Stuttgart,** Doertenbach & Co. **München,** H. Aufhäuser. **Tübingen, Hechingen,** Bankcommandite Siegmund Weil. **Koblenz, Köln,** Leopold Seligmann.

4101. **Mitteldeutsche Flanschenfabrik A.-G., Unterpeissen jetzt Lebendorf.** Juni. M. 6 Mill.

für **1918/19** No. 9, 25% = M. 250,—. 29. Oktober 1919.
„ **1919/20** No. 10, 25% = M. 250,—. 29. Oktober 1920.
„ **1920/21**
„ **1921/22** No. 12, 40% = M. 400,—. 29. Oktober 1922.
„ **1922/23**

Dessau, Anhalt-Dessauische Landesbank. **Lebendorf,** Eigene Kasse.

4102. **Mitteldeutsche Gas-Gesellschaft A.-G., Bremen.** März. M. 2 Mill.

für **1918/19** No. 12, 5% = M. 50,—. 5. August 1919.
„ **1919/20** No. 13, 5% = M. 50,—. 28. Juli 1920.
„ **1920/21** No. 14, 7% = M. 70,—. 25. August 1921.
„ **1921/22** No. 15, 10% = M. 100,—; jge. Akt. No. 1001—2000 = M. 25,—. 2. August 1922.
„ **1922/23**

Bremen, Darmst. u. Nationalbank; Ges.-Kasse.

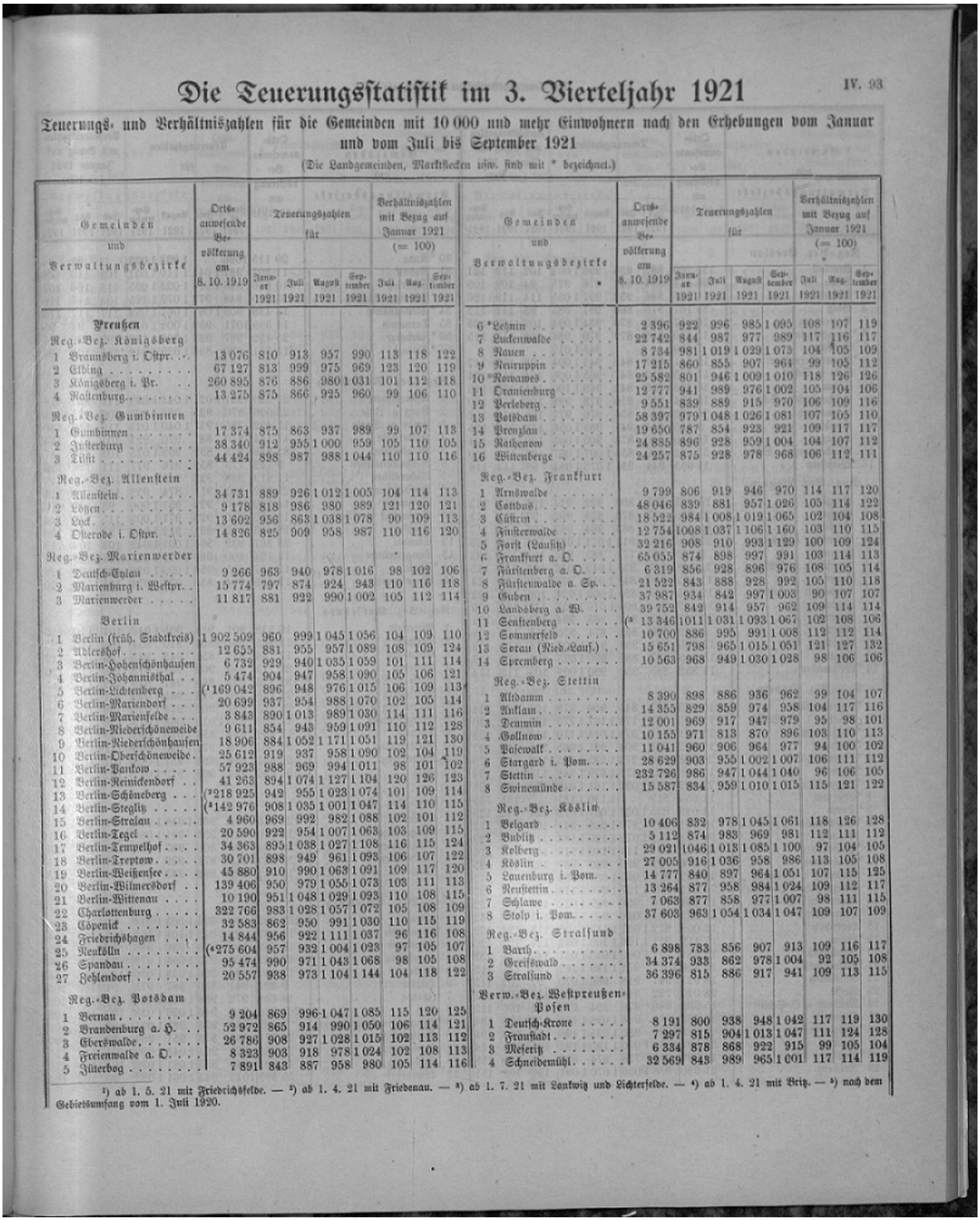
4103. **Mitteldeutsche Gerberei und Riemenfabrik, Wetzlar.** Juli. M. 1 Mill.

für **1916/17** 10% = M. 100,—. 20. November 1917.
„ **1917/18** 6% = M. 60,—. November 1918.
„ **1918/19** 6% = M. 60,—. 2. September 1919.
„ **1919/20** 10% = M. 100,—. September 1920.
„ **1920/21**

Ges.-Kasse.

Figure IA5: Sample page from the Quarterly Issue of the German Statistical Office

This figure shows a sample page from the Quarterly Issue of the German Statistical Office.



Die Teuerungsstatistik im 3. Vierteljahr 1921

Teuerungs- und Verhältniszahlen für die Gemeinden mit 10 000 und mehr Einwohnern nach den Erhebungen vom Januar und vom Juli bis September 1921

(Die Landgemeinden, Marktflecken usw. sind mit * bezeichnet.)

Gemeinden und Verwaltungsbezirke	Ortsanwesende Bevölkerung am 8. 10. 1919	Teuerungszahlen für				Verhältniszahlen mit Bezug auf Januar 1921 (= 100)		
		Januar 1921	Juli 1921	August 1921	September 1921	Juli 1921	Aug. 1921	September 1921
Preußen								
Reg.-Bez. Königsberg								
1 Braunsberg i. Ostpr.	13 076	810	913	957	990	113	118	122
2 Elbing	67 127	813	999	975	969	123	120	119
3 Königsberg i. Pr.	260 895	876	886	980	1 031	101	112	118
4 Rastenburg	13 275	875	866	925	960	99	106	110
Reg.-Bez. Gumbinnen								
1 Gumbinnen	17 374	875	863	937	989	99	107	113
2 Insterburg	38 340	912	955	1 000	959	105	110	105
3 Tilsit	44 424	898	987	988	1 044	110	110	116
Reg.-Bez. Allenstein								
1 Allenstein	34 731	889	926	1 012	1 005	104	114	113
2 Lötzen	9 178	818	986	980	989	121	120	121
3 Lyck	13 602	956	863	1 038	1 078	90	109	113
4 Osterode i. Ostpr.	14 826	825	909	958	987	110	116	120
Reg.-Bez. Marienwerder								
1 Deutsch-Eylau	9 266	963	940	978	1 016	98	102	106
2 Marienburg i. Westpr.	15 774	797	874	924	943	110	116	118
3 Marienwerder	11 817	881	922	990	1 002	105	112	114
Berlin								
1 Berlin (früh. Stadtkreis)	1 902 509	960	999	1 045	1 056	104	109	110
2 Adlershof	12 655	881	955	957	1 089	108	109	124
3 Berlin-Hohenschönhausen	6 732	929	940	1 035	1 059	101	111	114
4 Berlin-Johannisthal	5 474	904	947	958	1 090	105	106	121
5 Berlin-Lichtenberg	(1) 169 042	896	948	976	1 015	106	109	113
6 Berlin-Mariendorf	20 699	937	954	988	1 070	102	105	114
7 Berlin-Marienfelde	3 843	890	1 013	989	1 030	114	111	116
8 Berlin-Niederschöneweide	9 611	854	943	959	1 091	110	112	128
9 Berlin-Niederschönhausen	18 906	884	1 052	1 171	1 051	119	121	130
10 Berlin-Oberschöneweide	25 612	919	937	958	1 090	102	104	119
11 Berlin-Pankow	57 923	988	969	994	1 011	98	101	102
12 Berlin-Reinickendorf	41 263	894	1 074	1 127	1 104	120	126	123
13 Berlin-Schöneberg	(2) 218 925	942	955	1 023	1 074	101	109	114
14 Berlin-Steglitz	(3) 142 976	908	1 035	1 001	1 047	114	110	115
15 Berlin-Stralau	4 960	969	992	982	1 088	102	101	112
16 Berlin-Tegel	20 590	922	954	1 007	1 063	103	109	115
17 Berlin-Tempelhof	34 363	895	1 038	1 027	1 108	116	115	124
18 Berlin-Treptow	30 701	898	949	961	1 093	106	107	122
19 Berlin-Weißensee	45 880	910	990	1 063	1 091	109	117	120
20 Berlin-Wilmersdorf	139 406	950	979	1 055	1 073	103	111	113
21 Berlin-Wittenau	10 190	951	1 048	1 029	1 093	110	108	115
22 Charlottenburg	322 766	983	1 028	1 057	1 072	105	108	109
23 Cöpenick	32 583	862	950	991	1 030	110	115	119
24 Friedrichshagen	14 844	956	922	1 111	1 037	96	116	108
25 Neukölln	(4) 275 604	957	932	1 004	1 023	97	105	107
26 Spandau	95 474	990	971	1 043	1 068	98	105	108
27 Zehlendorf	20 557	938	973	1 104	1 144	104	118	122
Reg.-Bez. Potsdam								
1 Bernau	9 204	869	996	1 047	1 085	115	120	125
2 Brandenburg a. H.	52 972	865	914	990	1 050	106	114	121
3 Eberswalde	26 786	908	927	1 028	1 015	102	113	112
4 Freienwalde a. O.	8 323	903	918	978	1 024	102	108	113
5 Jüterbog	7 891	843	887	958	980	105	114	116
6 *Lehnin	2 396	922	996	985	1 095	108	107	119
7 Luckenwalde	22 742	844	987	977	989	117	116	117
8 Nauen	8 734	981	1 019	1 029	1 073	104	105	109
9 Neuruppin	17 215	860	855	907	964	99	105	112
10 *Nowawes	25 582	801	946	1 009	1 010	118	126	126
11 Oranienburg	12 777	941	989	976	1 002	105	104	106
12 Perleberg	9 551	839	889	915	970	106	109	116
13 Potsdam	58 397	979	1 048	1 026	1 081	107	105	110
14 Prenzlau	19 650	787	854	923	921	109	117	117
15 Rathenow	24 885	896	928	959	1 004	104	107	112
16 Wittenberge	24 257	875	928	978	968	106	112	111
Reg.-Bez. Frankfurt								
1 Arnswalde	9 799	806	919	946	970	114	117	120
2 Cottbus	48 046	839	881	957	1 026	105	114	122
3 Cüstrin	18 522	984	1 008	1 019	1 065	102	104	108
4 Finsterwalde	12 754	1008	1 037	1 106	1 160	103	110	115
5 Forst (Lausitz)	32 216	908	910	993	1 129	100	109	124
6 Frankfurt a. O.	65 055	874	898	997	991	103	114	113
7 Fürstenberg a. O.	6 319	856	928	896	976	108	105	114
8 Fürstenwalde a. Sp.	21 522	843	888	928	992	105	110	118
9 Guben	37 987	934	842	997	1 003	90	107	107
10 Landsberg a. W.	39 752	842	914	957	962	109	114	114
11 Senftenberg	(5) 13 346	1011	1 031	1 093	1 067	102	108	106
12 Sommerfeld	10 700	886	995	991	1 008	112	112	114
13 Sorau (Nied.-Laus.)	15 651	798	965	1 015	1 051	121	127	132
14 Spremberg	10 563	968	949	1 030	1 028	98	106	106
Reg.-Bez. Stettin								
1 Altdamm	8 390	898	886	936	962	99	104	107
2 Anklam	14 355	829	859	974	958	104	117	116
3 Demmin	12 001	969	917	947	979	95	98	101
4 Gollnow	10 155	971	813	870	896	103	110	113
5 Pasewalk	11 041	960	906	964	977	94	100	102
6 Stargard i. Pom.	28 629	903	955	1 002	1 007	106	111	112
7 Stettin	232 726	986	947	1 044	1 040	96	106	105
8 Swinemünde	15 587	834	959	1 010	1 015	115	121	122
Reg.-Bez. Köslin								
1 Belgard	10 406	832	978	1 045	1 061	118	126	128
2 Bublitz	5 112	874	983	969	981	112	111	112
3 Kolberg	29 021	1046	1 013	1 085	1 100	97	104	105
4 Köslin	27 005	916	1 036	958	986	113	105	108
5 Lauenburg i. Pom.	14 777	840	897	964	1 051	107	115	125
6 Neustettin	13 264	877	958	984	1 024	109	112	117
7 Schlawe	7 063	877	858	977	1 007	98	111	115
8 Stolp i. Pom.	37 603	963	1 054	1 034	1 047	109	107	109
Reg.-Bez. Stralsund								
1 Barth	6 898	783	856	907	913	109	116	117
2 Greifswald	34 374	933	862	978	1 004	92	105	108
3 Stralsund	36 396	815	886	917	941	109	113	115
Verw.-Bez. Westpreußen-Posen								
1 Deutsch-Krone	8 191	800	938	948	1 042	117	119	130
2 Fraustadt	7 297	815	904	1 013	1 047	111	124	128
3 Meseritz	6 334	878	868	922	915	99	105	104
4 Schneidemühl	32 569	843	989	965	1 001	117	114	119

[1]) ab 1. 5. 21 mit Friedrichsfelde. — [2]) ab 1. 4. 21 mit Friedenau. — [3]) ab 1. 7. 21 mit Lankwitz und Lichterfelde. — [4]) ab 1. 4. 21 mit Britz. — [5]) nach dem Gebietsumfang vom 1. Juli 1920.

Figure IA6: Wealth distribution of clients

This figure shows the wealth distribution of clients in January 1920 and the wealth distribution of individuals subject to wealth tax in Germany in December 1913. Only individuals who had net wealth of more than 10,000 *Mark* had to pay the wealth tax in 1913. For individuals subject to the wealth tax, financial wealth accounted for 57.8% of net wealth. We use this figure to estimate clients' net wealth from the portfolio market values in January 1920. We deflate the estimated net wealth of clients in January 1920 using the national inflation rate to obtain an estimate for the net wealth of clients in December 1913.

Figure IA7: Unemployment

This figure shows the monthly number of applicants per 100 open positions between January 1920 and December 1924.

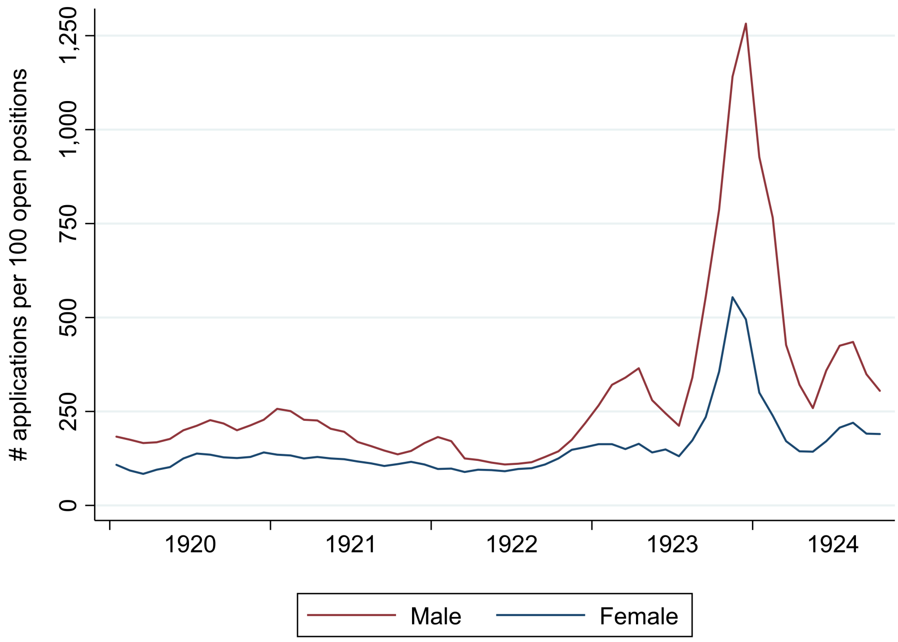
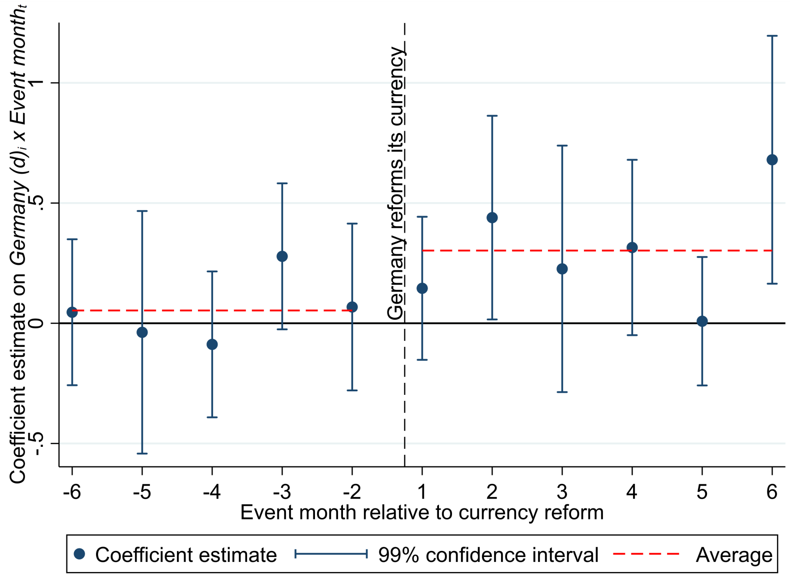


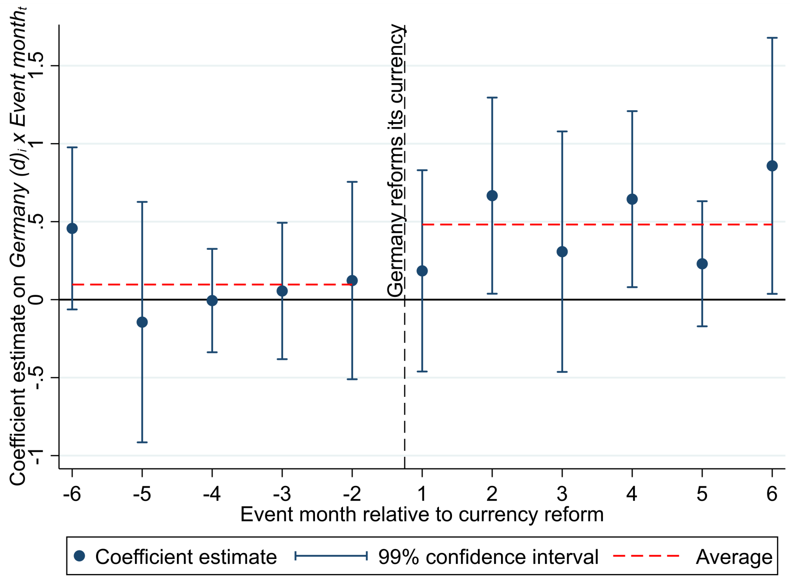
Figure IA8: Local inflation and stock trades around the currency reform

This figure shows coefficient estimates from regressing the monthly buy-sell imbalance for stocks on a dummy variable that equals one for clients who live in Germany, dummy variables that equal one for different event months, and interaction terms between the dummy variable that equals one for clients who live in Germany and the dummy variables that equal one for different event months. In Panel A, we estimate the regression without client fixed effects. In Panel B, we estimate the regression with client fixed effects. We focus on the time period starting six months prior to the currency reform and ending six months after the currency reform. The omitted month is September 1923 (event month –1). The sample includes all clients who live in Germany and all clients who live in neighboring countries. Appendix A in the main paper provides detailed descriptions of all variables used throughout the study. Standard errors are double-clustered at the client and month level. The figures show point estimates together with 99% confidence intervals.

Panel A: Without client fixed effects



Panel B: With client fixed effects



Internet Appendix B: Discussion of Table IA1

In Table IA1, we analyze whether the results from our baseline regression in Column 2 of Table 3 in the main paper are robust to using different transformations of the local inflation measure and different measures for clients' stock trading activities. We first employ different inflation measures as explanatory variables to address the potential concern that our results are an artifact of the inverse hyperbolic sine transformation. In Column 1, we therefore use monthly raw local inflation and winsorize it at the 1% level and the 99% level to account for potential outliers. In Column 2, we use the natural logarithm of monthly local inflation and set observations with negative inflation to zero to retain the same sample. In Column 3, we use inflation deciles formed on a monthly basis, as used in Figure 1 in the main paper. Across all these inflation measures, we document a significantly negative relation between local inflation and buy-sell imbalances for stock trades, suggesting that the inverse hyperbolic sine transformation of local inflation is not driving our results.

We also change the dependent variable and use alternative measures of clients' investment behavior in stocks to assure that our findings are not driven by the choice of the buy-sell imbalance measure. When computing our baseline measure of stock buy-sell imbalances, we follow the existing literature and only consider months in which clients trade (e.g., Barber and Odean, 2008; Barber et al., 2019). In Column 4 of Table IA1, we additionally include months in which clients do not trade by setting the buy-sell imbalance for these months to zero. In Column 5, we compute buy-sell imbalances based on the face value of stock trades rather than the number of stock trades. More specifically, the buy-sell imbalance measure is defined as the difference between the face value of stocks bought and the face value of stocks sold divided by the sum of the face value of stocks bought and stocks sold. In Column 6, instead of using buy-sell imbalance measures, we use the natural logarithm of the face value of client's stock holdings as dependent variable. Across all specifications, we find a negative and statistically significant association between monthly local inflation and the different dependent variables, suggesting that our results are also robust to alternative measures of investment behavior.

References

Barber, B.M., S. Lin, and T. Odean, 2019, Mediating investor attention, Working Paper, University of California, Davis.

Barber, B.M., and T. Odean, 2008, All that glitters: The effect of attention and news on the buying behavior of individual and institutional investors, *Review of Financial Studies* 21, 785-818.