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The Long Shadow of War Finance: Historical Bond Exposure and Contemporary Inflation Beliefs in Austria

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Abstract

This master's thesis investigates whether historical exposure to World War I war bonds and the related economic trauma of hyperinflation have persistent effects on inflation belief formation in Austria. By linking historical district-level bond subscription data to contemporary survey data, it examines whether regional differences in war bond exposure are associated with contemporary inflation beliefs and the accuracy of inflation expectations relative to realized inflation. Contrary to the assumptions in the literature on inflation memory, higher historical bond exposure is associated with lower inflation expectations and perceptions, as well as higher accuracy in inflation expectations. The findings suggest that historical economic trauma may foster more restrained and better-calibrated expectations rather than generally heightened inflation fears.

Zusammenfassung

Diese Masterarbeit untersucht, ob die historische Beteiligung an Kriegsanleihen während des Ersten Weltkriegs und das damit verbundene wirtschaftliche Trauma der Hyperinflation anhaltende Auswirkungen auf die Bildung von Inflationserwartungen und -wahrnehmungen in Österreich haben. Durch die Verknüpfung historischer Daten zu Kriegsanleihenzeichnungen auf Bezirksebene mit aktuellen Umfragedaten wird geprüft, ob regionale Unterschiede in der Beteiligung an Kriegsanleihen mit heutigen Inflationswahrnehmungen und -erwartungen sowie mit der Genauigkeit dieser zusammenhängen. Entgegen Annahmen aus der Literatur zum Thema Inflationsgedächtnis ist eine höhere historische Anleihenzeichnung mit niedrigeren Inflationserwartungen und -wahrnehmungen sowie einer höheren Genauigkeit der Inflationserwartungen verbunden. Die Ergebnisse legen nahe, dass historische wirtschaftliche Traumata eher zu zurückhaltenderen und besser kalibrierten Erwartungen führen als zu allgemein erhöhten Inflationsängsten.

Transparency Statement

In the process of writing this master's thesis, I made use of artificial intelligence (AI) tools in the following ways:

- To support the identification of relevant literature, I used NotebookLM and ChatGPT to to help narrow the scope of potentially relevant sources. This enabled more focused research on the most relevant works for this thesis.
- To support programming in R, I used ChatGPT to assist with coding-related issues. This was used exclusively to improve coding efficiency and to facilitate the implementation of econometric methods that I independently specified.
- During the writing process, I used ChatGPT selectively to refine the phrasing of passages, and Grammarly for final corrections in grammar and spelling. All substantive content, arguments, and interpretations were developed independently.

No AI tools were used beyond the purposes described above.

I hereby affirm that this thesis is my own work and has been prepared in accordance with the University of Vienna's standards for good academic practice.

Clara Rosanna Höfling

Vienna, 21st April 2026

Contents

1. Introduction

During the First World War, the government of Austria-Hungary mobilized private savings on an unprecedented scale by issuing bonds to finance the costly war effort. The war introduced a new dimension of industrialized warfare that required substantial investments in armaments by the belligerent parties. Moreover, the empire's government underestimated the duration of the conflicts and was thus faced with unexpectedly high and prolonged costs. The war bonds were issued in eight series and were widely and intensively promoted among private households and public and private institutions. This led to a large share of the Austro-Hungarian population investing in war bonds from 1915 to 1918. However, the empire was defeated, and with its collapse in 1918, the war bonds completely lost their value, so that bondholders were never repaid. The new Republic of Austria faced substantial fiscal distress, and in the subsequent years, Austrians experienced one of the most severe hyperinflation periods of the twentieth century. For many households, the loss of their financial savings to war bonds, combined with extreme price instability, constituted a profound economic shock. This episode represents a critical moment in Austrian economic history and raises the question of whether such large-scale financial trauma has left lasting traces in the formation of inflation beliefs until today.

Research in economics and related disciplines shows that past experiences of inflation can shape current perceptions and expectations of inflation, as well as economic behavior - sometimes across generations. This mechanism is, among others, well-described by Nagel and Malmendier (2011) and is known as inflation experience or inflation memory. Typically, experience with inflation or other economic shocks is associated with higher inflation expectations, greater sensitivity to inflation shocks, or more risk-averse savings decisions. On a larger scale, regional variation in exposure to past economic crises, such as war-bond losses, as well as differences in past investment behavior across regions, may lead to differences in present inflation beliefs. Such patterns were inter alia described in studies for Germany (Haffert, Redeker & Rommel, 2021), Austria (Camous & Garcia Soto, 2025), and the United States (Brunet, Hilt & Jaremski, 2025). Understanding the mechanisms that drive variation in economic attitudes and behaviors could also inform more nuanced economic and monetary policy and related communication.

The long-term effects of inflation memory at the collective level have been more well-studied for the United States and Germany, whereas the Austrian case remains comparatively underexplored. This is despite the relevance of the case, which is given by its severe economic trauma in the early 1920s and the widespread loss of war bond investments. Much of the existing research on this period of Austrian economic history remains historical in nature, lacking a quantitative analysis and link to current socio-economic

patterns. Furthermore, previous research has addressed the history of war bonds and the consequences of hyperinflation individually, but rarely in relation to each other. In particular, it remains unclear whether regional differences in war bond exposure and consequent losses during hyperinflation continue to shape inflation beliefs.

This thesis addresses this gap by linking historical district-level data on war bonds to contemporary micro-level survey data on inflation perceptions and expectations in Austria. Two research questions guide the analysis: first, To what extent is the regional exposure to war bond subscriptions during World War I associated with contemporary differences in inflation beliefs in Austria?; and second, How does such exposure affect the accuracy of inflation expectations relative to realized inflation?. In line with the literature, higher historical bond exposure is initially expected to be associated with increased inflation perception and expectations.

The empirical strategy relies on variation across districts in war bond subscriptions. Due to constraints in coverage and consistency in the historical dataset, subscriptions to war bond IV serve as a proxy for war bond exposure, normalized to per capita values. These historical differences are matched to contemporary survey responses on inflation perception and inflation expectation. The contemporary dataset covers the years 2022 to 2024, a period characterized by renewed inflationary pressures following the COVID-19 pandemic and the Russian invasion of Ukraine. This setting provides relevant context for testing long-term inflation memory in Austria during a new inflationary episode. By linking historical war-bond data to contemporary survey evidence, this thesis contributes to the literature with a first systematic analysis of long-term inflation memory in Austria, including an examination of the role of war bonds. The findings of this study hint towards a correlation that is contrary to previous literature on this topic. Austrian regions that were historically more exposed to war bonds during World War I are associated with lower contemporary inflation perceptions and inflation expectations, with consistent results across all survey years. Compared with the average, individuals in historically more exposed regions make more accurate inflation predictions.

The remainder of this thesis is structured as follows. Chapter 2 reviews the literature on inflation memory and situates the analysis within the existing research. In Chapter 3, the historical background of the topic is provided, focusing on war bond subscriptions and the subsequent hyperinflation episode. Chapter 4 describes the historical and contemporary data sources and outlines the matching procedure used to construct the final dataset. A descriptive analysis of it is conducted in Chapter 5. Chapter 6 introduces the econometric framework used to address the research questions. The empirical results thereof are presented in Chapter 7 and discussed in Chapter 8. Chapter 9 outlines the limitations of the analysis and suggests avenues for future research, before concluding the thesis in Chapter 10.

2. Inflation Memory

In the literature on behavioral economics and political economy, it is well-established that economic experiences can have persistent effects on beliefs, preferences, and behavior. Early empirical and theoretical work on experience effects emerged in the context of financial markets, where Nagel and Malmendier (2011) formalize experience effects in a model incorporating individuals' past asset returns to explain heterogeneity in financial risk taking. The authors document that individuals who have lived through periods of low stock market performance are later more financially risk-averse, less likely to participate in financial markets, and allocate a smaller share of wealth to stocks for decades thereafter. On this basis, the authors find that an entire cohort can become systematically more risk-averse due to collective exposure to economic downturn, as shown for "Depression Babies". Extending this logic to inflation, Malmendier and Nagel (2016) show that lifetime inflation experiences influence individuals' inflation expectations, while personally experienced events matter more than historical records outside individuals' own lifetime. Subsequent studies show that the effects of inflation experience influence housing and mortgage decisions, allocations in financial portfolios, and correlate with overestimation of future inflation (Botsch & Malmendier, 2023; Malmendier & Steiny, 2017). Also, professional economists are not immune to such effects, as Malmendier, Nagel and Yan (2021) show that central bankers' personal inflation memory influences their policymaking.

Robust evidence also exists for systematic heterogeneity in inflation beliefs across demographic groups. Malmendier and Nagel (2016) show that younger individuals are more responsive to inflation shocks in their inflation beliefs. The same applies to women, who are not only more reactive, but also have higher inflation perceptions and expectations on average (Corduas, 2022; D'Acunto, Ospina, Malmendier & Weber, 2021; Jonung, 1981). These gender differences are rooted in traditional gender roles, as women are typically more often exposed to grocery prices (D'Acunto, Malmendier & Weber, 2021). Consistent with this interpretation,D'Acunto, Malmendier and Weber (2021) show that the gender gap in inflation expectations diminishes in households that share grocery shopping more evenly.

Beyond individual experiences, the related literature identifies mechanisms of intergenerational transmission. Bisin and Verdier (2001) provide a theoretical framework for the intergenerational transmission of preferences, while Farvaque and Mihailov (2009) suggest that inflation aversion can persist across generations with an overlapping generations model. Farvaque and Mihailov (2009) argue that older generations are more inflation-averse and provide empirical evidence that demographic dynamics shape inflation aversion at the societal level. The collective memory of historical shocks can also be reactivated

during present economic crisis and thereby shape political and economic behavior (Fouka & Voth, 2023). In political science and related interdisciplinary fields, the effects of historical events on current attitudes and behaviors are more extensively explored. Lindgren and Oskarsson (2023) find intergenerational persistence in political activity and Nunn and Wantchekon (2011) provide evidence for effects on trust through cultural transmission, with long-term economic and political consequences. This embedding of preferences and attitudes in culture was described by Hayo (1998) with regard to inflation aversion. He points out Germany, where the collective experience of hyperinflation fostered a "stability culture" in the long run.

The case of Germany is of interest for this research, as it shares a similar experience of war bonds and hyperinflation with Austria. Germany is frequently referred to as a prime example of collective inflation memory, although studies revealed that individuals' recall of historical inflation episodes is often inaccurate (Haffert et al., 2021). In German regions that were more exposed to hyperinflation, individuals today still report higher inflation expectations and greater sensitivity to inflation (Braggion, von Meyerinck, Schaub & Weber, 2024). The inflation memory is transmitted through within-family channels or narratives, reinforced by local media coverage and political speeches (Braggion et al., 2024). The study most closely related to this thesis was conducted by Camous and Garcia Soto (2025), who analyze the effects of regional variation in historical hyperinflation-exposure on contemporary inflation expectations in Austria. They find that regions historically strongly exposed to inflation show stronger responsiveness to current inflation shocks and identify transmission channels through local media.

The long-term consequences of war bond campaigns have received considerably less attention, particularly in Europe. Existing evidence, primarily from the United States, shows that war bond campaigns increased total household savings with lasting effects (Brunet, Hilt & Jaremski, 2024), and increases individuals' likelihood to invest in the stock market and retirement funds decades later (Brunet et al., 2025). The effects are confined to generations that directly experienced the bond campaigns - no significant transmission to younger generations is observed (Brunet et al., 2025). Furthermore, these studies are conducted in a context in which war bond investments turned out to be profitable, unlike the Austrian case. In the United States, war bond campaigns have also been found to affect political outcomes, such as inequality (Zielinski, 2018), and voting outcomes (Brunet, Hilt & Jaremski, 2023).

Despite the close historical link between war bond losses and hyperinflation in Austria, no study has systematically examined whether regional variation in war bond exposure is associated with contemporary inflation beliefs yet. Overall, the existing research focuses on inflation experience alone or treats war bond finance and hyperinflation as separate historical phenomena. By directly linking district-level war bond subscriptions to present-day inflation perceptions and expectations, this thesis combines these strands of literature and provides the first quantitative assessment of whether war bond exposure

affects long-run inflation memory and contemporary inflation beliefs in Austria.

3. Historical Context

To examine the long-term effects of war bond exposure, it is essential to situate the analysis within its historical context. This chapter outlines Austria-Hungary's economic position during World War I and the role of war bonds as a central instrument of war financing. It describes the structure of the eight bond issues, the extensive promotion, and the broad participation across society, which together provide the foundation for widespread financial exposure. It then summarizes the post-war period, including the collapse of the empire, the loss of bond value, the hyperinflation episode, and the eventual stabilization. The historical overview thereby establishes the context in which the historical economic trauma is rooted, enabling investigation of potential lasting effects.

3.1. Austria-Hungary and the Financing of World War I

Austria-Hungary constituted a major Central European power in the late 19th and early 20th century and was administratively divided into the Cisleithania (Austrian half) and Transleithania (Hungarian half). The outbreak of the First World War in 1914 ended fifty years of relative peace in Europe and introduced new dimensions of industrialized warfare and war finance: industrial capacity and financial power became decisive, battles more material-intensive, and large-scale fiscal mobilization reshaped the relation between state, economy, and society (Perz, 1989; Winkelbauer, 2004). The conflict was anticipated as the first "total war" that would be decided by the bankruptcy of states, rather than by heroic battles (Winkelbauer, 2004, p. 372).

Like other European powers, Austria-Hungary had expanded its armament expenditures before 1914 in an escalating arms race. Nonetheless, the empire's limited industrial base and resources left its armed forces comparatively under-equipped (Winkelbauer, 2004). Unlike Britain, France, or Russia, which had prepared more systematically financially, Austria-Hungary entered the conflict with strained fiscal finances and little experience in large-scale war finance (Kirchmair, 2019; Perz, 1989). As a result, it faced the dual challenge of sustaining a prolonged material-intensive war while financing the rapidly escalating military expenditure.

Central bank credit and domestic war bonds became the principal sources to finance the war. In August 1914, the obligation of the Austro-Hungarian Bank to convert banknotes into gold was suspended, effectively ending the gold standard and laying the foundation for extensive inflationary deficit financing (Perz, 1989; Winkelbauer, 2004). War bonds

were issued separately in the Austrian and Hungarian parts of the empire and became a central vehicle for mobilizing private savings. Between 1914 and 1918, eight Austrian war bonds were issued, and by 1918, the central bank's claims against the state amounted to roughly 35 billion Crowns (Winkelbauer, 2004).

3.2. The Eight War Bond Issues

The first war bond, issued in November 1914, was considered a major success, raising approximately 2.2 billion Crowns (Heller, 1915–1918). Bond II, issued in May 1915, reached 2.68 billion Crowns and thereby surpassed the first in nominal, but not inflation-corrected terms (Perz, 1989). Early issues were largely subscribed to by wealthy classes, who had the necessary capital, a strong interest in the empire's survival, and limited alternative investment opportunities during wartime (Moll, 1988). War bond III, issued in October 1915, marked a shift toward broader participation through smaller denominations and raised 4.2 billion Crowns - the only issue that exceeded the first in inflation-adjusted terms (Perz, 1989). From bond IV onward, authorities introduced long-term bonds with a maturity of 40 years, alongside short-term treasury bills, to spread the maturities after the war. The interest rate for both types was identical (Perz, 1989). For bond IV, subscriptions amounted to 4.52 billion crowns, of which roughly 2.15 billion were subscribed in seven-year treasury bonds, while forty-year bonds took up the remainder (Perz, 1989). Because the minimum denomination of treasury bonds was 1,000 crowns, long-term bonds were likely predominantly held by smaller investors (Perz, 1989). Bond V, issued in November 1916, raised 4.46 billion crowns, partly offset by a campaign to convert short-term bond holdings into long-term bonds (Perz, 1989). The subsequent bonds (VI to VIII) yielded significantly lower returns due to war weariness among the population, financial exhaustion, inflation, and growing doubts about the government's ability to service its debt (Perz, 1989). Despite high nominal results, inflation-adjusted values fell well below the early issues.

By the end of the war in 1918, the collapse of the empire triggered a flight from war bonds, accompanied by widespread Lombard borrowing against bonds from the central bank, which further accelerated inflation (Perz, 1989). With the defeat, the war bonds became virtually worthless. Large parts of the Austrian population were confronted with the realization that their savings, which they had believed to be secure, had vanished (Winkelbauer, 2004). By the end of the war, prices had risen to roughly sixteen times their pre-war level (Winkelbauer, 2004). In the end, the direct costs of the war are estimated at 81 to 90 billion crowns, with indirect losses far exceeding them (Kirchmair, 2019).

3.3. Distribution and Social Reach of War Bonds

To mobilize the required vast financial resources, the imperial authorities employed a comprehensive propaganda campaign to promote war bond subscriptions among households and institutions. Newspapers, billboards, and other media framed subscriptions as patriotic duties and a safe, profitable investment that would contribute to a quick, favorable war-ending (Winkelbauer, 2004). The propaganda was systematically planned and targeted at audience groups. It included diverse ways of addressing them: poems, stories, and calculations conveyed the message, and public subscription lists exerted strong social pressure (Moll, 1988; Perz, 1989; Winkelbauer, 2004). An exemplary poem published to promote war bond subscriptions is provided in the Appendix to illustrate the tone and narrative of propaganda publications.

Local networks of respected and influential individuals were recruited to persuade subscribers in a personal way, institutions like perishes, schools, and cooperatives were explicitly urged to subscribe, and when missing "target subscription quotas", sometimes invited to interrogations (Moll, 1988). Soldiers received home leave to promote war bonds in their communities (Perz, 1989). State and banks encouraged borrowing to finance subscription- collateral for such loans included future receivables, or next season's harvests (Perz, 1989). Such measures further facilitated monetary expansion and inflation. As Perz (1989, p. 7) notes, this policy aimed to create a society of indebted citizens that mirrored the state's own financial situation. The loss in value of war bonds eventually affected large shares of households across all socioeconomic groups, as well as companies and other private and public institutions. Private finances were just as disrupted as the empire's fiscal household by the end of the war.

3.4. Post-War Collapse and Hyperinflation

Following the defeat and dissolution of the empire in 1918, the Republic of Austria was established. The new state faced severe economic and fiscal disruption and never repaid the outstanding bonds. With that, the total losses of bondholders were definitive. The nation's loss of much of the pre-war territory, population, industry, and trade networks substantially weakened its economic base (Sargent, 1982). At the same time, outstanding reparations payments, food relief programs, and unemployment support to address acute societal issues created increased fiscal pressure (Sargent, 1982). In the absence of sufficient tax revenues, the government relied heavily on monetary expansion until 1922 (Sargent, 1982). This policy contributed to accelerating inflation, which culminated in the severe hyperinflation between 1921 and 1922.

In 1922, Austria implemented a comprehensive stabilization program endorsed by the League of Nations, marking the turning point in the economic crisis (Sargent, 1982). The program provided a substantial international loan, combined with strict monetary and

fiscal discipline, and the creation of an independent central bank (Sargent, 1982). It ultimately introduced the Schilling and restored convertibility to gold, anchoring Austria to the interwar gold exchange-standard (Sargent, 1982). Within approximately two years, the Austrian government succeeded in restoring a fiscal balance and laying the foundations for sustained monetary stability (Sargent, 1982).

This period, nevertheless, disrupted household savings, intergenerational transfers, and eroded trust in financial institutions, with war bonds arguably intensifying both financial losses and mistrust. The following analysis examines whether this experience continues to be reflected in regional inflation beliefs in Austria more than a century later.

4. Data

The empirical analysis combines historical district-level data on war bond subscriptions with contemporary micro-level survey data on inflation beliefs. The core objective is to construct a regional measure of historical war bond exposure and link it to present-day individuals, using a consistent geographic identifier. This section describes the data sources and the procedure used to merge historical and contemporary information.

4.1. Historical War Bond Data

Historical war bond subscription data is obtained from the five-volume documentation of war bonds written by Heller (1915–1918) under the title "Unsere Kriegsanleihen – Monumente des Patriotismus". Embedded in a propagandistic explanation of the war bond issues, Heller provides extensive numerical documentation of the distribution and economic characteristics of the eight war bonds.

A systematic assessment of data availability revealed that only war bond IV provides sufficiently detailed and regionally consistent district-level documentation to allow a reliable quantitative analysis. Other bond issues were excluded due to incomplete or uneven regional coverage. War bond IV represents an issue that still had remarkable success compared to the subsequent war bonds V-VIII in real terms, while involving high participation of smaller investors. Thus, it provides a limited yet suitable proxy for regional war bond exposure. The extracted dataset consists of total subscription volumes aggregated at the level of historical districts.

Based on the historical data on war bond IV by Heller, figure 4.1 visualizes the spatial distribution of subscriptions across the area of present-day Austria. The map reports the sums of subscriptions per historical district expressed in Crowns. The gray areas indicate the regions for which no suitable historical data are available.

The total volumes reported by Heller range from 137,800 Crowns in Saalfelden am Steinernen Meer (in the province of Salzburg) at the lower end to 245,195,325 Crowns in the city of Graz at the upper end. Other districts with particularly high total subscriptions include the cities of Vienna, Salzburg, Linz, and Klagenfurt, which are apparent as darker spots on the map. In general, Figure 4.1 reveals substantial variation in war bond subscriptions across Austrian districts, which is suitable for the regression analysis.

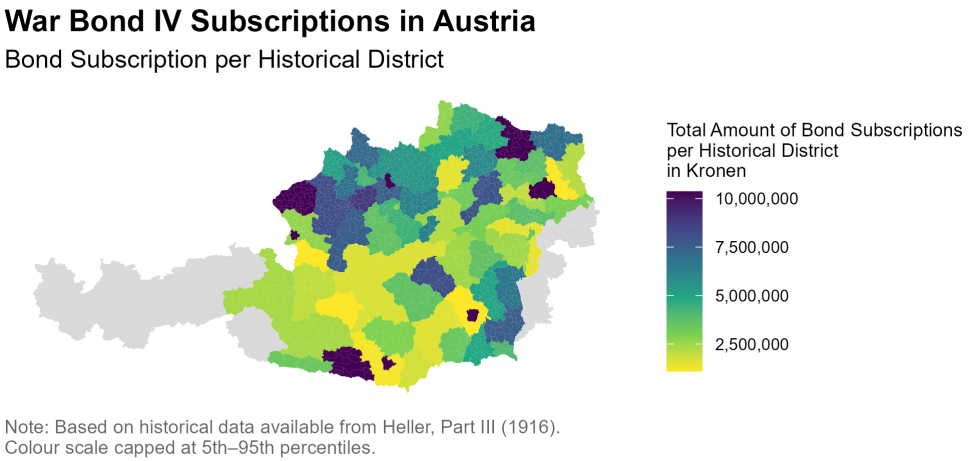

Figure 4.1.: War bond IV subscriptions of historical districts

4.2. Historical Population Data

To obtain a regionally comparable measure of exposure, subscription volumes were normalized by district population. Population figures are drawn from the 1910 census of the Austro-Hungarian Monarchy (K.k. Statistische Zentralkommission, 1912), the last comprehensive census before the war. Population figures were reported for each historical district, which directly correspond to those in Heller's documentation. Using population records from 1910 as the denominator introduces some measurement error, as wartime mobilization, displacement, and other factors likely altered district populations until 1916, when bond IV was issued. Nevertheless, this approach provides the closest available proxy to the true district-level population in 1916. War bond IV subscriptions per capita are constructed as:

$$\text{Bond Exposure}_j = \frac{\text{Total Subscriptions}_j}{\text{Population}_{j,1910}} \tag{4.1}$$

where j denotes the historical district.

Figure 4.2 visualizes the bond IV subscription data, combined with the historical population data from 1910. Total subscriptions per historical district are normalized to the per capita values and reported in Crowns. In comparison to figure 4.1, the extremes of the distribution become less pronounced as more districts move into intermediate categories. In particular, Vienna no longer stands out as a high-subscription area, as its large population offsets the high aggregate subscription volume. In contrast, most

districts that already appeared as high-subscribing in absolute terms remain in the upper range when measured per capita.

At the same time, several districts that were not prominent in the map of absolute amounts emerge more prominently in the per-capita representation. These cases indicate pockets of strong local participation that are obscured when only total volumes are considered. The per-capita map provides a more nuanced picture of regional exposure to war bond IV and corresponds to the measure of historical war bond exposure that is used in the econometric analysis.

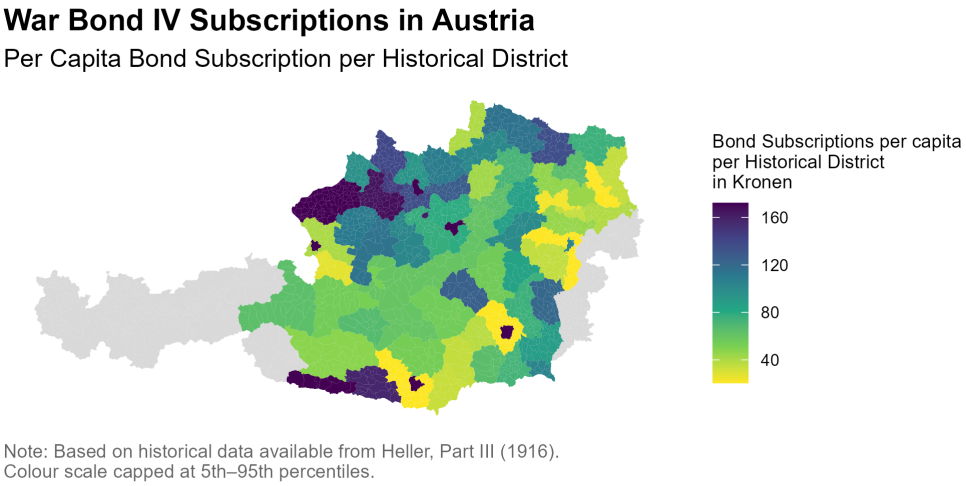

Figure 4.2.: War bond IV subscriptions per capita

4.3. Contemporary Survey Data

Contemporary data on inflation beliefs are drawn from the Consumer Confidence Barometer that Ipsos Austria conducts on a monthly basis on behalf of the European Commission. The survey includes measures of perceived change in prices over the past twelve months and expected change in prices over the next twelve months, both reported in percentage. These two measures represent the central measures for this thesis's analysis of inflation perception and inflation expectation. In addition, the survey captures several demographic and socio-economic variables and geographic location reported in Local Administrative Unit - Code (LAU).

The survey covers the period May 2020 to October 2024. However, precise geographical identifiers are available only from 2022 onward. Thus, spatial matching with historical data is only possible from this point on and restricts the analytical sample to the years 2022-2024.

Figure 4.3 maps the contemporary survey data on inflation perception in Austria for each LAU for the period 2022-2024. It depicts the weighted average perceived price change over the past 12 months in percent. Regions shaded in gray indicate LAUs for which no survey observations for inflation perception are available. The map shows that data on inflation perception are available at the LAU level across all federal states, yet a notable number of municipalities remain uncovered by the dataset. Although there is strong variation, no regional pattern is recognizable in this visualization. This suggests that there is no localized clustering by region of high or low inflation perceptions.

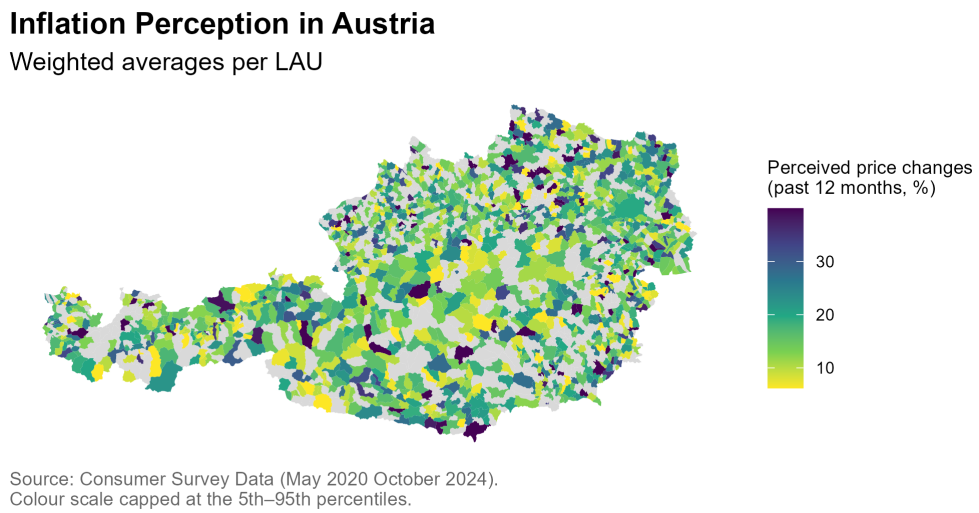

Figure 4.3.: Inflation perception in Austria

Figure 4.4 depicts the weighted average inflation expectation in Austria for the same period. Based on the survey data, the expected price changes over the next 12 months are reported as percentages for each LAU. Similar to figure 4.3, this map reveals substantial variance in expected inflation but does not depict a distinct spatial pattern- inflation expectations appear to be distributed rather randomly across Austrian districts.

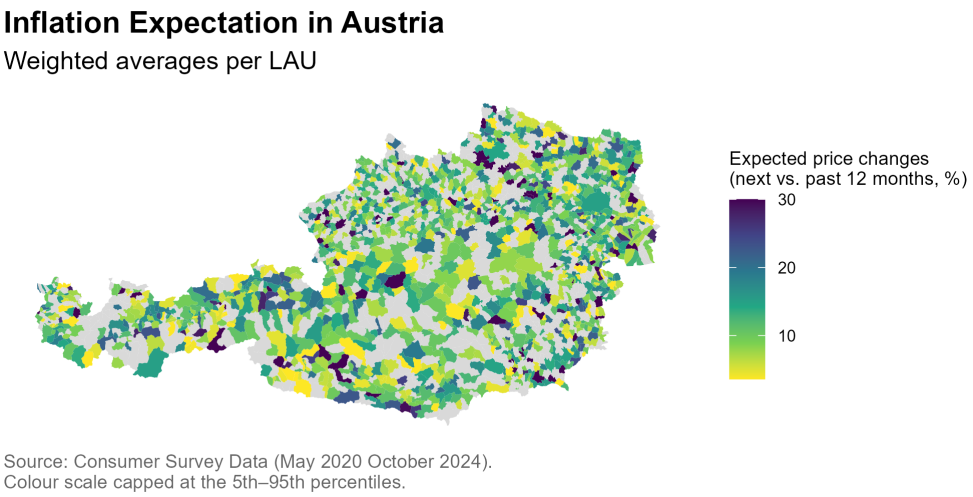

Figure 4.4.: Inflation expectation in Austria

4.4. Contemporary Inflation Data

To account for the macroeconomic environment of survey respondents, the analysis incorporates monthly inflation statistics. Inflation is measured using the Harmonized Index of Consumer Prices (HICP) at a monthly frequency, retrieved from the Eurostat database (eurostat, 2026). Inflation rates are matched to survey responses by interview month and enter the regressions as a control.

4.5. Matching Historical and Contemporary Data

The central step in the empirical strategy is linking historical district-level war bond exposure to contemporary survey respondents. The consumer survey documents respondents' place of residence using Local Administrative Units (LAU), which roughly correspond to municipalities in Austria and provide a stable geographic identifier.

Historical bond data is reported for districts of Cisleithania, which do not correspond one-to-one to present administrative units. To bridge this gap, a crosswalk between historical districts and modern LAU codes was constructed. For each historical district, all current municipalities that historically belonged to that district were identified and assigned. As a primary source for this mapping, the Eurostat database on LAU codes was used (eurostat, 2025). Only unambiguous matches were retained; uncertain cases were excluded. The historical data includes territories outside present-day Austria, which were also excluded from the analysis. Moreover, no sufficiently detailed data was available for

Tyrol, Vorarlberg, or Burgenland, the latter historically belonging to the Hungarian part of the empire. The final matched sample, therefore, covers districts located in present-day Lower Austria, Vienna, Upper Austria, Carinthia, Salzburg, and Styria. In total, 1,548 LAU codes are assigned to 83 historical districts. The full crosswalk linking historical districts to contemporary LAU regions comprises more than 2,000 observations and is therefore not reported in its entirety. Further details on the construction of the crosswalk and an excerpt are provided in the Appendix.

Each survey respondent from the contemporary dataset is matched to a historical district using the LAU code and assigned to the corresponding war bond IV subscriptions per capita value. Monthly national inflation is merged by interview month. The resulting analytical dataset combines individual-level information on inflation perceptions and expectations, socio-demographic controls, a district-level measure of historical war bond exposure, and current macroeconomic conditions.

5. Descriptive Analysis

Table 5.1.: Descriptive statistics

Variable	N	Mean	Min	Max	SD	Var
Inflation expectation	24254	11.77	0	100	13.59	184.70
Inflation perception	26791	15.05	0	99.99	15.72	247.22
Monthly inflation	30000	5.16	0.60	11.60	3.34	11.14
Expectation gap	24254	6.43	-11.6	99.40	13.49	181.94
Age (years)	30000	50.30	16	99	17.68	312.43
Gender (female)	30000	0.510	0	1	0.500	0.250
Years of education	30000	11.80	9	17	2.72	7.39
Household size	23262	1.93	1	5	1.08	1.17
Full employment	29522	0.40	0	1	0.49	0.24
Household income	23071	3345.41	750	8000	1636.40	2.68e6
Town size	30000	555626	1000	2000000	807700	6.52e11
Bonds per capita	16368	236.99	10.42	1883	468.35	2.19e5

Table 5.1 shows the summary statistics of the final combined dataset that is used for analysis, covering 30,000 observations in total, of which 16,368 could be assigned to historical bond data. The statistics for inflation beliefs reveal substantial heterogeneity: expected inflation ranges from 0 to 100 percent, with an average of 11.77% and a high standard deviation of 13.59. Perceived inflation ranges similarly, with stronger heterogeneity (SD = 15.72) and a mean of 15.05%. Both averages exceed the highest observed monthly inflation, peaking at 11.06% in October 2022 and January 2023. The average inflation rate over the observed period was 5.16%. Inflation is thus overestimated in both backward- and forward-looking measures. This is reflected in the mean inflation expectation gap of 6.43 percentage points.

Demographically, the sample is predominantly middle-aged (mean = 50 years, SD = 17 years) and comprises approximately equal shares of men and women (51 percent women). On average, individuals have 11.8 years of education, roughly corresponding to the level of the Austrian Matura. The average household consists of roughly 2 people, and 40% of the sample are fully employed. Household income and town size show meaningful heterogeneity.

Historical bond exposure also varies considerably across districts. Bonds per capita

have a mean of 237 Crowns and a wide range (10 to 1,883), indicating substantial cross-regional differences that provide identifying variation for the empirical analysis.

Table 5.2 reports the pairwise correlations between the main variables. Historical bond exposure is weakly negatively correlated with both inflation expectations and perceptions, providing preliminary descriptive evidence consistent with the regression results. Inflation expectations and perceptions are strongly positively correlated, indicating that both measures capture closely related components of inflation beliefs. Their correlation with actual inflation is positive but relatively small, suggesting only partial adjustment to realized inflation. Age and gender exhibit moderate correlations with inflation beliefs. For gender, the direction of the correlation is consistent with the results of the regression analysis. However, age exhibits negative correlations with inflation expectations and inflation perceptions, whereas the regression analysis yields positive relationships after including additional controls. This sign reversal reflects the distinction between conditional and unconditional correlation and underscores the importance of including additional individual-level controls. A complete correlation matrix of all variables included in the regression analysis is provided in the Appendix.

Table 5.2.: Correlation matrix

	Bonds pc	Infl. exp.	Infl. perc.	Inflation	Age	Gender
Bonds pc	1	-0.050	-0.029	-0.005	0.041	-0.006
Infl. exp.	-0.050	1	0.730	0.082	-0.161	0.110
Infl. perc.	-0.029	0.730	1	0.057	-0.149	0.120
Inflation	-0.005	0.082	0.057	1	0.003	0.004
Age	0.041	-0.161	-0.149	0.003	1	-0.166
Gender	-0.006	0.110	0.120	0.004	-0.166	1

Figure 5.1 plots the weighted averages of inflation expectation, inflation perception, and national inflation over the full sample period and visualizes respondents' systematic overestimation of inflation. Both inflation belief measures broadly track inflation's upward and downward movements and some inflationary shocks, but consistently exceed inflation throughout the period. The overprediction is already present at the beginning of the period. As inflation rises in 2021, inflation beliefs remain roughly stable until the beginning of 2022, when all three measures rise sharply. However, when actual inflation decreases during 2023, inflation perception and inflation expectation decrease at a lower rate. Especially as inflation perception rises, exceeding 20 percent, and decreases more slowly than inflation expectations. This suggests that respondents have already become more optimistic about inflation, i.e., begin to anticipate lower future inflation, while perceived current inflation remains persistently high. This systematic overestimation motivates using the inflation expectation gap as an outcome variable.

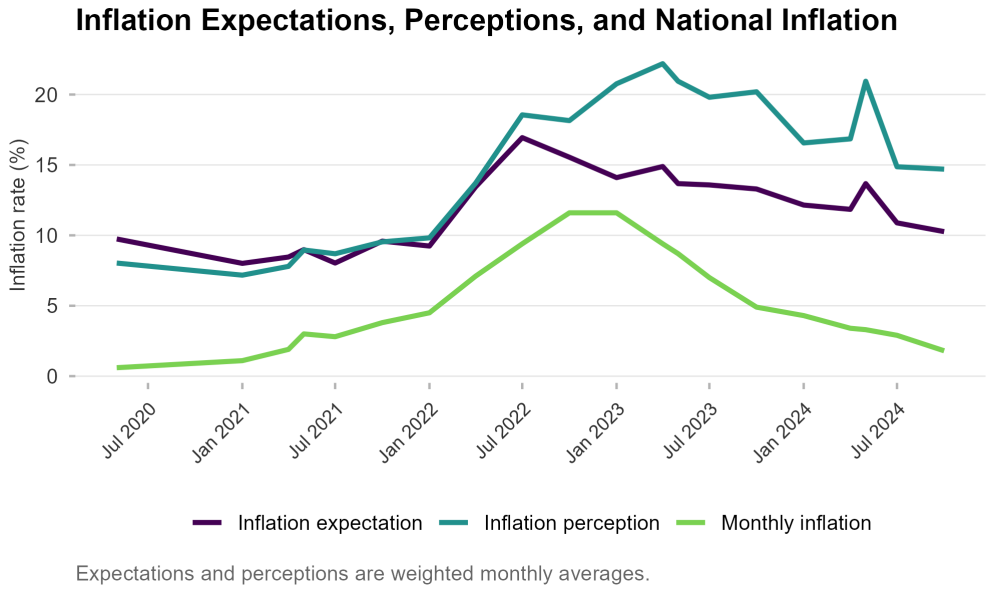

Figure 5.1.: Inflation and inflation beliefs over time

Figure 5.2 depicts the data of the final dataset, which combines the historical war bond IV data with contemporary survey data. It displays war bond subscriptions per capita for those historical districts for which contemporary survey observations are available. Thereby, it visualizes all LAUs that enter the regression analysis. The color coding reflects the level of war bond IV subscriptions per capita across these districts in crowns, while the gray areas represent regions that do not enter the regression. The resulting spatial coverage is relatively uniform across regions where historical data is available, and the map confirms that the analytical sample exhibits significant variation in historical war bond exposure.

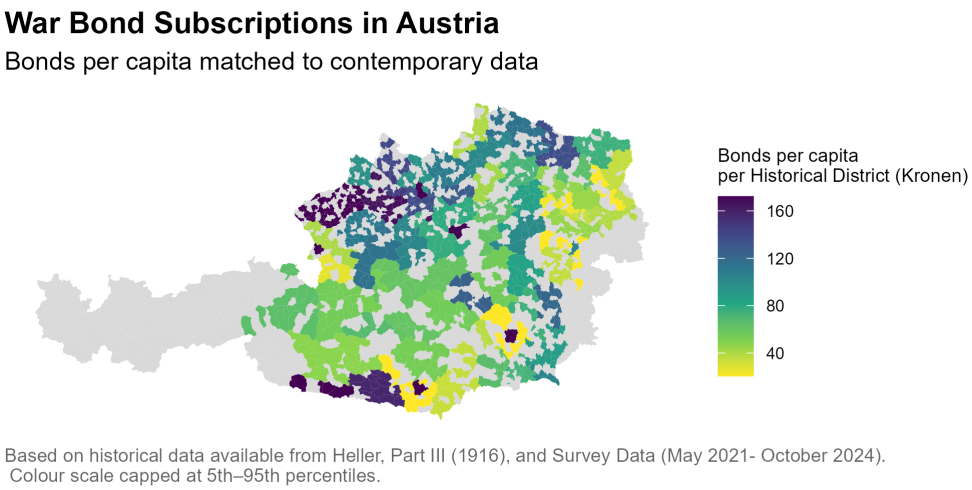

Figure 5.2.: War bond IV subscriptions matched to contemporary data

6. Methodology

This section outlines the empirical strategy used to assess whether historical exposure to war bonds is associated with persistent differences in contemporary inflation beliefs. First, a baseline model relates regional war bond exposure to individual inflation perceptions and expectations. Second, an alternative specification examines whether historical war bond exposure systematically affects the accuracy of inflation expectations relative to inflation.

6.1. Baseline Specification

The baseline empirical model is given by:

$$\log(1 + Y_{ijt}) = \alpha + \beta \log(B_j) + \gamma \pi_t + \delta X'_{ijt} + \varepsilon_{ijt} \tag{6.1}$$

Where the dependent variable Y_{ijt} denotes either perceived inflation or expected inflation of individual i, residing in historical district j, and observed in period t (from May 2020 to October 2024). A log transformation of the form $\log(1 + Y_{ijt})$ is applied to the dependent variable to approximate the standard logarithm of observations and allow for survey responses reporting zero, which accounts for 17 observations for inflation perception and 39 observations for inflation expectations.

The key explanatory variable B_j measures bond exposure in historical district j. π_t denotes the national monthly inflation rate in period t. The vector X_{ijt} contains individual-level socio-economic controls, including gender, age, age squared, a dummy for full-time employment, years of education, household size, household net income, and town size. ε_{ijt} represents the error term.

Standard errors are clustered at the historical district level to account for within-district correlation in unobserved determinants of inflation beliefs. The coefficient β captures the elasticity of the dependent variable with respect to historical war bond exposure. A positive estimate ($\beta > 0$) thus indicates that individuals residing in historically more exposed districts would, on average, perceive or expect higher inflation than individuals in historically less exposed districts. Conversely, ($\beta < 0$) would indicate a negative correlation.

The coefficient γ on contemporaneous inflation π_t captures the average response of individual inflation beliefs to the current inflation environment. Overall, model 1 tests

for persistent regional differences in inflation perceptions and expectations that can be traced to variation in historical war bond exposure. To examine potential changes over time, the baseline regressions are also estimated separately for the years 2022, 2023, and 2024, for both measures of inflation beliefs.

6.2. Forecast-Error Specification

As an extension of the baseline model, an alternative specification is employed to examine whether historical war bond exposure affects the accuracy of inflation expectations. For this purpose, the dependent variable is defined as the inflation expectation gap:

$$\text{Inflation Expectation Gap}_{ijt} = E_{ijt} - \pi_t \tag{6.2}$$

Where E_{it} denotes individual i's inflation expectation in month t, and π_t the realized national inflation rate in month t. Since inflation is measured over the past twelve months and expectations refer to the upcoming twelve months, this measure captures the deviation of expectations from the current inflation environment.

The empirical model is given by:

$$\text{Inflation Expectation Gap}_{ijt} = \alpha + \beta \log(B_j) + \gamma \pi_t + \delta X'_{ijt} + \varepsilon_{ijt} \tag{6.3}$$

In this specification, the dependent variable is the inflation expectation gap of individual i in district j and month t. Like in the baseline model, B_j measures bond exposure in district j, X_{ijt} is a vector of individual-level controls, and standard errors are clustered at the historical district level.

The coefficient β captures whether historical war bond exposure is associated with systematic deviations of expectations from realized inflation (inflation expectation gap), and in which direction. For the interpretation of β, it is important to note that respondents in the sample generally overpredict inflation, with an average inflation expectation gap of more than 6 percentage points. Thus, $\beta > 0$ would indicate that individuals in historically more exposed districts exhibit larger forecast errors and overpredict inflation to a greater extent. Conversely, $\beta < 0$ would imply that individuals in historically more exposed districts have smaller forecast errors - either overpredicting inflation to a smaller degree (i.e., forming more accurate expectations) or, depending on the magnitude, underpredicting inflation.

Whereas the baseline model focuses on the level effect of war bond exposure on inflation beliefs, the forecast-error specification evaluates expectations relative to actual inflation. It thus adds a distinction between differences in average inflation beliefs and differences in expectation accuracy to the analysis, providing a more comprehensive picture of how historical war bond exposure is related to contemporary inflation expectations.

7. Results

Table 7.1 reports the results of the baseline regression model for inflation expectation and inflation perception. The coefficient on log(bonds per capita) is negative and statistically significant at the 1% level for inflation expectation, indicating a robust negative correlation. Thus, individuals in districts with higher bond exposure tend to expect lower inflation today, which is contrary to the hypothesis that collective memory of inflationary episodes increases inflation expectations. For inflation perception, the corresponding coefficient is statistically insignificant. The coefficient on monthly inflation is positive and significant at the 1% level for both measures, confirming that individuals positively adjust their inflation beliefs in response to current inflation.

Age has a positive, statistically significant effect on both dependent variables, whereas the negative, statistically significant effect of age squared indicates that the effect of age decreases with higher ages. This indicates that individuals who have lived through periods closer to the war bond and hyperinflation period report elevated inflation beliefs. Women systematically expect and perceive higher inflation than men, with the coefficient indicating a statistically significant and economically meaningful difference.

Full employment has a small negative and only marginally significant effect on inflation expectations and no significant effect on inflation perception. More educated individuals report lower inflation expectations and inflation perceptions, while individuals in larger households tend to report somewhat higher inflation beliefs. Household income has a significant negative coefficient, but the magnitude is economically relatively negligible. The same holds for town size, where the coefficients on both inflation expectations and perceptions are effectively zero.

Overall, the models exhibit moderate explanatory power, with R^2 values of 0.089 for inflation expectation and 0.074 for inflation perception, indicating that a modest share of the total variation in inflation beliefs can be explained by the included variables, leaving room for unobserved heterogeneity.

Table 7.2 presents the results of the baseline regression for inflation expectations estimated separately for the years 2022, 2023, and 2024. The coefficient on log(bonds per capita) is negative in all three years and thus consistently rejects the hypothesis, although its magnitude and statistical significance decline over time. The positive coefficients on inflation are positive in 2022 and more so in 2024. In 2022 and early 2023, actual inflation was high and strongly increasing before declining in the second half of 2023 and 2024. The insignificance of the monthly inflation coefficient in 2023 suggests a temporary

Table 7.1.: Baseline model regression results

	Dependent variable:	
	Inflation expectation (log(1+y))	Inflation perception (log(1+y))
	(1)	(2)
Log(Bonds per capita)	-0.031^{***}	-0.006
	(0.011)	(0.007)
Monthly inflation	0.030^{***}	0.028^{***}
	(0.003)	(0.002)
Age (years)	0.015^{**}	0.022^{***}
	(0.007)	(0.005)
Age^2	-0.0002^{***}	-0.0003^{***}
	(0.0001)	(0.00004)
Gender (female)	0.093^{***}	0.090^{***}
	(0.019)	(0.018)
Full employment	-0.043^{*}	-0.010
	(0.024)	(0.024)
Years of education	-0.033^{***}	-0.036^{***}
	(0.004)	(0.004)
Household size	0.026^{**}	0.017^{*}
	(0.012)	(0.009)
Household income	-0.0001^{***}	-0.00005^{***}
	(0.00001)	(0.00001)
Town size	0.00000^{**}	0.000
	(0.000)	(0.000)
Constant	2.666^{***}	2.701^{***}
	(0.176)	(0.127)
District clustered SEs	Yes	Yes
Period	2022-2024	2022-2024
Observations	7,823	8,803
R^2	0.089	0.074

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered at the historical district level.

Table 7.2.: Baseline model for inflation expectation per year

	Dependent variable:		
	Inflation expectation (log(1+y))		
	2022	2023	2024
	(1)	(2)	(3)
Log(Bonds per capita)	−0.040***	−0.031***	−0.024*
	(0.014)	(0.012)	(0.012)
Monthly inflation	0.031***	0.007	0.084***
	(0.010)	(0.006)	(0.019)
Age (years)	0.016**	0.011**	0.019***
	(0.006)	(0.005)	(0.006)
Age^2	−0.0002***	−0.0002***	−0.0003***
	(0.0001)	(0.0001)	(0.0001)
Gender (female)	0.057	0.120***	0.093***
	(0.039)	(0.031)	(0.033)
Full employment	0.066	−0.061*	−0.100***
	(0.045)	(0.036)	(0.038)
Years of education	−0.032***	−0.034***	−0.031***
	(0.007)	(0.006)	(0.006)
Household size	−0.006	0.043***	0.027
	(0.020)	(0.016)	(0.017)
Household income	−0.0001***	−0.0001***	−0.0001***
	(0.00001)	(0.00001)	(0.00001)
Town size	−0.000	0.00000**	0.00000*
	(0.00000)	(0.00000)	(0.00000)
Constant	2.690***	2.893***	2.401***
	(0.197)	(0.141)	(0.159)
District clustered SEs	Yes	Yes	Yes
Period	2022	2023	2024
Observations	1,967	3,155	2,701
R^2	0.053	0.091	0.096

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered at the historical district level.

decoupling between inflation expectations and inflation during a period of exceptionally high and volatile inflation. The expectations were corrected upwards in 2024, even though actual inflation fell again.

The effect of age remains positive and broadly stable over the sample period, whereas the gender effect is significant only in 2023 and 2024, with the estimate declining somewhat in 2024. This is consistent with the literature indicating that women are more sensitive to inflation-related price shocks, which were present in this period. The negative effect of full employment increases in magnitude and significance from 2023 to 2024. An explanation may be that fully employed individuals are less sensitive to the inflation shock, which is stronger than the general upward adjustments after 2023. The negative effect of education is consistent across all three years. Household size has a positive and significant effect only in 2023, when inflation was at its peak, suggesting that larger households adjust their inflation expectations more strongly during periods of high inflation, as they are more exposed. The negative effect of household income is moderate, but stable across the years.

Overall, the model fit improves in 2023 and 2024 compared to 2022, with higher R^2 values indicating that the specification explains a larger share of the variation in inflation expectations during the peak inflation and the subsequent year.

Table 7.3 reports the regression results for inflation perception from the baseline model for the years 2022, 2023, and 2024. The effects of bond exposure are not as evident as for inflation expectations. Only in 2022 is the negative correlation significant. Still, the effect also counters the hypothesis. The constant positive coefficients on inflation confirm that perceived inflation is strongly correlated with price changes. The effect is strongest in 2024 and weakest in 2023, aligning with the pattern observed in inflation expectations and may be driven by the same decoupling-and-upward-adjustment mechanism.

The individual-level control variables largely mirror the patterns observed in the inflation expectation regressions, with the individual controls exhibiting similar signs and magnitudes. This confirms that inflation perception and inflation expectation are closely related. The model fit, as reflected in the R^2 values, remains fairly stable across the three years.

Table 7.4 reports the regression results for the inflation expectation gap, reflecting the accuracy of inflation forecasts. On average, the inflation expectation gap is 6.43 percentage points, indicating that, on average, individuals overestimate inflation. All regression coefficients in this specification should therefore be interpreted relative to this baseline level of overprediction.

The coefficient on the correlation of bond exposure is negative and statistically significant, implying that expectations of individuals in regions historically more exposed to war bonds are, on average, less overpredicting and more accurate than those of individuals

Table 7.3.: Baseline model for inflation perception per year

	Dependent variable:		
	Inflation Perception (log(1+y))		
	2022	2023	2024
	(1)	(2)	(3)
Log(Bonds per capita)	−0.025**	−0.003	0.008
	(0.012)	(0.010)	(0.011)
Monthly inflation	0.070***	0.016***	0.109***
	(0.008)	(0.005)	(0.017)
Age (years)	0.017***	0.023***	0.025***
	(0.006)	(0.004)	(0.005)
Age^2	−0.0002***	−0.0003***	−0.0003***
	(0.0001)	(0.00004)	(0.0001)
Gender (female)	0.021	0.116***	0.095***
	(0.034)	(0.026)	(0.031)
Full employment	0.043	−0.039	−0.014
	(0.040)	(0.030)	(0.035)
Years of education	−0.032***	−0.035***	−0.036***
	(0.006)	(0.004)	(0.005)
Household size	0.0002	0.024*	0.017
	(0.017)	(0.013)	(0.015)
Household income	−0.0001***	−0.00004***	−0.0001***
	(0.00001)	(0.00001)	(0.00001)
Town size	−0.00000**	0.00000	0.00000
	(0.00000)	(0.000)	(0.00000)
Constant	2.438***	2.812***	2.345***
	(0.172)	(0.123)	(0.144)
District clustered SEs	Yes	Yes	Yes
Period	2022	2023	2024
Observations	2,096	3,564	3,143
R^2	0.088	0.075	0.079

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered at the historical district level.

Table 7.4.: Forecast error specification

	Dependent variable:
	Forecast error (Expectation - Inflation)
Log(Bonds per capita)	-0.473^{**}
	(0.187)
Monthly Inflation	-0.675^{***}
	(0.045)
Age (years)	0.209
	(0.149)
Age^2	-0.003^{**}
	(0.001)
Gender (female)	1.773^{***}
	(0.369)
Full employment	-0.917^{**}
	(0.425)
Years of education	-0.405^{***}
	(0.082)
Household size	0.743^{***}
	(0.217)
Household income	-0.001^{***}
	(0.0001)
Town size	0.00000^{**}
	(0.00000)
Constant	20.377^{***}
	(3.329)
District clustered SEs	Yes
Monthly inflation included	Yes
Period	2022-2024
Observations	7,823
R^2	0.092

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered at the historical district level.

in less exposed regions. The negative coefficient on monthly inflation yields that the inflation expectation gap decreases with increasing inflation, which is at hand considering the systematic overestimation.

The regression results confirm that women systematically overpredict inflation more than men, which is consistent with the literature. On the other hand, fully employed individuals overpredict inflation less and thus exhibit somewhat more accurate expectations. The same applies to more educated individuals. The effects of household size underscore the previous results, as the overprediction is substantially stronger among larger households.

Table 7.5 reports the results for the inflation expectation gap estimated separately by year. The coefficient on historical bond exposure remains negative throughout the period, with the largest magnitude in 2022. It remains statistically significant in 2023 but loses significance in 2024, suggesting that it is strongest during the peak inflation phase and weakens as inflation declines.

The effect of systemic overprediction by older generations is confirmed only for 2022 and 2024, whereas the significant positive effect of being female is most pronounced in the peak-inflation year 2023. This suggests that the gender gap in forecast error increases with high inflation. Employment's negative correlation with the inflation expectation gap is confirmed only in 2024, whereas the negative effect of years of education on the inflation expectation gap remains robust across all three years. The positive correlation between household size is most pronounced in 2023, when larger households were particularly sensitive to spikes in grocery and consumption prices. Income effects remain stable across the period.

Table 7.5.: Forecast error specification per year

	Dependent variable:		
	Forecast error (Expectation - Inflation)		
	2022	2023	2024
	(1)	(2)	(3)
Log(Bonds per capita)	−0.691***	−0.457**	−0.316
	(0.251)	(0.226)	(0.196)
Monthly inflation	−0.656***	−0.921***	−0.180
	(0.160)	(0.118)	(0.315)
Age (years)	0.282**	0.149	0.235**
	(0.111)	(0.096)	(0.094)
Age^2	−0.004***	−0.003***	−0.004***
	(0.001)	(0.001)	(0.001)
Gender (female)	0.828	2.647***	1.554***
	(0.711)	(0.595)	(0.571)
Full employment	0.785	−1.150	−1.857***
	(0.840)	(0.707)	(0.662)
Years of education	−0.483***	−0.425***	−0.301***
	(0.111)	(0.100)	(0.099)
Household size	0.129	1.107***	0.749**
	(0.368)	(0.329)	(0.303)
Household income	−0.002***	−0.001***	−0.001***
	(0.0003)	(0.0002)	(0.0002)
Town size	0.00000	0.00000	0.00000
	(0.00000)	(0.00000)	(0.00000)
Constant	21.516***	23.023***	16.723***
	(3.513)	(2.712)	(2.595)
District clustered SEs	Yes	Yes	Yes
Monthly inflation included	Yes	Yes	Yes
Period	2022	2023	2024
Observations	1,967	3,155	2,701
R^2	0.066	0.100	0.085

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered at the historical district level.

8. Discussion

The empirical results shed light on the two research questions that form the basis of this paper. First, To what extent is the regional exposure to war bond subscriptions during World War I associated with contemporary differences in inflation beliefs in Austria?; and second, How does such exposure affect the accuracy of inflation expectations relative to realized inflation?. Regarding the first research question, the analysis indeed provides evidence of a statistically significant relationship in Austria. However, the observed correlation is negative for all regressions and thus explicitly contradicts the hypothesis. The results of the baseline regression show that, in regions with higher historical war bond subscriptions per capita, individuals today report lower inflation expectation on average and thereby make more accurate predictions. The effect is even strongest in peak-inflation years, which makes a further opposition to previous literature that indicates increased sensitivity in inflation expectations in response to inflation shocks (Camous Garcia-Soto, 2025).

This thesis stands in contrast to previous literature, which consistently provides evidence for positive correlations between inflation experience and inflation expectation (Nagel and Malmendier, 2016; Botsch and Malmendier, 2020; Malmendier and Steiny, 2017; Farvaque and Mihailov, 2009). The deviation is especially striking when compared to the closest related studies on hyperinflation memory in Germany (Braggion et al., 2024) and Austria (Camous and Garcia Soto, 2025).

By contrast, historical war bond exposure does not exhibit a robust impact on perceived current inflation, as only one coefficient reaches moderate statistical significance. This suggests that an inflation memory effect related to war bond exposure primarily affects forward-looking beliefs, rather than the assessment of current inflation environment. A hypothesis to explain this pattern is that individuals in these regions may pay closer attention to inflationary developments and macroeconomic conditions, stay better informed, and thereby forming expectations that react to shocks, without overshooting as strongly as the average.

The specification in model two, verifies that war bond exposure is correlated with more accurate, though still upward-biased, expectations and thereby answers the second research question. If memories of financial losses from the war bond investments have indeed been transmitted across generations, they appear to be associated with more realistic predictions in a high-inflation environment, rather than with heightened fear of inflation.

The role of contemporaneous inflation is in line with literature, as monthly inflation

increases individuals' inflation perception and expectation. These findings confirm that individuals anchor their inflation beliefs in the observed inflation environment. The positive effect of age on inflation beliefs is noteworthy and can be interpreted from different angles. Older individuals, whose lifetimes are closer to the period of war bond losses and hyperinflation, persistently report higher perceived and expected inflation. However, this correlation disproves the hypothesis that inflation memory in more exposed regions leads to more accurate expectations. In that line of reasoning, older individuals would also pay better attention to inflationary developments and have more accurate inflation expectations. The diminishing marginal effect implied by the age-squared term mitigates but does not overturn this conclusion. Moreover, the effect of age is not aligned with the findings of Malmendier and Nagel (2016), who report that older generations tend to expect lower inflation than younger ones during high-inflation periods.

On the other hand, the results for gender closely match with existing evidence (Corduas, 2022; D'Acunto, Malmendier Weber, 2021a; Jonung, 2019). Coefficient for the female dummy are positive, statistically significant, and economically relevant in almost all specifications. The effect becomes particularly pronounced in the peak-inflation year 2023, consistent with the claim that women, as primary grocery shoppers in many households, are more exposed to price increases (D'Acunto et al., 2021a; D'Acunto et al., 2021b). In the forecast-error model, this translates into a larger inflation expectation gap for women, i.e. a stronger inflation-overpredict inflation than men.

Employment, education, and household income show negative effects on inflation beliefs in some regressions and correlate to a smaller overestimation of inflation. These findings imply that individuals who are less vulnerable to price increases due to better job and financial situations, or higher academic qualifications, perceive inflation as less severe and similarly are less anxious about future price developments. Household size works in the opposite direction: larger households tend to report higher perceived and expected inflation and show larger forecast errors, particularly in 2023. This likely reflects stronger exposure and vulnerability to grocery and consumption expenses.

From a policy perspective, the findings suggest that historical economic experiences can shape expectation formation in subtle but lasting ways. Understanding heterogeneous belief formation and regional variation in inflation beliefs could support targeted communication strategies and contribute to more effective expectation management, most relevant in times of elevated inflation.

9. Limitations and Further Research

Several limitations of this study should be acknowledged. First, the analysis focuses on a relatively narrow segment of the war bond period, relying on documentation from a single historical source and on a single war bond out of eight. The historical data provide only partial, uneven coverage, which limits the reliability of the analysis's results. More extensive archival work, covering all war bonds and additional sources, would enable a more precise reconstruction of subscription patterns and allow for more accurate analysis of long-run effects. Such data could also support research on broader political and economic consequences of war bonds, complementing existing studies (Brunet et al., 2023; Brunet et al., 2025; Zielinski, 2018).

Second, the contemporary survey data covers a period characterized by unusually high macroeconomic volatility, overlapping crises, and elevated inflation. Inflation beliefs formed in this environment may not be fully representative of beliefs in more "normal" times, as a wide range of crisis-specific factors likely influenced inflation beliefs. This limits the ability to generalize from the findings to long-run, steady-state effects of inflation memory.

Further insights into the effects of historical war bond exposure could be attained by investigating whether the effects of inflation beliefs also translate to systemically different economic behavior. This could be achieved by linking war bond subscription patterns to observable economic behaviors, such as portfolio composition, homeownership, or choices between fixed-rate and adjustable-rate mortgages. Also, including information on family migration histories would allow for comparisons between descendants of long-term residents and individuals who moved into historically exposed districts at a later stage. Thereby, insights into the vertical (intra-family) versus horizontal transmission through local collective reinforcement of inflation memory could be gained.

Finally, the channels of collective memory transmission remain only indirectly addressed. Future research could combine regional data on inflation beliefs with analysis of local media and political speech, following the approach of Camous and Garcia Soto (2025), to assess how narratives about war bonds and hyperinflation are maintained or reinforced.

10. Conclusion

This thesis examined whether regional exposure to war bond IV during World War I has left a persistent imprint on contemporary inflation beliefs in Austria. By combining detailed historical district-level data on war bond subscriptions with modern micro-level survey data on inflation perceptions and expectations, the analysis provides new evidence on the long-run consequences of the financial shocks in the early 20th century. It contributes to the literature on inflation memory by shifting the focus from historical inflation exposure alone to the financial losses associated with war bond devaluation paired with the subsequent hyperinflation.

Contrary to the initial hypothesis and the research consensus, higher historical war bond exposure is not associated with elevated contemporary inflation expectations in this analysis. Instead, the results consistently show a negative relationship between war bond exposure and expected inflation. Individuals residing in historically more exposed districts report lower inflation expectations and, furthermore, exhibit smaller inflation expectation gaps. Given that respondents in the sample systematically overestimate inflation on average, this implies that individuals in more exposed regions form relatively more accurate expectations. The effect is particularly pronounced during the peak inflation years of 2022 and 2023, suggesting that historical exposure is most relevant in periods of heightened macroeconomic uncertainty.

These findings stand in contrast to much of the existing inflation-memory literature, suggesting that the Austrian war bond case differs in a notable way. Rather than generating persistent inflation anxiety, historical war bond exposure appears to be associated with more restrained or better-calibrated expectations. One possible interpretation is that the collective experience of financial loss may have generated greater attentiveness to macroeconomic developments or to more cautious belief formation.

At the same time, the analysis confirms well-established patterns in the formation of inflation beliefs regarding current inflation, demographic effects, and other individual-level indicators. These results align closely with the broader literature. While the results do not support a narrative of persistent inflation fear stemming from hyperinflation experiences, they do suggest that historical financial experiences continue to correlate with regional differences in expectation formation more than a century later.

From a macroeconomic policy perspective, understanding how this heterogeneity in regional historical experiences shapes households' inflation beliefs can be relevant for communication strategies, particularly during high-inflation periods. Overall, the thesis

highlights that collective financial shocks can leave measurable traces in contemporary economic beliefs more than a century later. Future research may further explore the transmission channels underlying these patterns and assess whether similar mechanisms operate in other historical and institutional contexts.

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A. Appendix

Example of war bond advertisement - poem

Österreichs Kriegsanleihe- Zeichnung.

Klein-Hannchen strickt an einem Strumpf
Für unsere wackeren Krieger,
Für ihren Vater sind sie längst
Schon heldenhafte Sieger.
Und er erzählt: „Der Kaiser rief
Uns alle zu den Waffen,
Er will, daß wir nun auch das Gold
Für diesen Krieg beschaffen.
Ein treues Volk hört diesen Ruf,
Und gibt mit vollen Händen,
Denn dieses Riesenstreiten muß
Mit unserm Siege enden.
Ein Lump, wer nicht zum Schwerte greift
Und gibt, was sonst sein Eigen,
Wir wollen, was wir wirklich sind,
Jetzt stolz den Feinden zeigen!“
Klein-Hannchens Augen blitzen hell,
Sie geht zu ihrem Schreine,
Vor einem Bankenschalter steht
Gar bald darauf die Kleine.
Sie spricht: „Hier hast du all mein Gut,
Ich hab’ es gern gegeben,
Und wenn es etwas nützen könnt’,
Gäb’ ich auch noch mein Leben.“
„Für eine Krone, liebes Kind,
Und für dein junges Leben,
Kann ich beim besten Willen auch
Dir keine Renten geben.“
„Das habe ich auch nicht verlangt,
Du sollst nebst diesen Ringen
Dem Kaiser mit der Krone nur

Mein Armband überbringen.
Das ist mein liebes Taufgeschenk,
Ich werd's, sobald wir siegen,
Von ihm am ersten Jubeltag
Ganz sicher wieder kriegen!“

A.H. Kling- Vienna, 18th of November 1918

Source: Reproduced from Heller (1915–1918, p. 70), Vol. 1.

Austria's War Bond Subscription - English translation

Little Hannchen knits a stocking
For our brave warriors,
To her father, they have long been
Heroic victors.
And he tells her: “The Emperor called
Us all to arms,
He wants us now to raise the gold
For this war.
A loyal people hears this call,
And gives with generous hands,
For this great battle must
End in our victory.
A scoundrel is he who does not take up the sword
And give what is otherwise his own,
We want to show what we really are,
Now proudly to the enemies!”
Little Hannchen's eyes sparkle brightly,
She goes to her shrine,
And stands before a bank counter
Soon after, the little girl.
She says: “Here are all my possessions,
I have given them gladly,
And if it might be of any use,
I would even give my life.”
“For a crown, dear child,
And for your young life,
I cannot, with all good will,
Give you any annuity.”
“I didn't ask for that either,
Along with these rings,
You should simply deliver

My bracelet to the Emperor with the crown.
That is my dear christening gift,
I will surely get it back
From him on the first day of celebration
Once we have won!"

A.H. Kling- Vienna, 18th of November 1918

Source: Reproduced from Heller (1915–1918, p. 70), Vol. 1.

Crosswalk LAU - Historical District

This section provides additional detail on the procedure used to match contemporary LAU codes with the historical districts used in the historical data sources. Table A.1 presents an excerpt of the constructed crosswalk, which comprises 2,094 LAU codes in total. Historical states and districts are derived from the historical sources, while the complete list of Austrian LAU codes is obtained from the Eurostat database on correspondence tables (`https://ec.europa.eu/eurostat/web/nuts/local-administrative-units`). This dataset includes LAU names, LAU codes, and NUTS-3 codes, the latter representing an administrative level below the federal states.

In the matching procedure, all LAU codes corresponding to a given historical district were assigned accordingly. Most often, the NUTS-3 classification aligns with historical district boundaries, as illustrated in the excerpt. Historical districts representing cities are explicitly labeled as such and can be directly matched to the corresponding contemporary LAU code, as exemplified by "Stadt Klagenfurt" in Table A.1.

In a very limited number of cases, these direct matching procedures were not sufficient, requiring additional investigation into historical changes in administrative boundaries or district names. Only unambiguous matches were retained in the final crosswalk. The complete crosswalk table is handed in as an attachment.

Table A.1.: Excerpt of crosswalk between historical districts and LAU regions

Historical state	Historical district	NUTS-3	LAU code	LAU name
Kärnten	Stadt Klagenfurt	AT211	20101	Klagenfurt am Wörthersee
Kärnten	Villach	AT211	20201	Villach
Kärnten	Hermagor	AT212	20302	Dellach
Kärnten	Hermagor	AT212	20305	Hermagor-Pressegger See
Kärnten	Hermagor	AT212	20306	Kirchbach
Kärnten	Hermagor	AT212	20307	Kötschach-Mauthen
Kärnten	Hermagor	AT212	20316	St. Stefan im Gailtal
Kärnten	Hermagor	AT212	20320	Gitschtal
Kärnten	Hermagor	AT212	20321	Lesachtal
Kärnten	Klagenfurt - Land	AT211	20402	Ebenthal in Kärnten
Kärnten	Klagenfurt - Land	AT211	20403	Feistritz im Rosental
Kärnten	Klagenfurt - Land	AT211	20405	Ferlach
Kärnten	Klagenfurt - Land	AT211	20409	Grafenstein
Kärnten	Klagenfurt - Land	AT211	20412	Keutschach am See
Kärnten	Klagenfurt - Land	AT211	20414	Köttmannsdorf
Kärnten	Klagenfurt - Land	AT211	20415	Krumpendorf am Wörthersee
Kärnten	Klagenfurt - Land	AT211	20416	Ludmannsdorf
Kärnten	Klagenfurt - Land	AT211	20417	Maria Rain
Kärnten	Klagenfurt - Land	AT211	20418	Maria Saal
Kärnten	Klagenfurt - Land	AT211	20419	Maria Wörth
Kärnten	Klagenfurt - Land	AT211	20421	Moosburg
Kärnten	Klagenfurt - Land	AT211	20424	Pörtschach am Wörther See
Kärnten	Klagenfurt - Land	AT211	20425	Poggersdorf
Kärnten	Klagenfurt - Land	AT211	20428	St. Margareten im Rosental
Kärnten	Klagenfurt - Land	AT211	20432	Schiefling am Wörthersee
Kärnten	Klagenfurt - Land	AT211	20435	Techelsberg am Wörther See
Kärnten	Klagenfurt - Land	AT211	20441	Zell
Kärnten	Klagenfurt - Land	AT211	20442	Magdalensberg
Kärnten	Sankt Veit	AT213	20501	Althofen
Kärnten	Sankt Veit	AT213	20502	Brückl
Kärnten	Sankt Veit	AT213	20503	Deutsch-Griffen
Kärnten	Sankt Veit	AT213	20504	Eberstein

Table A.2.: Full correlation matrix

	Bonds pc	Infl. exp.	Infl. perc.	Inflation	Age	Gender	Employment	Education	Income	Town size
Bonds pc	1	-0.050	-0.029	-0.005	0.041	-0.006	0.028	0.116	-0.005	0.033
Infl. exp.	-0.050	1	0.730	0.082	-0.161	0.110	-0.022	-0.120	-0.166	0.010
Infl. perc.	-0.029	0.730	1	0.057	-0.149	0.120	-0.010	-0.150	-0.150	-0.007
Inflation	-0.005	0.082	0.057	1	0.003	0.004	0.007	0.013	-0.057	-0.006
Age	0.041	-0.161	-0.149	0.003	1	-0.166	-0.328	0.011	-0.055	-0.050
Gender	-0.006	0.110	0.120	0.004	-0.166	1	-0.207	-0.017	-0.127	0.072
Employment	0.028	-0.022	-0.010	0.007	-0.328	-0.207	1	0.138	0.256	-0.068
Education	0.116	-0.120	-0.150	0.013	0.011	-0.017	0.138	1	0.258	0.089
Income	-0.005	-0.166	-0.150	-0.057	-0.055	-0.127	0.256	0.258	1	-0.024
Town size	0.033	0.010	-0.007	-0.006	-0.050	0.072	-0.068	0.089	-0.024	1