Emil Verner

The Debt-Inflation Channel of German Hyperinflation

On Thursday, March 23, Emil Verner joined Markus' Academy for a lecture on The Debt-Inflation Channel of the German Hyperinflation. Verner is the Class of 1957 Career Development Professor and an Assistant Professor of Finance at MIT Sloan.

A few highlights from the discussion:

- **A summary in three bullets:**
    - The German inflation of 1919-1923 is a key event in monetary history. From a value of 4.2 marks per dollar on the eve of World War I, the mark depreciated to 4.2 trillion marks per dollar by November 1923.
    - It is a case study to understand how a large inflationary shock is transmitted to the real economy through a "debt-inflation" channel. With long-term nominal debt contracts, unexpected inflation can redistribute wealth from creditors to debtors. If firms are financially constrained, such wealth redistribution can affect real economic activity, even when wages and prices are fully flexible.
    - Newly digitized firm-level data reveals a significant decline in the bankruptcies and leverage of nonfinancial firms during the inflation. Firms that have more nominal liabilities at the onset of the inflation become more valuable in the stock market, face lower interest payments, and increase their employment once the inflation starts.

- **[0:00] Introduction**
    - Today we will learn about the German inflation of 1919-1923. One of the "Four Big Inflations" that Dornbush (1985) studied
    - He called hyperinflationary periods "the laboratory of monetary economics," and emphasized the fiscal-monetary interaction and the importance of political credibility
    - Sargent (1983) is also a classic reference studying the period, and focused on the FX market
- **[4:49] Motivation: how does inflation transmit to the real economy?**
    - We want to study the debt-inflation channel, where unexpected inflation can lead to wealth redistribution in favor of net nominal debtors
    - How important is this financial channel relative to the standard New Keynesian price/wage rigidities?
    - Study the German economy during 1919 - 1923 using newly digitized micro data
    - Evidence of the debt-inflation channel: large falls in leverage and bankruptcies. High leverage firms boost employment, and the ratio of their market to book value grows

    - When inflation is low, inflation boosts output by reducing real wages. However, we see that the speed of wage and price adjustment is increasing with inflation. With a high inflation, prices and wages become quite flexible, rendering the financial channel as the only one boosting output
- **[17:23] Historical background**
    - Weimar Germany abandoned the gold standard in 1914 to finance their war deficits. However inflation did not rise until much later.
    - Fiscal factors: reparations and deficits. When inflation began, real value of tax collection declined, increasing deficits: “Tanzi effect”
    - Political economy: fears of revolution, inability to raise taxes and cut spending
    - Monetary expansion: low discount rates to finance governments and commercial bonds.
    - Balance of payments: paying reparations in foreign currency depreciated the mark, which fueled inflation.
    - Two key periods:
        - High inflation from November 1918 to June 1922. Inflation was unanticipated, and depositors kept their money in their banks. Bank credit was largely available. German economy did quite well.
        - Hyperinflation from July 1922 to November 1923. Expectations become unanchored, leading to a flight from the mark and a credit crunch. Collapse in output in 2023 with the Ruhr crisis, rising discount rates, and fiscal consolidation
- **[32:36] Newly digitized firm-level data**
    - Balance sheets and income statements of about 700 firms. Employment (for 300 firms), bond issuances, and stock prices were also collected
    - Challenge: inflation distorts accounting, especially in 1923. As a result we look at revalued “goldmark” statements
    - Leverage decreased from 1919-1924, along with interest expenses. This was not true for salaries and materials
    - Reduction in real debt burdens is associated with a decline in likelihood of financial distress. However this is only for lower levels of inflation.
    - As inflation rises, the frequency with which wages and prices are updated rises. With high inflation, they are essentially flexible. This is consistent with state-dependent menu cost models; see Alvarez et al. (2019)
    - 51% of firms had fixed rate bonds. Typical coupon at 4.5%. Typical remaining maturity is 20 years. So on the traded bond side firms are really benefiting from inflation. This is less clear in terms of bank lending, it seems banks largely pegged rates to the central bank’s discount rates (which stayed low for long)
- **[46:35] The evidence of the debt-inflation channel**
    - Regression to study the employment effects over time of a firm’s leverage at the beginning of the inflationary period
    - Employment rose until 1922, contracted slightly after; highly leveraged firms made the biggest expansions in employment

    - Firms that had higher leverage performed relatively better in the stock market (even if stocks in general performed poorly). This provides strong evidence that there is redistribution from debt to equity holders
    - We see the strongest employment growth and interest expense declines in firms with a greater share of long-term debt
- **[1:00:50] Key takeaways**
    - Evidence of that the debt-inflation channel (redistribution toward net debtor firms) has real aggregate effects on the economy
    - A partial equilibrium estimation suggests that this debt-inflation channel is expansionary, accounting for 75% of the total employment increase during this period
    - However, we should be conscious of external validity. The relevant channels (e.g. sticky prices) may differ with smaller inflations, the structure of debt contracts, or a different response by the central bank affecting financial conditions

Timestamps:

[0:00] Introduction
[4:49] Motivation: how does inflation transmit to the real economy?
[17:23] Historical background
[32:36] Newly digitized firm-level data
[46:35] The evidence of the debt-inflation channel
[1:00:50] Key takeaways