



Money growth and inflation: Policy lessons from a comparison of the US since 2008 with hyperinflation Germany in the 1920s



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HIGHLIGHTS

- Comparing inflation in post-Lehman US and in hyperinflation Germany for identical base expansion.
- Inflation many folds higher in Germany which appears to be puzzling for quantity theory of money.
- A resolution in terms of the quantity theory.
- Other background institutional and political factors.
- Implications for monetary policy

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ABSTRACT

The quantity theory of money implies that sustained inflation requires a sustained increase in the money supply. It does not, however, imply that all increases in the money supply are inflationary. This letter explores and illustrates this issue by comparing the inflationary consequences of the same base expansion in the US following the collapse of Lehman Brothers with Germany's hyperinflation experience after WWI. A key factor explaining the vastly different inflation experiences between those two episodes is how the monetary expansion translated into demand. The Fed's base expansion did not translate into demand for goods and services since most of it was absorbed by a huge increase in demand for liquidity by financial institutions. By contrast, the German monetary expansion was immediately translated into demand for goods and services since it was motivated by government's hunger for seigniorage revenues.

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The famous (Friedman, 1963) dictum “Inflation is always and everywhere a monetary phenomenon”, by Milton Friedman succinctly summarizes a basic implication of the quantity theory of money for the relation between money and prices. It has been an empirical beacon for generations of students of inflation as well as for central bankers. Translated into more precise terms, it implies that a necessary condition for sustained inflation is a sustained increase in the quantity of money. But it does not imply that all persistent increases in the quantity of money are necessarily inflationary. In particular, when increases in money supply are matched by increases in money demand even the simple quantity theory implies that the price level should not change. More gen-

erally whether persistent monetary expansion induces persistent inflation depends on a number of additional economic and institutional factors that transcend the run of the mill quantity theory of money.¹

This letter illustrates and discusses those issues, first by documenting the dramatic difference between US inflation since Lehman's collapse and inflation during the first half of the post-WWI German hyperinflation for identical rates of expansion of high-powered money, and second, by analyzing the reasons for this difference.

¹ More sophisticated versions of the quantity theory accommodate some but not all of those factors. An early example is Cagan (1956) who explicitly recognizes the effects of changing expectations on velocity and the dynamics of inflation.

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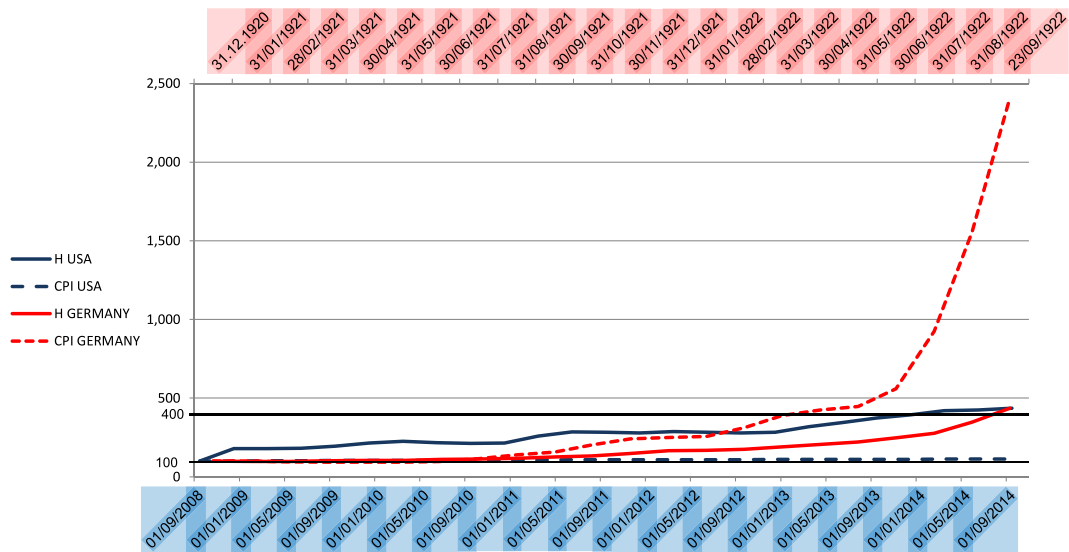


Fig. 1. The behavior of the monetary base and the price level in the US since Lehman's collapse and during the German Hyperinflation: A comparison.² Source: (i) *H* and CPI for USA: Federal Reserve Bank of St. Data Base (ii) *H* and CPI for Germany: Calculated from data in Table 1 of Cukierman (1988).

1. Inflationary consequences of the same money base expansion: hyperinflation Germany versus the US in the aftermath of Lehman's collapse

Fig. 1 displays the evolution of high-powered money and inflation in the US starting in September 2008 till September 2014 and in Germany starting from December 1920.³ The values of the monetary bases and of the price levels in both the US and Germany are normalized to 100 at the beginning of each of those two periods in order to provide a common comparative scale for the two episodes.⁴ For the same reason, the initial periods of the two episodes are located at the same extreme left-hand sides of the horizontal axis, where the chronological dates for the US are displayed on the lower horizontal axis and those for Germany on the upper horizontal axis.

Between September 2008 and September 2014 base money in the US increased by a factor of 4.35 (435%). In order to compare the inflationary consequences of the same base money expansion in today's US with those of the German hyperinflation 90 years ago; the German data is truncated when the cumulative rate of base money expansion equals that of the US between September 2008 and September 2014. This occurs in September 1922, which is about 15 months prior to the end of the hyperinflation. The figure essentially replaces chronological time with time units anchored on identical rates of base money expansion. The blue and red lines in Fig. 1 refer to the US and Germany respectively. The solid lines stand for the evolutions of the base money stocks and the dashed lines for the evolution of the price levels, all in comparison to their respective base periods. Consequently a point on any of the curves shows by how much high powered money or the price level have increased in comparison to their common base period.

For Germany the figures show that, following a period of about seven months during which the price level increased less than high-powered money, there was a persistent acceleration of

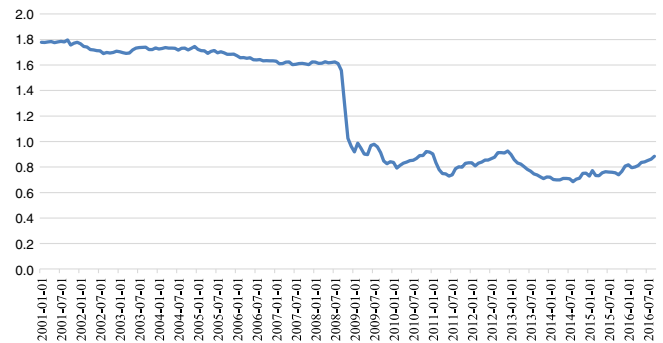


Fig. 2. Behavior of the US monetary multiplier (January 2001–September 2016). Source: Calculated from data on the monetary base and M1 from the Federal Reserve Bank of St Louis monetary data base.

inflation much beyond the rate of base money expansion. As a result, the German price level in September 1922 was 24 times higher than in December 1920. During the same period, base money increased only by a factor of 4.35. By contrast, in the US the cumulative rate of increase in the price level is consistently much lower than the cumulative rate of base expansion. The cumulative CPI increase between Lehman's collapse and September 2014 is 12.4%. This is obviously miniscule in comparison to the 435% increase in the monetary base.

What are the reasons for this dramatic difference in inflation outcomes? The most important economic reason is that, in post Lehman's US, expansion of the base was hardly translated into higher demands for goods and services, while in Germany during the twenties practically all the expansion in high-powered money was used from the start by Government to finance the state budget.⁵ In the US since September 2008 about three quarters of the huge monetary base expansion took the form of an increase in bank reserves at the Fed without any appreciable impact on credit growth. As a consequence, higher order monetary stocks in the public's portfolio and (relatedly) the transmission to the demand for goods and services was much weaker than suggested at first

² The values of the monetary bases and of the price levels US and Germany are all normalized to 100 beginning of each of two periods (Sept 2008 for the US and December 1920 for Germany).

³ Cagan (1956) estimates the semi elasticity of the demand for money during the German hyperinflation using data between September 1920 and July 1923 (Table 3 in Cagan op. cit.).

⁴ Hence, by construction all four graphs start from a common base of 100.

⁵ In Cukierman (1988, 47), I calculate that during 1921, 1922, and 1923, seigniorage financed 56%, 64%, and 89% of the German Government budget, respectively.

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