Expansionary Credit, Easy Money, and Boom-bust Cycles, 1868–1970

Causality Analysis with Impulse Response

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We perform causality analyses using Vector Autoregression and Impulse Response on M2 monetary policy (M2) and real Gross Domestic Product (RGDP) time series spanning a century. We measure whether heterodox views on expansionary credit and business cycles hold merit. Contrary to canonical views, we find that expansionary M2 creates an initial positive impulse response in RGDP, followed by a sharp decline. This study contributes to Cliometric literature by using standard time series analytic tools on historical data spanning far longer than most analyses, tackling a question oft-ignored.

JEL Classification:

1. Introduction

Two competing views on the Great Depression's causes hold prime attention. One view, called the *Keynesian* view after John Maynard Keynes, claims that lower demand lead to a general glut. Keynesian thinking led to current policy practices of government spending to boost employment. This new practice did away with old views on Say's law and changes in price serving to rapidly equilibriate the market. The other view, called *Monetarist*, claims that monetary contraction caused financial institutions to crumble. Deflation followed, causing the economy to contract in turn.

Outside these views lie certain heterodox positions. We focus on one, namely the Austrian view. Expansionary credit and easy money take the blame here, as economic figures get distorted by inflation. Businessmen who rely on interest rates and other figures misallocate their resources, and these malinvestments build up over time until a bust happens. Recessions occur as a correction to let prices properly adjust to consumer preferences.

2. Literature Review

2.1. The Great Depression

Two pieces of literature give main points for canonical views. Keynes (1932) attributes the Great Depression to a general fall in demand. He notes that the money value of all goods had fallen, despite labor still working on lower wages. He notes that that panic selling only caused assets to devalue further, and liquidity has taken too much clout. Indeed, his earlier work Keynes (1923) cites that while prices may equilibriate in the long run, government action could bring back prices to equilibrium much faster. Keynes's ideas helped enthrone increased demand as policy to prevent another depression.

Meanwhile, Friedman and Schwartz (2008) in *A Monetary History of the United States* discuss the role of money in the Great Depression. They begin discussion with a similar event a century before, during a domestic monetary crisis over the Second Bank of the United States. This crisis caused one-fourth of all banks to shut down, with the money suply falling by a third. Initial government response to the Great Depression's onset echoed earlier efforts: new monetary institutions, expanded specie distributor powers. The onset, however, broke confidence in monetary policy. Friedman and Schwarz, however, point the blame to the Federal Reserve's passivity in crisis. In 1931, money income had already decreased to pre-1917 levels, with real income following suit two years later. Two decades of economic gain reversed in four years. What fell faster than both, however, was money stock. From 1929 to 1933, the money stock fell at ten percent per year. Money velocity, which price was proportional to, followed suit by one-third in total for those four years. Men and machines would sit idle as prices decreased, causing the crash. Friedman and Schwarz would be influential in stopping 1970s stagflation, promoting Monetarism in contrast to Keynesianism.

2.2. Expansionary Credit

Sennholz (1988) summarizes heterodox views using historical antecedents. Economic busts through American history, he notices, always followed a period of expansionary credit. The initial boom brought by easy lending and credit would precipitate maladjustments and poor investments from misleading interest rates. Sennholz notes this pattern from the earliest American bust, in 1819–1820, all the way to the Great Depression. While Friedman and Schwarz note that the Federal Reserve undertook monetary contraction, Sennholz points to the reality of lagged effects—throughout the 1920s, the Federal Reserve recklessly expanded credit and money. In 1924–1925, four billion dollars were printed. This policy would continue until 1929, when the Wall Street Crash happened. In the meantime, this period of reckless expansion gave false signals to entrepreuners who would act on them. Black Tuesday only publicized what many had known by then—conditions were not what they seemed.

Rothbard (1972) goes further and counters Keynes's claims. While the latter prioritizes investment over savings to prevent another glut, Rothbard notes that both are determined only by individual time preference and intertemporal discounting. Rothbard also dispenses of Keynes's claim that lower wages would fail in easing unemployment. He notes that during recessions, real wages would actually increase as prices would fall. He notes that Keynes confuses wage rates with income, and falling wage rates would decrease unemployment if laborers were willing to bear with temporarily lower wages. Rothbard then notes that far from laissez-faire, the government's first actions were wildly interventionist, only prolonging the slump.

In another work, Rothbard (2009) proposes that government intervention through central banking and credit expansion alone cause recessions, and the business cycle would be more stable if left alone. Otherwise, easy money causes businesses to happily borrow at low interest rates, the latter misleading them. This easy money causes complacency in saving, increasing time preference and encouraging spending. A recession occurs since no one has saved for a rainy day. The Keynesian method of countercyclical spending is a solution to a false problem, since Rothbard notes that credit expansion alone causes this need.

3. Methods and Data

3.1. Data

Our data for M2 money supply comes from the American Bureau of the Census (of the Census, 1975), which published historical statistics from the 19th century to then present times. Relevant values range from 1868 to 1970. Our data for RGDP comes from the Maddison Center (Maddison, 2006). We took the added real GDP for each year from 1868 to 1970, ensuring stationarity. These long-term datasets provide enough information to analyze causal effects.

3.2. Lagged Effects

We base our methods' exposition on Hamilton (2020). Since the Austrian view contends that credit expansion would not be felt until later, econometric methods concerning lagged effects fit this problem perfectly. We utilize a second-order two-equation Vector Autoregression, or a $VAR(2)$ model, to determine what effects each lag of our time series have:

$$\vec{y}_t = \begin{bmatrix} y_{1,t} \\ y_{2,t} \end{bmatrix} = \sum_{p=1}^{2} \vec{A}\vec{y}_{t-p} + \vec{\varepsilon} = \sum_{p=1}^{2} \begin{bmatrix} a_{1,1} & a_{1,2} \\ a_{2,1} & a_{2,2} \end{bmatrix} \begin{bmatrix} y_{1,t-p} \\ y_{2,t-p} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \end{bmatrix} \tag{1}$$

We justify our use of order $p = 2$ with the Aikake Information Criterion, which determines goodness of fit relative to other lags.

3.3. Impulse Responses

Suppose two random variables Y and M over discrete time. For a time period t, we can express $y_t \in Y$ as a linear function of previous time periods y_{t-1}, y_{t-2} and historical values of $w_i \in W$:

$$y_t = \sum_{p=1}^{2} \phi_1 y_{t-p} + w_t \tag{2}$$

Rewriting this equation with matrix notation,

$$\begin{bmatrix} y_t \\ y_{t-1} \end{bmatrix} = \begin{bmatrix} \phi_1 & \phi_2 \\ 1 & 0 \end{bmatrix} \begin{bmatrix} y_{t-1} \\ y_{t-2} \end{bmatrix} + \begin{bmatrix} w_t \\ 0 \end{bmatrix} \tag{3}$$

For a one unit increase in w_t, we get our *impulse response*

$$\frac{\partial y_{t+j}}{\partial w_t} = \phi_1^j + \phi_2^{j-1}. \tag{4}$$

This value allows us to gauge the effect of a shock in one variable on another. In our case, impulse responses allow a neat analysis of how credit expansion would affect RGDP.

4. Results

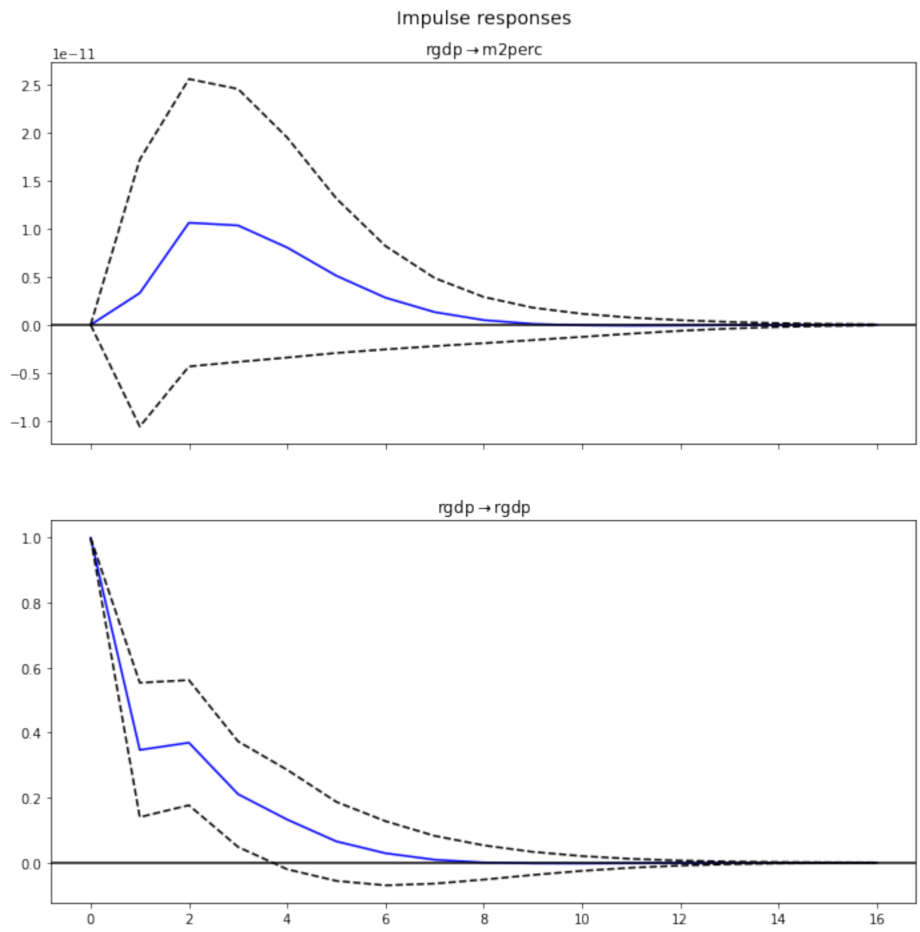

Figure 1: Impulse response for annual RGDP change

All relevant estimates in our appendix. We see in our VAR estimate that M2 remained relatively unresponsive to both itself and to RGDP. The latter variable had a small, short-lived impulse response on the former. Likewise, M2 had a similar impulse response from itself. The opposite equation is where our real interest lies. RGDP gives an erratic impulse response to M2 percent increases—an initial positve response, followed by a sharp decline. Recovery from

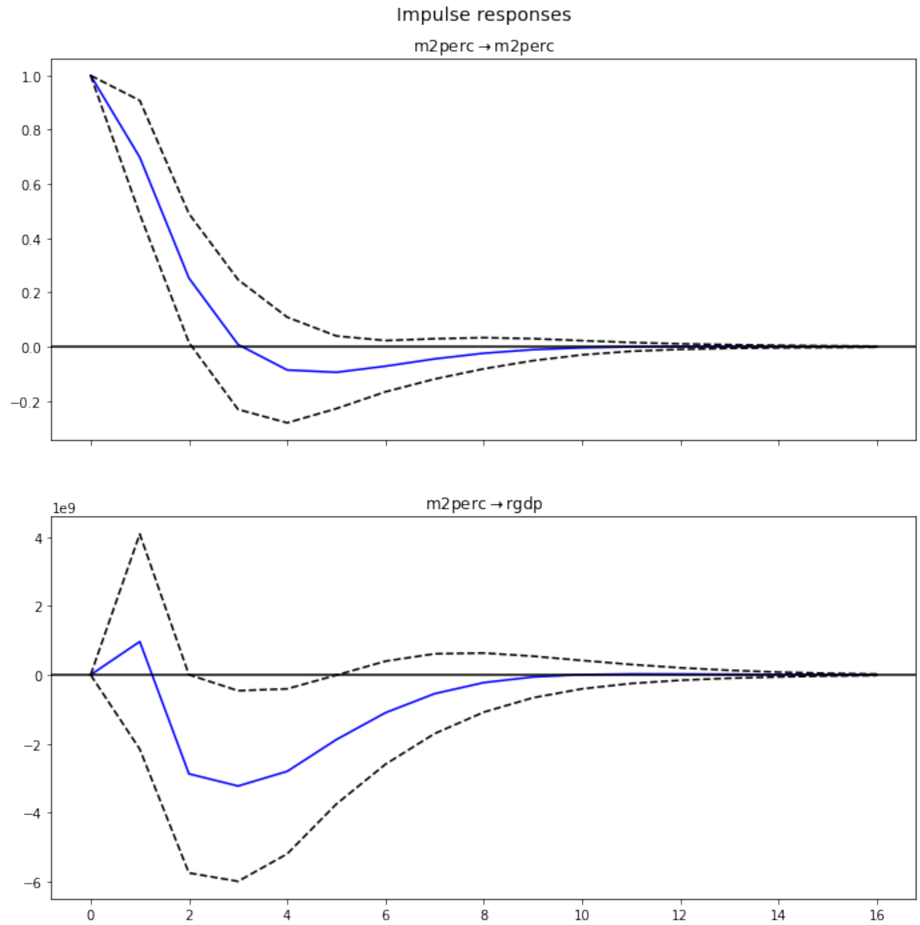

Figure 2: Impulse response for M2 percent increase

this takes up to 15 years, with any gains having been lost. Admittedly, the confidence bounds are wide. However, even in the best case scenario, percent increases in the M2 money supply cause a sharp crash from any gain obtained, even dipping below the original RGDP value. Our VAR estimates lend a similar interpretation. The first lag of M2 percent increases is positive, although statistically insignificant. The second lag is negative, with high significance. This lends credence to Austrian views of the business cycle: credit expansion initally causes a surge in real economic activity. However, malinvestment and misleading information eventually cause a crash. Recessions serve as correction and adjustment periods, with recovery taking long.

5. Final remarks

We find that percent changes in M2 money supply cause initially positive impulse response from changes in real GDP, but then sharply negative ones afterwards. In our simulation, it took 15 years for a recovery. We note that our findings used data from a different period, without fiat currency, quantitative easing, or other innovations in monetary policy. Additionally, our findings concern effects on changes in real GDP, not direct changes on real GDP itself. Finally, our impulse response graph should not be taken as a literal representation of reality. The 15-year recovery time plotted may have been skewed by the Great Depression. However, our analysis serves as a contribution to econometric analysis of monetary history and economic history, with findings going against common wisdom. Other studies may use more sophisticated models to refine our results.

A. Stationarity tests

Since we use time series data, we need to ensure that no unit root exists to prevent spurious regressions. Our results show that neither M2 nor first-differenced RGDP has no unit root.

Variable	p-value
M2 percent change	1.59e-06
RGDP Annual Change	9.47e-08

Table 1: Augmented Dickey-Fuller tests for Stationarity.

B. Vector Autoregression

Equation: Percent change in M2 money supply				
Variable	Coefficient	Standard Error	t-statistic	p-value
const	278.5472e-02	741.894e-03	3.755	0.00
M2 (Lag 1)	698.397e-03	106.857e-03	6.536	0.00
RGDP (Lag 1)	0.00	0.00	0.467	0.641
M2 (Lag 2)	-237.754e-03	104.814e-03	-2.268	0.023
RGDP (Lag 2)	0.00	0.00	1.006	0.315
Equation: RGDP Annual Change				
Variable	Coefficient	Standard Error	t-statistic	p-value
const	3665.69e+07	1107.005e+07	3.311	0.001
M2 (Lag 1)	966.26e+06	159.445e+07	0.606	0.545
RGDP (Lag 1)	0.347	0.1055	3.290	0.001
M2 (Lag 2)	-3885.3e+06	1563.96e+06	-2.484	0.013
RGDP (Lag 2)	0.2457	0.106048	2.317	0.020
No. of Equations:	2	BIC:	53.6152	
Observations:	101	HQIC:	53.4611	
Log likelihood:	-2971.12	FPE:	1.48729e+23	
AIC:	53.3563	Optimal lag selection:	2	

Table 2: Results of the $VAR(2)$ estimation.

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