

## Credit bubbles

Credit is the change in private debt over a defined period (normally a year). A credit bubble can be defined as a period of accelerated growth in private debt followed by a contraction.

The concept is a contested one in academic literature. While empirical episodes of credit-instigated increases and declines in economic activity and asset prices are easily identified, providing a theoretical explanation is challenging for Neoclassical economics. Mian & Sufi (Mian and Sufi 2018) is instructive here: they provide strong empirical evidence of correlations between change in household debt 2002-2007 and change in unemployment 2007-2010 in the USA and globally (Mian and Sufi 2018, p. 32, Figure 1), but interpret a credit bubble as either a decline and then rise in interest rate spreads (Mian and Sufi 2018, p. 38), or an exogenous shock to credit supply driven by a “global savings glut” which is later reversed (Mian and Sufi 2018, pp. 47, 50).

The conceptual difficulties arise from the Loanable Funds model of banking that still dominates Neoclassical economics. In this model, which leading central banks have rejected (McLeay, Radia et al. 2014; Deutsche Bundesbank 2017) but which still dominates Neoclassical thought, credit is a transfer of existing money, rather than a creation of new money: as Krugman puts it, “when debt is rising, it’s not the economy as a whole borrowing more money. It is, rather, a case of less patient people ... borrowing from more patient people” (Krugman 2012, p. 147). Difficulties then arise in explaining how this reallocation reduces aggregate demand when the growth in credit reverses, leading to a range of explanations from “implausibly large differences in marginal spending propensities among the groups” (Bernanke 2000, p. 24) to “a friction such as nominal wage rigidity or a lower bound on the real interest rate that prevents the economy from adjusting when credit contracts”, and heterogeneous beliefs (Mian and Sufi 2018, pp. 47, 48), none of which are conclusive.

Post Keynesian economics has also contested the role of credit in aggregate demand within its accepted and institutionally correct model of Endogenous Money (Moore 1979). A debate between Keen, Lavoie, Fiebiger and Palley in the *Review of Keynesian Economics* (Fiebiger 2014; Keen 2014; Lavoie 2014; Palley 2014) led to Keen proposing a resolution (Keen 2015) which explains the direct role of credit in aggregate demand and income in actual banking and the model of Endogenous Money, and its absence in the model of Loanable Funds.

Keen set out income and expenditure between three sectors in a table where each row showed the expenditure by one sector on the other two, and each column showed the net income (the gap between expenditure and income). Each row necessarily sums to zero, illustrating the core macroeconomic principle that expenditure *is* income. Aggregate demand is the negative sum of the diagonal, aggregate income is the sum of the off-diagonal elements, and the two are necessarily equal.

Using uppercase letters ( $A, B, C, D, E, F$ ) to indicate expenditure per year out of existing money by each sector on the other two, the simplest model is of an economy with a fixed money supply and no lending—see **Error! Reference source not found.** Aggregate demand is the negative sum of the diagonal ( $A+B+C+D+E+F$ ), which is necessarily the same as aggregate income, which is the sum of the off-diagonal elements.

Table 1: No credit model in an income-expenditure table

	Sector 1	Sector 2	Sector 3	Sum
Sector 1	$-(A+B)$	A	B	0
Sector 2	C	$-(C+D)$	D	0
Sector 3	E	F	$-(E+F)$	0
Sum	$(C+E)-(A+B)$	$(A+F)-(C+D)$	$(B+D)-(E+F)$	0

Loanable Funds involves one “patient” sector (Sector 2) lending a flow of *Credit* dollars per year to an “impatient” sector (Sector 1), which spends these borrowed funds on Sector 3—see Table 1. Aggregate demand and income here are the same as for **Error! Reference source not found.**, plus Interest. Credit cancels out and plays no role in aggregate demand and income.

Table 1: Loanable Funds

	Sector 1	Sector 2	Sector 3	Sum
Sector 1	$-(A+B+Credit +Interest)$	A+Interest	B+Credit	0
Sector 2	C	$-(C+D-Credit)$	D-Credit	0
Sector 3	E	F	$-(E+F)$	0
Sum	$(C+E)-(A+B+Credit+Interest)$	$(A+F+Interest)-(C+D-Credit)$	$(B+D)-(E+F)$	0

Endogenous money involves the banking sector extending Credit to Sector 1, which spends the borrowed money on Sector 3, and pays interest to the Banking Sector, which spends amounts (G,H,I) per year on Sectors 1,2 and 3. Here Credit does not cancel out: Credit is a component of both Aggregate Demand and Aggregate Income.

Table 3: Endogenous money with an explicit banking sector

	Assets	Liabilities (Change in Deposit Accounts)			Equity	
	$\Delta Debt$	Sector 1	Sector 2	Sector 3	Banking	Sum
Sector 1	Credit	$-(A + B + Credit + Interest)$	A	<u>B+Credit</u>	Interest	0
Sector 2		C	$-(C+D)$	D		0
Sector 3		E	F	$-(E+F)$		0
Bank		G	H	I	$-(G+H+I)$	
Sum		$(C+E+G)-(A+B+Credit + Interest)$	$(A+F+H)-(C+D)$	$(B+D+I+Credit)-(E+F)$	Interest- $(G+H+I)$	0

There is thus a simple and direct link between credit and economic activity, especially when “*the ratio of private debt to GDP grows by 15 to 20 percentage points or more in a five-year period and the ratio of overall private debt to GDP reaches or exceeds 150 percent*” (Vague 2019). Figure 1 shows that the Great Recession fitted Vague’s criteria.

Figure 1: Private Debt and Credit USA since 1945

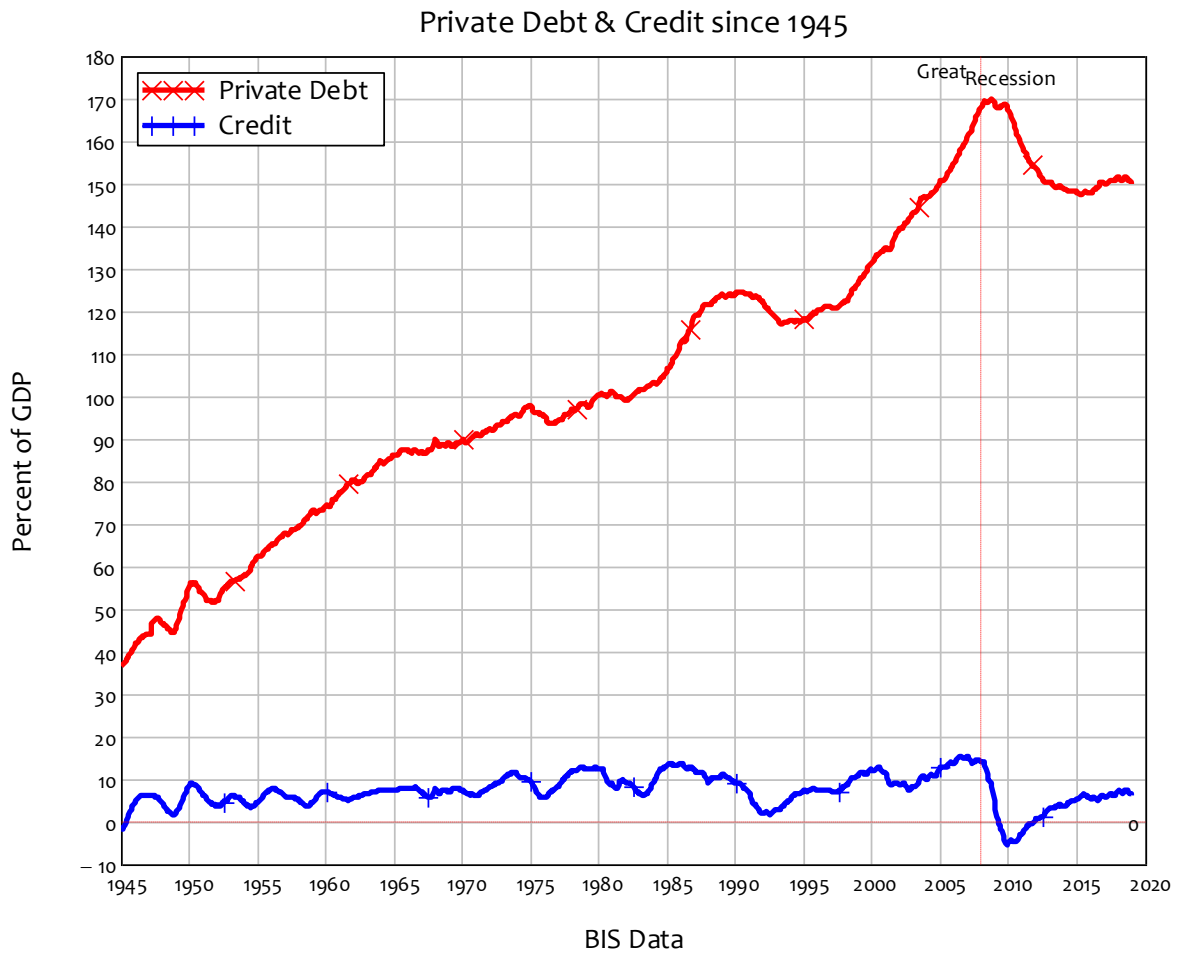
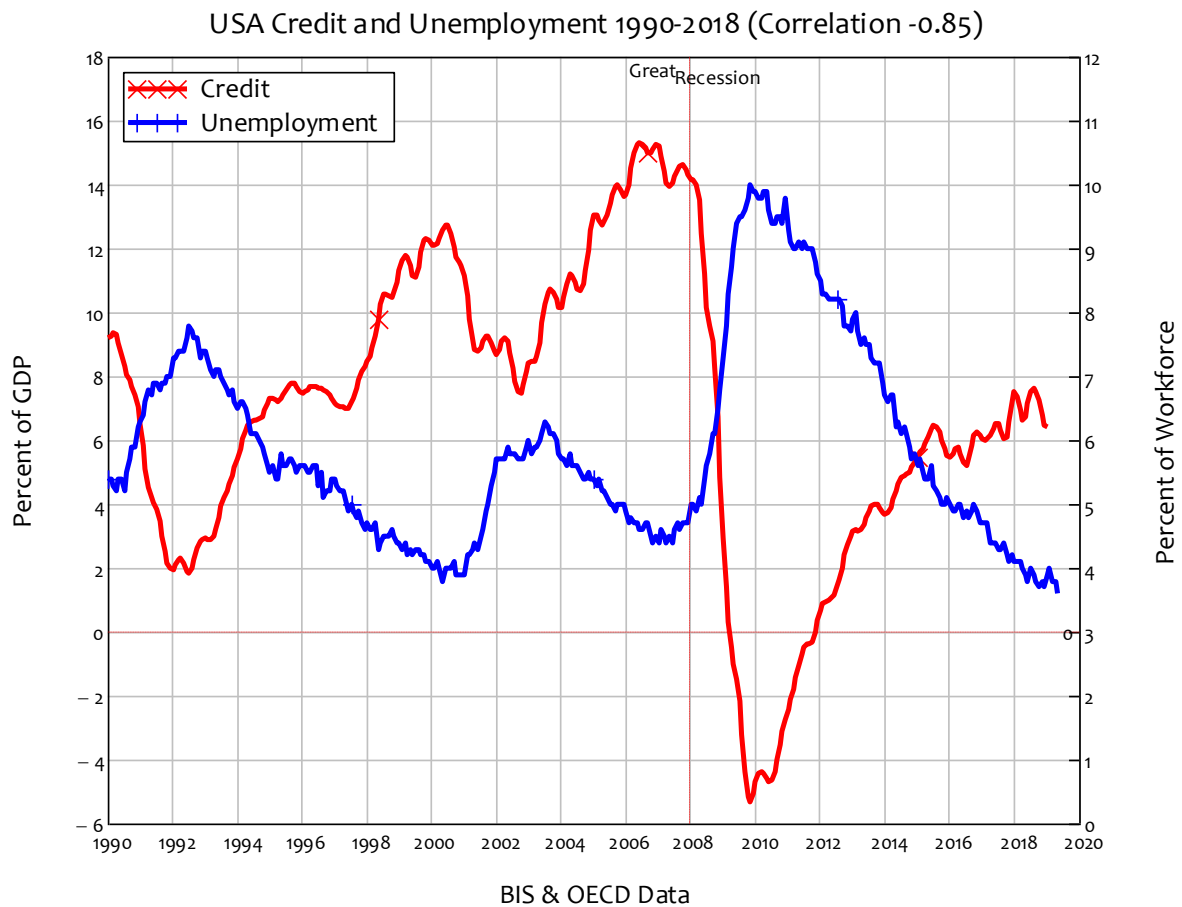


Figure 2 shows the relationship between credit and the level of macroeconomic activity across the Great Recession. Between 2002 and 2008, private debt rose from 140 to 170% of GDP, and credit fell from 15% of GDP at the pre-crisis peak to -5% at the nadir of the Great Recession credit bubble; unemployment fell as credit rose, and vice versa.

Figure 2: Credit and Unemployment are strongly correlated when debt levels are high



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