

Banking Watch

US

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Economic Analysis

US

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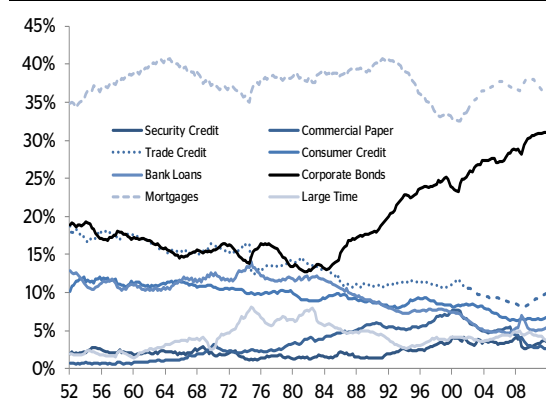
When Credit Breaks Dating Structural Breaks in Credit Data

- Bank mortgage credit and total credit overall are showing their first structural break in history
- Total corporate bonds indicate a structural change to rival the 1987 bond boom
- Commercial and industrial lending appears able to return to its preexisting trend growth rate
- The data cast doubts on expectations of a strong recovery

Executive Summary

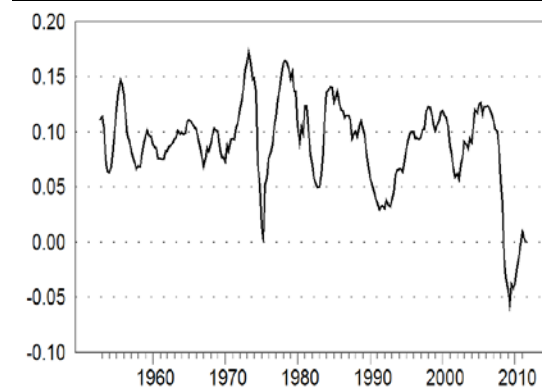
Now that we are several quarters away from the beginning of the financial crisis, it is possible to use statistical tests to investigate structural breaks in credit. The most serious structural breaks unveiled by our process are in corporate bonds, commercial bank residential lending and consumer credit. These breaks suggest that the engine of financial support of the economy over time – corporate bonds – is broken like never before. A structural break in commercial bank residential lending is no surprise given the housing crash, but the confirmation of the break lends credence to the view of low mortgage growth as something not disappearing overnight. Consumer credit's first break in history also suggests less support to consumption from consumer finance than in years past, although consumer credit is recovering better than real estate-related credit. Of note is the finding in our analysis that C&I lending and trade credit are functioning smoothly, an assertion that presents an opportunity for growth to build on business sector activity. In terms of total credit, the data presented above suggests we should not expect anything historically normal from total credit for at least a few more years.

Chart 1
Composition of Total Credit, 1952 to Present, in %



Source: BBVA Research and Federal Reserve

Chart 2
Total Credit, in YoY %



Source: BBVA Research and Federal Reserve

What is credit?

Over the past few years, BBVA Research has categorized US credit in the same way as Blinder (1985) and Bernanke and Blinder (1988). Total credit in the United States, according to Blinder, comprises outstanding corporate bonds, mortgages (subdivided into residential and commercial real estate), bank loans not elsewhere classified (generally bank-based commercial and industrial loans), trade credit, consumer credit, large time deposits, commercial paper and security credit. Residential and commercial real estate may be further subdivided into bank and nonbank credit sources. When first theorizing the effects of a credit crunch on the economy and monetary policy, Bernanke and Blinder used the Federal Reserve's Flow of Funds data to construct this measure of total credit. Large time deposits are included in our concept of total credit since they essentially represent a long-term loan to a bank. This brief focuses on nominal credit, since banking is a nominal business, but we perform all the same tests on GDP deflator-adjusted real credit.

What is a structural break?

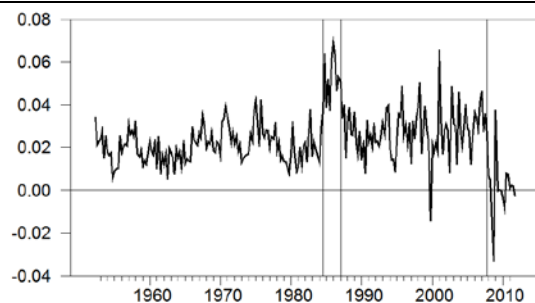
In statistical analysis, a structural break means that the relationship in the data has changed over time. More specifically, a structural break test attempts to see if a breakpoint exists where the coefficients of the data shift from one stable regression relationship to a different one. Two options exist for testing for a breakpoint. For example, a "fluctuation test" may be performed where departures from constancy are witnessed in either the strength of the deviation from the testable implication (or the null hypothesis) of the model or the change in the residuals from the model. This brief uses a second, more tractable approach by Bai and Perron (1999) that allows for multiple structural breaks in the data using the same checks for constancy in the coefficients over time. The key decisions here are the time span between breaks and also the use of a particular information criterion, which is the selection trigger for the test. We use different possible time spans between structural breaks to see if the data is sensitive to this decision. Our information criterion is Liu et al's modified Bayesian information criterion.

What are the results of the break tests?

Starting with the largest credit categories (bonds and mortgages), our tests suggest evidence of a structural break following the financial market dislocations of 2007-2008. For total bonds outstanding, the structural break tests find two breakpoints bracketed during the bond boom of 1985 and 1987. However, during this time period bonds merely shifted into a higher rate of growth and then settled back to their multi-decade trend growth rate. A more significant and third breakpoint is found in 2007. Analysis of real bonds generally confirms these breakpoints. Over the past 50 years, one could reasonably expect a log difference quarterly change of 0.02 in bonds outstanding, but this is now no longer the case. As we have discussed in [previous briefs](#), trends in corporate bonds are affected by extremely low interest rates creating a boom in nonfinancial bonds, but also by fluctuations of foreign firms' issuance in the US and also financial firms' shift away from bonds as a source of funding. Commercial paper, another source of business finance, also demonstrates high levels of fluctuation. We have addressed threshold effects in commercial paper in a previous brief ("Commercial Paper Outlook," 11 April 2001) and thus we can stipulate there are numerous breaks in the data for this form of credit.

Chart 3

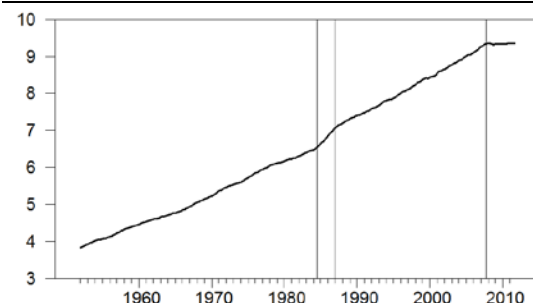
Log Difference in Nominal Bonds Outstanding



Source: BBVA Research and Federal Reserve

Chart 4

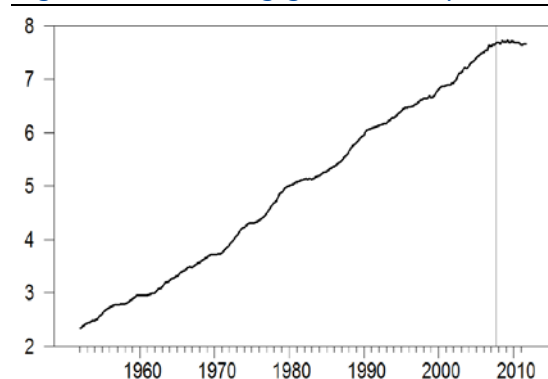
Log of Total Nominal Bonds (lines=breakpoints)



Source: BBVA Research and Federal Reserve

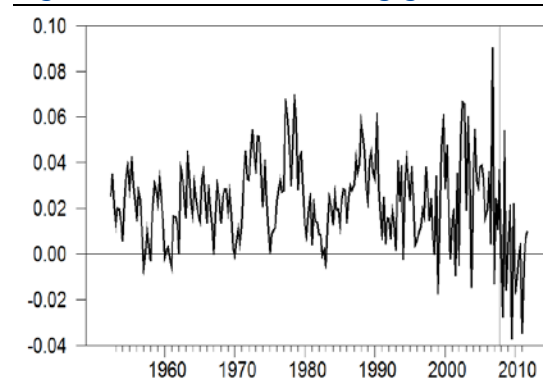
Turning to mortgage categories, our tests of commercial real estate (CRE) suggest breakpoints during the last CRE crisis of the late 1980s and now. Looking at bank-based CRE, the breakpoints are identical, which is unsurprising since banks dominate this particular credit category and securitized CRE credit is not dominant. Interestingly, the results of CRE are unlike those of residential credit. Performing our tests on residential credit outstanding, we find many breakpoints in both the real and nominal data, suggesting considerable variation over the past 50 years. However, when we examine commercial bank-only residential credit, we find that the series is experiencing its first structural break ever, both in the nominal and real data. This suggests that the securitized component of residential mortgages often fluctuates over time, but the first ever break in the commercial banking component suggests how dire the situation is for credit generation in the US. The data also suggests that efforts to revive mortgages and perhaps enact a reversing structural break have yet to bear fruit. The numerous breaks we determine in the total mortgages series (CRE and residential) may therefore be a result of the 1990's CRE crisis and fluctuations in nonbank residential mortgages.

Chart 5

Log of Bank-Based Mortgages (line=breakpoint)

Source: BBVA Research and Federal Reserve

Chart 6

Log Difference of Bank-Based Mortgages

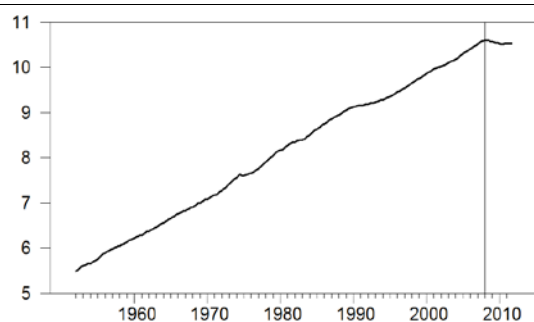
Source: BBVA Research and Federal Reserve

Outside of real estate-related credit, consumer and business lending appears to be improving. Consumer credit, in particular, is strongly affected by immense growth in Federal government consumer credit (student loans). Stripping out this effect, consumer credit is not growing as quickly as one would expect, but it is recovering. According to our break tests of consumer credit excluding government, this credit category is experiencing its first structural break ever, both in nominal and real terms. Turning to commercial and industrial lending (C&I), we perform our tests both on the Flow of Funds series and from the Federal Reserve's H8 data as a cross-check. The results are sensitive to the time span between possible break points, resulting in multiple breaks in the 2000's and alternatively one or two breaks in the 1970s or 80s. The data appear to be suggesting to us that while C&I loans fluctuated a great deal during the 2000's boom, permanent damage to this category of credit is not apparent. This may be the case because C&I loans are not intensively securitized (although collateralized loan obligations do exist). It may also be the case because the credit bubble in real estate did not damage large firms' balance sheets. Combined with low long-term interest rates, a return to trend growth in C&I is achievable.

Interestingly, not all credit categories exhibit a break. For example, trade credit and security credit tests imply no breaks. Trade credit – typically financing provided from a manufacturer to a client for a purchase – is recovering and exhibits no change in trend. Similarly, while security credit – for example, margin financing from a broker-dealer – tends to thrive during stock market booms and fluctuates often, it exhibits no break in trend. Security credit has recovered, although it remains below its pre-crisis peak. Given the extent of leverage during the financial crisis, security credit may take considerable time to return to its peak.

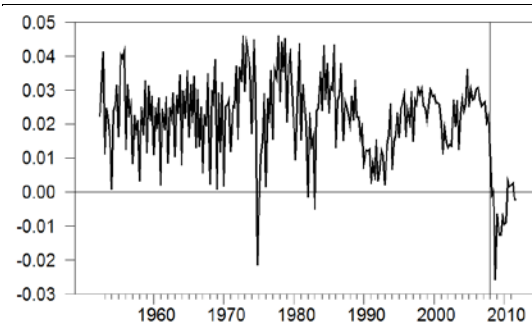
Given the dynamics in each individual component of credit, we next turn to the total series itself. According to the nominal data, total credit in the US is experiencing its first structural break. The contraction of 1974 is notable in the differenced series, but the statistical tests do not suggest this year as a second break. As such, the data's evolution since 2008Q1 is different than the rest of post-war US history. Although we are no longer seeing continued declines in total credit, the strength of the recovery in credit is starting to become less than expected as implied by previous experience. To forecast total credit, we use a VAR based on Bernanke and Blinder (1988). In the past two quarters, this model has shown more serial correlation in its residuals and the forecast error is higher than the actual data. This tendency combined with the structural break evidence suggests the preexisting tendency underpinning the model is breaking down.

Chart 7
Log of Total Credit (line=breakpoint)



Source: BBVA Research and Federal Reserve

Chart 8
Log Difference of Total Credit (line=breakpoint)



Source: BBVA Research and Federal Reserve

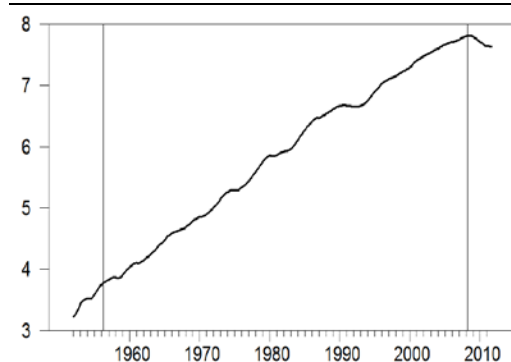
As such, we have a weak growth outlook for total credit. We expect CRE and residential mortgages to continue to decline, although CRE is close to a bottom. Bonds, commercial paper and large time deposits will remain flat, with the latter two categories extremely sensitive to interest rates. Trade credit and C&I lending are growing and will contribute positively to total credit. Consumer credit and security credit have also recovered, although we expect slow growth in consumer credit and volatile growth in security credit. Clearly, with mortgages and bonds representing almost two-thirds of total credit, weakness in these areas will imply weakness in total credit.

Bottom Line: Breaking Bad

Major categories of credit in the United States progressed for decades without any structural change. As the country with the most advanced financial system in the world, the power of financial markets to vet projects, source large amounts of capital, and fund corporations represented a source of strength. The United States' hybrid system of commercial banking and financial markets contrasted with the rest of the world's mostly bank-based financial systems. In the post-war period, certain parts of the financial system may have experienced slowdowns, but other parts of the system held up the entirety of credit. For example, in the early 1990s, consumer and mortgage credit slowed as a result of a swath of bank failures emanating from the savings and loans crisis, but the bond market pushed along. The diversity of the financial system, however, abated after the late 1990's as poorly-designed mortgage securities proliferated. The collapse of the mortgage market and the commensurate leverage cycle that spread through the rest of the economy destroyed collateral across many credit categories. The findings of structural breaks above suggest that important sources of credit in the US such as corporate bonds, consumer credit and bank-based mortgages are showing their first structural break in the history of the US. These findings tend to support the Federal Reserve's cautious outlook and our expectations for sluggish economic growth.

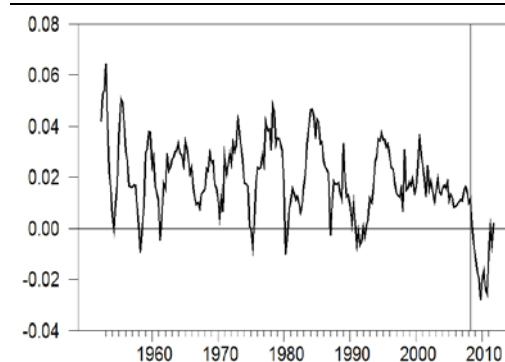
Appendix – Additional Credit Category Break Tests

Chart 9

Log of Consumer Credit Ex Gov't (line=break)

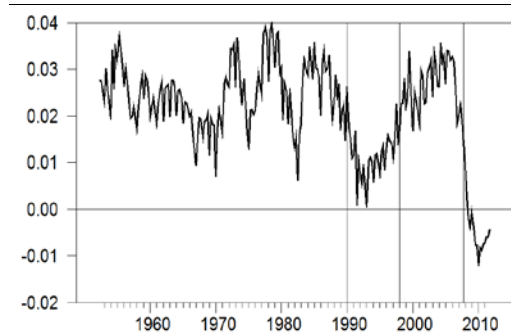
Source: BBVA Research and Federal Reserve

Chart 10

Log Difference Consumer Credit (line=break)

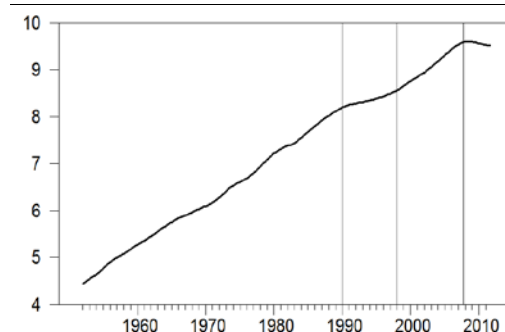
Source: BBVA Research and Federal Reserve

Chart 11

Log Difference Total Mortgages (line=break)

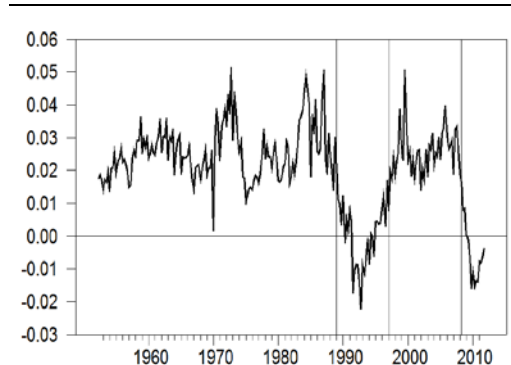
Source: BBVA Research and Federal Reserve

Chart 12

Log Total Mortgages (line=break)

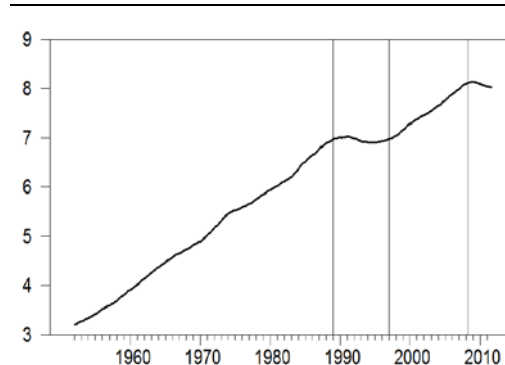
Source: BBVA Research and Federal Reserve

Chart 13

Log Difference of Total CRE (line=breakpoint)

Source: BBVA Research and Federal Reserve

Chart 14

Log of Total CRE (line=breakpoint)

Source: BBVA Research and Federal Reserve

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