Measuring the impact of securitization on imputed bank output

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Abstract

The current National Income and Product Account measure of imputed bank services sold to borrowers is limited to loans retained on the balance sheet. In this paper, we investigate the extent to which the current approach understates nominal bank output by ignoring securitized loans. We document that imputed output is understated by more than 10 percent, but note that this has little impact on final GDP as a large fraction of securitized loans are residential mortgages.

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1. Introduction

The current measure of imputed bank output sold to borrowers in the National Income and Product Accounts recognizes screening and monitoring services sold to borrowers, but is constructed using data on loans retained on bank balance sheets. Given the increased importance of the originate-to-distribute model for commercial banks, we felt it was important to assess whether or not ignoring loans moved off bank balance sheets through securitization has a significantly large impact on the accurate measurement of imputed bank output.

In Section 2, we provide an overview of the current Bureau of Economic Analysis approach to measuring bank output in the National Income and Product Accounts, and a critique of this approach in the academic literature. In section 3, we illustrate the key details of a typical mortgage credit securitization, and discuss implications for the measurement of output. Finally, in section 4, we develop an approach for measuring the imputed output of securitized loans, and document its impact on the measurement of nominal bank output.

2. Measurement of bank output

In this section, we review the current approach to measuring bank output by the Bureau of Economic Analysis in the National Income and Product Accounts, which assumes that the bank's primary activity is traditional deposit-funded lending, and then review a critique of this approach in the academic literature.

2.1 Current Methodology

Framework

The current approach to measuring the service output of commercial banks (as described in Fixler-Reinsdorf-Smith [20030) recognizes that a bank bundles services with both loans and deposits. In particular, interest rates on bank loans are higher than the risk-free interest rate in part due to services like screening and monitoring provided by the bank to borrowers at no direct cost (borrowers in the securities markets pay explicit fees to underwriters and rating agencies for similar services, and this explicit fee income is part of the output of these enitities). Interest rates on deposits are lower than the risk-free interest rate in part due to services like check-writing and ATM access provided by banks to depositors at no direct cost. In order to deal with the bundling of services, the Bureau of Economic Analysis employs a user cost approach to the measurement of banking output.

This approach has its origins in the treatment of fixed capital. The main insight is that in a competitive market with zero economic profits, the owner of a fixed capital asset should be indifferent between either selling the asset today at price p_t or renting the asset for one period at its "user cost," uc_t and selling it tomorrow at p_{t+1}. If the value of the income earned by the asset is expected to depreciate at rate δ_t, the price of the asset is expected to appreciate at gross rate π_t, the risk-free interest rate is r_t, and the rent is paid at the beginning of the period, the user cost can be written as follows:

$$uc_t = p_t - p_{t+1}/(1+r_t) = p_t(r_t-\pi_t+\delta_t)/(1+r_r).$$

Note that the user cost decreases as the price of the asset is expected to appreciate and increases as the asset depreciates more quickly.

Now consider a financial asset with current price p_t and coupon interest rate c_t paid as a fraction of the current price p_t at the beginning of the period. As above, denote the expected gross price appreciation rate as π_t. The user cost of the financial asset can be written as follows:

$$uc_t = p_t - (p_t * c_t + p_{t+1})/(1+r_t) = p_t(r_t-\pi_t+c_t)/(1+r_r).$$

The coupon payment on the financial asset is equivalent to a negative depreciation rate of physical capital.

In order to measure the service output of banks, BEA sets the expected appreciation equal to zero ($\pi_t = 0$) using the arguments that (1) one must treat debtors and lenders symmetrically in the national accounts, and changes in market value only directly affect the lender, accompanied by (2) the exclusion of holding gains and losses excluded from national income and output--credit losses are a form of holding period loss. The assumption of no price appreciation implies that the current price of the asset is equal its initial price, or equivalently the book value of the asset.

It follows that the user cost measured relative to the book value of the asset can be written:

$uc_t/p_t = r_t - c_t$

This expression is a simple interest rate spread. For bank loans, the user cost is typically negative as the interest rate c_t is almost always higher than the risk-free rate of interest due to (a) the risk of default by the borrower and (b) services bundled with the loan. For bank deposits, the user cost is typically positive as the interest rate c_t is almost always lower than the risk-free rate of interest due to (a) the presence of deposit insurance and (b) services bundled with deposits.

Total nominal bank output is measured as the sum of user costs for each bank asset and liability, measured separately, plus any fee income paid by borrowers and depositors for services.

Practical issues in Measurement

The first practical issue is the selection of a risk-free interest rate, denoted the reference rate. This is done using the actual interest paid on bank holdings of U.S. government and agency securities relative to their stock at the beginning of the period.

The second practical issue involves international activities of US and foreign banks. In principal, one needs to include the activities of U.S. offices of foreign banks and remove activities of foreign offices of US banks.

The third practical issue is that interest paid on municipal bonds are typically tax-free, making it necessary to convert banks' exposures into a taxable equivalent basis.

Fourth, banks purchase services from the Federal Reserve which need to be recognized as intermediate inputs into their production.

Finally, it is important to understand the impact of banking activity on overall GDP. Services sold or provided to businesses are intermediate products, and do not affect the measurement of aggregate GDP, though they do affect the division of GDP by industry, and hence play an important role in the analysis of the forces behind overall growth. However, services sold or provided to households (as well as to governments and foreigners) are viewed as final products and add to aggregate GDP (note that imputed services are assumed to be immediately consumed, hence this treatment does not affect the computation of aggregate saving or investment). An important exception to this latter point is mortgage lending to households. In order to measure the flow of services from owner-occupied housing, the BEA treats households as if they were a business, so in this case mortgage lending by banks is an intermediate input into the production of these services.

A critical point is that only on-balance sheet activities of banks are taken into account. Once a bank loan is securitized, the bank is assumed to be no longer providing services to the borrowers (save from items such as the fees that banks may by continuing to service assets they sell into the securities markets); this treatment increases the output of borrowers relative to banks. Moreover, the bank no longer needs to pay depositors to finance the loan; this treatment results in decreasing the implicit service the bank provides to depositors and thus works to lower both bank output and overall GDP.

Implementation

In this section we outline the construction of aggregate imputed bank output using the BEA procedures. We focus separately on commercial banks filing either FFIEC 031 or FFIEC 041 call reports, and bank holding companies filing Y-9C reports over 2001 to 2006.

We start by following the BEA methodology described by Fixler et al (2003) in order to construct imputed output for banks for balance sheet assets. The first step is to compute the reference rate of interest as the interest rate which makes the aggregate bank US Treasury and Agency security portfolio generate zero imputed service. The second step is to measure the spread of interest on each asset above this reference rate and aggregate as imputed output to borrowers. The third step is to measure the spread of the reference rate above interest paid to owners of liabilities and aggregate as imputed output to depositors and other creditors. The final step is to add the imputed output of the bank to borrowers and depositors to compute total imputed bank output. To this point, we are simply replicating BEA methodology on current data.

The current approach to measuring bank output is implemented in the first 28 lines of Table 1. One is able to separate interest income on loans into real estate loans, commercial & industrial loans, credit card balances, other consumer loans, loans to foreign governments, all other loans in domestic offices, and loans in foreign offices. It is also possible to separate interest income on other asset categories including leases, interest-bearing balances, trading assets, securities, federal funds loans and repos, The securities portfolio is divided into US Treasury and Agency securities, mortgage-backed securities, and other securities. The other side of the balance sheet is split up into transaction deposits, savings deposits, large time deposits, small time deposits, foreign deposits, trading liabilities and other borrowed money, federal funds loans and repos, and subordinated debt.

The interest rate is defined by the ratio of interest income over the year reported on Schedule RI for each of these categories to the amount reported on Schedule RC on December 31 of each year. The interest rate on the portfolio of US Treasury and Agency securities is the reference rate, which is 4.35 percent in 2006. This figure is used to construct the spread on each of the interest-earning assets and liabilities.

The table documents almost all of the imputed services sold on the asset side of the balance sheet are to borrowers (mostly real estate, commercial & industrial, and credit cards), and almost all of those on the liability side of the balance sheet are to transaction and saving deposits. About half of imputed output comes from each side of the balance sheet, and they aggregate to just under $295 billion in 2006.

2.2 Wang-Basu-Fernald Critique (2004)

An important recent critique of BEA's treatment of bank output, that of Wang-Basu-Fernald (2004), involves rethinking the services banks provide to borrowers. In this paper, the authors build a general equilibrium model in order to understand how to accurately measure bank output. In the model, banks play an important role in resolving asymmetric information problems between investors and firms. In particular, banks produce services in the form of screening borrowers (in order to assess their probability of default) and to monitor defaulted borrowers (in order to verify the veracity of their disclosures about financial condition). In this sense, a commercial bank can be split up conceptually into a rating agency that produces screening and monitoring services and a corporate bond portfolio.

Table 1: Imputed commercial bank output, 2006

Category	Balance	Interest	Rate	Spread	Output
1. Real estate loans	$ 3,540.25	$ 228.99	6.47%	2.12%	$ 74.99
2. Commercial & industrial loans	$ 987.28	$ 74.18	7.51%	3.16%	$ 31.23
3. Credit card loans	$ 299.40	$ 36.50	12.19%	7.84%	$ 23.48
4. Other consumption loans	$ 468.31	$ 34.30	7.32%	2.97%	$ 13.93
5. Loans to foreign governments	$ 0.40	$ 0.02	4.27%	-0.08%	$ (0.00)
6. All other loans, domestic offices	$ 337.73	$ 19.86	5.88%	1.53%	$ 5.16
7. Loans in foreign offices	$ 421.13	$ 29.89	7.10%	2.75%	$ 11.58
9. Leases	$ 124.14	$ 7.41	5.97%	1.62%	$ 2.01
10 Total loans	$ 6,054.49	$ 423.74	7.00%	2.65%	$ 160.37
11. Interest-bearing balances	$ 155.90	$ 7.79	4.99%	0.64%	$ 1.00
12. US Treasury & Agency securities	$ 327.72	$ 14.26	4.35%	0.00%	$ -
13. Mortgage-backed securities	$ 1,012.94	$ 50.11	4.95%	0.60%	$ 6.05
14. Other securities	$ 265.01	$ 18.28	6.90%	2.55%	$ 6.75
15. Trading assets	$ 620.19	$ 17.96	2.90%	-1.45%	$ (9.02)
16. Federal funds and repos	$ 534.92	$ 21.35	3.99%	-0.36%	$ (1.92)
17. Other assets	$ -	$ 3.39			
18. Total interest-bearing assets	$ 8,971.18	$ 564.26	6.29%	1.94%	$ 174.02
19. Transaction deposits	$ 735.89	$ 3.82	0.52%	3.83%	$ 28.19
20. Saving deposits and MMDAs	$ 2,998.02	$ 55.35	1.85%	2.50%	$ 75.06
21. Large time deposits	$ 1,074.03	$ 43.45	4.05%	0.30%	$ 3.27
22. Small time deposits	$ 944.59	$ 36.13	3.82%	0.53%	$ 4.96
23. Foreign deposits	$ 1,194.04	$ 40.28	3.37%	0.98%	$ 11.66
24. Federal funds and repos	$ 733.26	$ 35.06	4.78%	-0.43%	$ (3.16)
25. Trading liabilities and other borrowings	$ 1,174.74	$ 48.59	4.14%	0.21%	$ 2.51
26. Subordinated debt	$ 149.85	$ 8.59	5.73%	-1.38%	$ (2.07)
27. Total interest-bearing liabilities	$ 9,004.42	$ 271.27	3.01%	1.34%	$ 120.42
28. Total on-balance-sheet imputed output					$ 294.44
29. 1-4 family residential net	$ 739.03			2.12%	$ 15.65
30. Home equity gross	$ 8.90			2.12%	$ 0.19
31. Home equity net	$ 8.03			2.12%	$ 0.17
32. Credit cards gross	$ 362.47			7.84%	$ 28.42
33. Credit cards net	$ 286.92			7.84%	$ 22.50
34. Auto loans gross	$ 16.26			2.97%	$ 0.48
35. Other consumer loans net	$ 28.67			2.97%	$ 0.85
36. Commercial & industrial loans gross	$ 10.54			3.16%	$ 0.33
37. Commercial & industrial loans net	$ 7.94			3.16%	$ 0.25
38. Other loans net	$ 144.94			2.65%	$ 3.84
39. All loans gross	$ 1,310.82				$ 49.77
40. All loans net	$ 1,231.79				$ 43.75
41. All serviced loans	$ 4,697.72	$ 13.55	0.29%		$ 3.78
44. Securitization output					$ 39.97
45. Total imputed bank output					$ 334.41

In the paper, the authors focus on an interesting special case where there are no information problems, so that the bank does not produce any real services to borrowers. However, because the borrower can default, the interest rate on a loan will be larger than the risk-free rate by the amount required to compensate the lender for the systemic risk associated with the loan (i.e. the covariance of the default rate with the marginal utility of consumption). The authors point out that there is an inconsistency in the measurement of the output of a firm which borrows from a bank and a firm which borrows in the corporate bond market. In the former case, compensation for default risk is counted as imputed output produced by the bank, but in the latter case it is not. Consequently, the distribution of financial and nonfinancial output depends in part on the allocation of credit risk between banks and the rest of the financial sector of the economy. Since it is

somewhat hard to think that loans made by a bank involve substantially different services than loans made in any other way this is difficult to accept.

The authors argue that in order to be consistent, it is necessary to remove this risk premium from interest rate spreads calculated in order to measure imputed bank output sold to borrowers. In a more recent paper, Basu, Inklaar, and Wang (2006) implement this correction for a sample of bank holding companies, and document that the current BEA measure overstates imputed bank output by almost 20 percent.

3. An overview of mortgage credit securitization

Before addressing how the securitization process would impact the measurement and interpretation of aggregate bank output, we find it useful to spend some time working through the details of a typical mortgage securitization. This is done for three reasons. First, securitization is an attempt to break apart all of the services performed by a bank into separate services, which are then performed by different parties. Given the debate in the current academic literature over what is the right way to measure bank output, this seems like a useful starting point. Second, we hope to convince the reader that the services purchased by the borrower of securitized loan are more than just servicing, and thus the current treatment of securitized loans in the National Accounts, which just uses servicing fee income, is inadequate. Finally, we hope that this discussion helps the reader understand that the proposed use of senior-tranche mortgage-backed security (MBS) coupon rates as a risk-adjusted reference rate for real estate loans, and a similar use of senior-tranche asset-backed-security (ABS) coupon rates for consumer loans, respectively, is inappropriate.

3.1 The mortgage pool

In order to keep the discussion from becoming too abstract, we find it useful to frame many of these issues in the context of a real-life example taken from Ashcraft and Schuermann (2007). In particular, we focus on a securitization of 3,949 subprime loans with aggregate principal balance of $881 million originated by New Century Financial in the second quarter of 2006.[1]

In each of the years 2004 to 2006, New Century Financial was the second largest subprime lender, originating $51.6 billion in mortgage loans during 2006 (Inside Mortgage Finance, 2007). Volume grew at a compound annual growth rate of 59% between 2000 and 2004. The backbone of this growth was an automated internet-based loan submission and pre-approval system called *FastQual*. The performance of New Century loans closely tracked that of the industry through the 2005 vintage (Moody's, 2005b). However, the company struggled with early payment defaults in early 2007, failed to meet a call for more collateral on its warehouse lines of credit on 2 March 2007 and ultimately filed for bankruptcy protection on 2 April 2007. The junior tranches of this securitization were part of the historical downgrade action by the rating agencies during the week of 9 July 2007 that affected almost half of first-lien home equity asset-backed securities (ABS) deals made in 2006.[2]

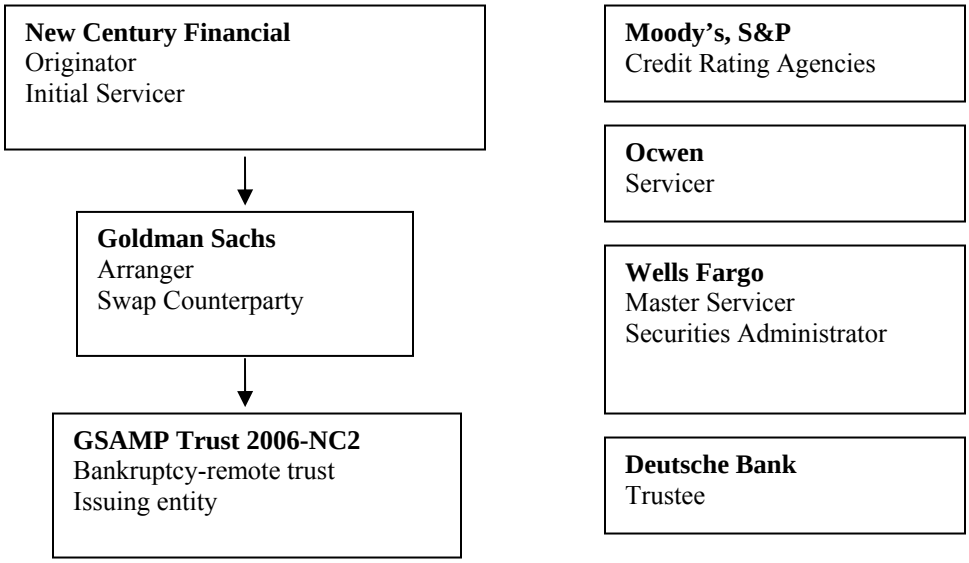
As illustrated in Figure 1, these loans were initially purchased by a subsidiary of Goldman Sachs, who in turn sold the loans to a bankruptcy-remote special purpose vehicle named GSAMP TRUST 2006-NC2. The trust funded the purchase of these loans through the issue of asset-backed securities, which required the filing of a prospectus with the SEC detailing the transaction. New Century serviced the loans initially, but upon creation of the trust, this business was transferred to Ocwen Loan Servicing, LLC in August 2006,

[1] The details of this transaction are taken from the prospectus filed with the SEC and with monthly remittance reports filed with the Trustee. The former is available on-line using the Edgar database at http://www.sec.gov/edgar/searchedgar/companysearch.html with the company name GSAMP Trust 2006-NC2 while the latter is available with free registration from http://www.absnet.net/.

[2] A careful reader might note that New Century is not a commercial bank. However, there is very little difference in the securitization process for banks and non-banks. Moreover, this illustrates the growing importance of non-banks in the intermediation of credit, suggesting the need for the national accounts to recognize services sold to borrowers by non-bank financial institutions.

who receives a fee of 50 basis points (or $4.4 million) per year on a monthly basis. The master servicer and securities administrator is Wells Fargo, who receives a fee of 1 basis point (or $881 thousand) per year on a monthly basis.

Figure 1: Key Institutions Surrounding GSAMP Trust 2006-NC2



Source: Prospectus filed with the SEC of GSAMP 2006-NC2

3.2 Credit enhancement

The typical trust has the following structural features designed to protect investors from losses on the underlying mortgage loans:

- Subordination
- Excess spread
- Shifting interest
- Performance triggers
- Interest rate swap

We discuss each of these forms of credit enhancement in turn.

3.2.1 Subordination

The distribution of losses on the mortgage pool is typically tranched into different classes. In particular, losses on the mortgage loan pool are applied first to the most junior class of investors until the principal balance of that class is completely exhausted. At that point, losses are allocated to the most junior class remaining, and so on.

The most junior class of a securitization is referred to as the equity tranche. In the case of subprime mortgage loans, the equity tranche is typically created through over-collateralization (o/c), which means that the principal balance of the mortgage loans exceeds the principal balance of all the debt issued by the trust. This is an important form of credit enhancement that is funded by the arranger in part through the premium it receives on offered securities. O/C is used to reduce the exposure of debt investors to loss on

the pool mortgage loans. The retention of the equity tranche by an originator and/or arranger can be an important mechanism to reduce information problems vis-a-vis investors.

A small part of the capital structure of the trust is made up of the mezzanine class of debt securities, which are next in line to absorb losses once the o/c is exhausted. This class of securities typically has several tranches with credit ratings that vary between AA and B. With greater risk comes greater return, as these securities pay the highest interest rates to investors. The lion's share of the capital structure is always funded by the senior class of debt securities, which are last in line to absorb losses. Senior securities are protected not only by o/c, but also by the width of the mezzanine class. In general, the sum of o/c and the width of all junior tranches are referred to as subordination. Senior securities generally have the highest rating, and since they are last in line (to absorb losses), pay the lowest interest rates to investors.

Table 2: Capital structure of GSAMP Trust 2006-NC2

Tranche description				Credit Ratings		Coupon Rate	
Class	**Notional**	**Width**	**Subordination**	**S&P**	**Moody's**	**(1)**	**(2)**
A-1	$239,618,000	27.18%	72.82%	AAA	Aaa	0.15%	0.30%
A-2A	$214,090,000	24.29%	48.53%	AAA	Aaa	0.07%	0.14%
A-2B	$102,864,000	11.67%	36.86%	AAA	Aaa	0.09%	0.18%
A-2C	$99,900,000	11.33%	25.53%	AAA	Aaa	0.15%	0.30%
A-2D	$42,998,000	4.88%	20.65%	AAA	Aaa	0.24%	0.48%
M-1	$35,700,000	4.05%	16.60%	AA+	Aa1	0.30%	0.45%
M-2	$28,649,000	3.25%	13.35%	AA	Aa2	0.31%	0.47%
M-3	$16,748,000	1.90%	11.45%	AA-	Aa3	0.32%	0.48%
M-4	$14,986,000	1.70%	9.75%	A+	A1	0.35%	0.53%
M-5	$14,545,000	1.65%	8.10%	A	A2	0.37%	0.56%
M-6	$13,663,000	1.55%	6.55%	A-	A3	0.46%	0.69%
M-7	$12,341,000	1.40%	5.15%	BBB+	Baa1	0.90%	1.35%
M-8	$11,019,000	1.25%	3.90%	BBB	Baa2	1.00%	1.50%
M-9	$7,052,000	0.80%	3.10%	BBB-	Baa3	2.05%	3.08%
B-1	$6,170,000	0.70%	2.40%	BB+	Ba1	2.50%	3.75%
B-2	$8,815,000	1.00%	1.40%	BB	Ba2	2.50%	3.75%
X	$12,340,995	1.40%	0.00%	NR	NR	N/A	N/A

Source: Prospectus filed with the SEC of GSAMP 2006-NC2

The capital structure of GSAMP 2006-NC1 is illustrated in Table 2. First, note that the o/c is the class X, which represents 1.4% of the principal balance of the mortgages. There are two B classes of securities not offered in the prospectus. The mezzanine class benefits from a total of 3.10% of subordination created by the o/c and the class B securities. However, note that the mezzanine class is split up into 9 different classes, M-1 to M-10, which class M-2 being junior to class M-1, etc. For example, the M-8 class tranche, which has an investment grade-rating of BBB, has subordination of 3.9% and pays a coupon of 100 basis points. Investors receive 1/12 of this amount on the distribution date, which is the 25th of each month. The senior class (the tranches rated A-1 to A-2D) benefit from 20.65% of total subordination, including the width of the mezzanine class (19.25%).

Note that the New Century structure is broken into two groups of Class A securities, corresponding to two sub-pools of the mortgage loans. In Group I loans, every mortgage has original principal balance lower than the GSE-conforming loan limits. This feature permits the GSEs to purchase these Class A-1 securities. However, in the Group II loans, there is a mixture of mortgage loans with original principal balance above and below the GSE-conforming loan limit.

The table does not list either the class P or class C certificates, which have no face value and are not entitled to distributions of principal or interest. The class P securities are the sole beneficiary of all future

prepayment penalties. Since the arranger will be paid for these rights, it reduces the premium needed on other offered securities for the deal to work. The class C securities contain a clean-up option which permits the trust to call the offered securities should the principal balance of the mortgage pool fall to a sufficiently low level.[3] In our example deal, the offered debt securities are rated by both S&P and Moody's. Note that Table 6 documents that there is no disagreement between the agencies in their opinion of the appropriate credit rating for each tranche.

3.2.2 Excess spread

Subordination is not the only protection that senior and mezzanine tranche investors have against loss. As an example, the weighted average coupon from the mortgage loan will typically be larger than fees to the servicers, net payments to the swap counterparty, credit losses on the mortgage loans, and the weighted average coupon on debt securities issued by the trust. This difference is referred to as excess spread, which is distributed each month to the owners of the Class X securities. Note that this is the first line of defense for investors for credit losses, as the principal of no tranche is reduced by any amount until credit losses reduce excess spread to a negative number. The amount of credit enhancement provided by excess spread depends on both the severity as well as the timing of losses.

In the New Century deal, the weighted average coupon on the tranches at origination is LIBOR plus 23 basis points. With LIBOR at 5.32% at the time of issue, this implies an interest cost of 5.55%. In addition to this cost, the trust pays 51 basis points in servicing fees and initially pays 13 basis points to the swap counterparty (see below), for a total payout of 6.19%. As the weighted average interest rate on collateral at the time of issue is 8.30%, the initial excess spread on this mortgage pool is 2.11%.

More generally, the amount of excess spread varies by deal, but averaged about 2.5 percent during 2006. Dealers estimate that loss rates must reach 9 percent before the average BBB minus bond sustains its first dollar of principal loss, about twice its initial subordination of 4.5 percent in Figure 3 above.

3.2.3 Shifting interest

Senior investors are also protected by the practice of shifting interest, which requires that all principal payments to be applied to senior notes over a specified period of time (usually the first 36 months) before being paid to mezzanine bondholders. During this time, known as the "lockout period," mezzanine bondholders receive only the coupon on their notes. As the principal of senior notes is paid down, the ratio of the senior class to the balance of the entire deal (senior interest) decreases during the first couple years, hence the term "shifting interest". The amount of subordination (alternatively, credit enhancement) for the senior class increases over time because the amount of senior bonds outstanding is smaller relative to the amount outstanding for mezzanine bonds.

3.2.4 Performance triggers

After the lockout period, subject to passing performance tests,[4] the o/c is released and principal is applied to mezzanine notes from the bottom of the capital structure up until target levels of subordination are reached (usually twice the initial subordination, as a percent of current balance). In addition to protecting senior note holders, the purpose of the shifting interest mechanism is to adjust subordination across the capital structure after sufficient seasoning. Also, the release of o/c and pay-down of mezzanine notes reduces the average life of these bonds and the interest costs of the securitization.

In our example securitization, o/c is specified to be 1.4% of the principal balance of the mortgage loans as of the cutoff-date, at least until the step-down date. The step-down date is the earlier of the date on which the principal balance of the senior class has been reduced to zero, or when subordination of the senior class becomes greater than or equal to 41.3% of the aggregate principal balance of remaining mortgage loans, or

[3] The figure also omits discussion of certain "residual certificates" that are not entitled to distributions of interest but appear to be related to residual ownership interests in assets of the trust.
[4] There are two types of performance tests in subprime deals, one testing the deal's cumulative losses against a loss schedule, and another test for 60+ day delinquencies.

36 months. The trigger event is defined as a distribution date when one of the following two conditions is met:

- The rolling three-month average of 60-days or more delinquent (including those in foreclosure, REO properties, or mortgage loans in bankruptcy) divided by the remaining principal balance of the mortgage loans is larger than 38.70% of the subordination of the senior class from the previous month; or,
- The amount of cumulative realized losses incurred over the life of the deal as a fraction of the original principal balance of the mortgage loans exceeds the thresholds in Figure 2.

If the trigger event does not occur, the deal is 36 months old, and the subordination of the senior class is larger than 41.3%, then the deal will step-down. In this case, o/c is specified to be 2.8 percent of the principal balance of the mortgage loans in the previous month, subject to a floor equal to 0.5% of the principal balance of the mortgage loans as of the cut-off date. At this time, any excess o/c is released to holders of the Class X tranche. Note that the trigger event only affects whether or not o/c is released.

3.5. Interest rate swap

While most of the loans are ARMs, as discussed above, the interest rates will not adjust for two to three years following origination. It follows that the trust is exposed to the risk that interest rates increase, so that the cost of funding increases faster than interest payments received on the mortgages. In order to mitigate this risk, the trust engages in an interest rate swap with a third-party named the swap counterparty. In particular, the third-party has agreed to accept a sequence of fixed payments in return for promising to send a sequence of adjustable-rate payments.

In our example, Goldman Sachs is the Swap counterparty, which has agreed to pay 1-month LIBOR and accept a fixed interest rate of 5.45% on a notional amount described in Figure 3 over a term of 60 months. Note that the notional amount hedged decreases over time, as the trust expects pre-payments of principal on the pool of mortgage loans to reduce the amount of debt securities outstanding.

3.6 Other features

The prospectus includes a list of 26 representations and warranties made by the originator. Some of the items include: the absence of any delinquencies or defaults in the pool; compliance of the mortgages with federal, state, and local laws; the presence of title and hazard insurance; disclosure of fees and points to the borrower; statement that the lender did not encourage or require the borrower to select a higher cost loan product intended for less creditworthy borrowers when they qualified for a more standard loan product.

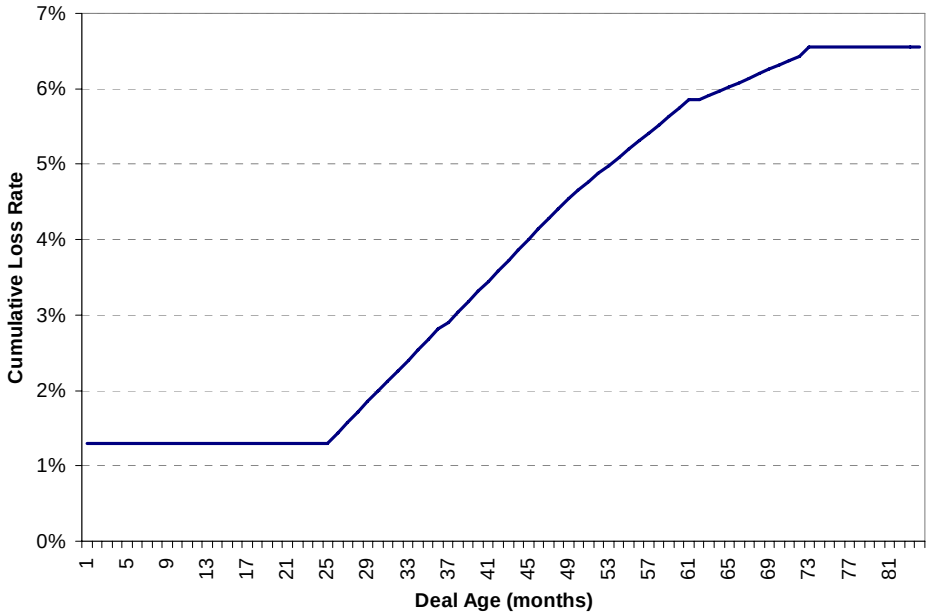
3.7 Discussion

The key insight from the overview of securitization should be that interest collected on mortgage-backed securities is used for the following a diverse number of purposes:

- pay the servicer
- pay the interest swap counterparty
- pay interest on tranches
- absorb credit losses

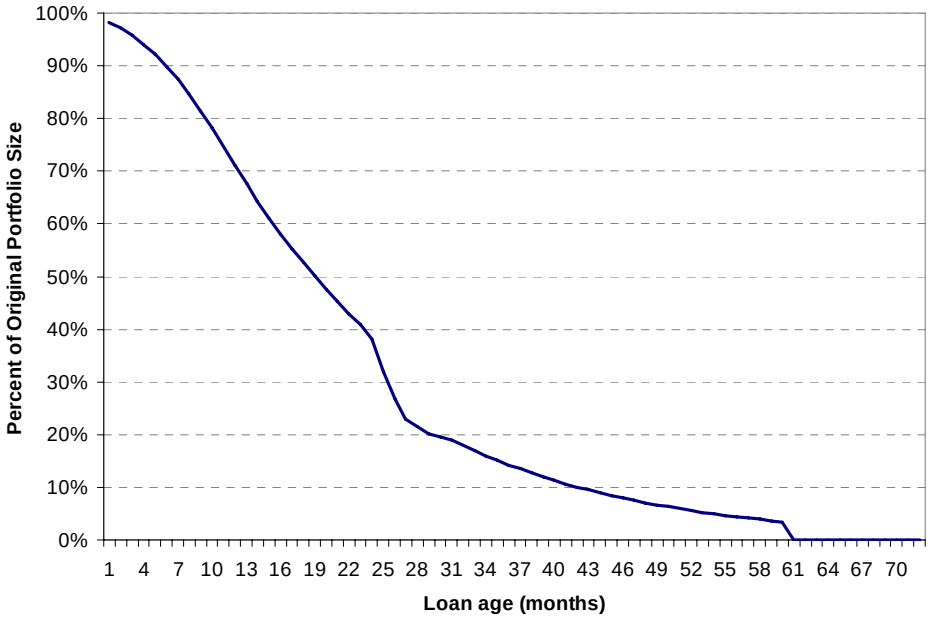
In order to measure the amount of imputed output provided by banks to borrowers of securitized loans, we start with the difference between the interest rate and the reference rate. However, the bank receives cash flows from its servicing operations, its role as an interest swap counterparty, and from interest paid on any retained positions. As is such, it is necessary to adjust the current BEA approach for these factors when implementing it to securitized loans.

Figure 2: Cumulative Loss Thresholds for GSAMP Trust 2006-NC2 Trigger Event



Source: SEC Prospectus for GSAMP Trust 2006-NC2

Figure 3: Schedule of Interest Swap Notional for GSAMP Trust 2006-NC2



Source: SEC Prospectus for GSAMP Trust 2006-NC2

4. Implementation

In preparing off-balance sheet measures of imputed output, but decided to follow the BEA approach, rather than the alternative suggested by Basu, Inklaar, and Wang (2006), for the following reasons.

First, even if one feels strongly that compensation for credit risk should be removed from imputed bank output, it is not clear to us that this can be implemented practically. For example, Basu, Inklaar, and Wang (2006) adjust the reference rate for risk by using interest rates on mortgage-backed securities for real estate loans and by using interest rates on asset-backed securities for credit card loans. Given the discussion of securitization above, it is clear that these adjustments are inappropriate for their intended purpose. In particular, banks typically hold very senior highly-rated mortgage-backed securities. The interest rate on these securities is a poor proxy for the amount of credit risk on the portfolio, as they correspond to the credit risk on securities with significant amounts of credit enhancement. One can make a similar point about using asset-backed securities spreads for measuring the credit risk of credit card loans. Of course this point implies that the actual bias of the current BEA methodology is even larger than that implied by the authors.

Second, it seems reasonable to us that the option to default is just an insurance contract bundled with a riskless loan. In this sense, the credit spread paid by the borrower is really just an insurance premium. The academic literature is correct to note that there is an inconsistent treatment between banks and non-banks, but we feel that it would make at least as much sense to find a way of measure the insurance product sold by non-banks to borrowers as it would to remove the compensation for credit risk from the current measure of imputed bank output.

Of course this raises the question of how the National Income and Product Accounts handle insurance services. Chen and Fixler (2003) document the methodology for property and casualty insurance, which corresponds to the sum of insurance premia actually paid by the consumer as well as interest income earned by the insurance company net of expected losses. The BEA uses expected instead of actual losses as the former is the likely figure used in pricing insurance services. Note that losses are netted out of gross output for this type of insurance because they typically correspond to consumption spending by the insured (i.e. auto repairs), so to leave them in would involve double-counting of output. In contrast, the BEA measures the output of life insurance companies using their administrative expenses. We will investigate these issues further in a future draft of the paper.

Our real contribution is to compute measures of services provided to borrowers but not reported on the balance sheet due to securitization. The methodology for doing this is described in detail below.

4.1 Measuring imputed output of securitized assets

The following table displays Schedule RS from the Call Reports of Income and condition. There is an identical schedule on the consolidated bank holding company report Y-9C. The Appendix explains the details of the Schedule.

Table 3: Schedule RS: Servicing, Securitization, and Asset Sale Activities

	(Column A) 1–4 Family Residential Loans	(Column B) Home Equity Lines	(Column C) Credit Card Receivables	(Column D) Auto Loans	(Column E) Other Consumer Loans	(Column F) Commercial and Industrial Loans	(Column G) All Other Loans, All Leases, and All Other Assets
1. Outstanding principal balance of assets sold and securitized by the reporting bank with servicing retained or with recourse or other seller-provided credit enhancements	RCFD B705	RCFD B706	RCFD B707	RCFD B708	RCFD B709	RCFD B710	RCFD B711
6. Amount of ownership (or seller's) interests carried as:							
a. Securities (included in Schedule RC-B or in Schedule RC, item 5)		RCFD B761	RCFD B762			RCFD B763	
b. Loans (included in Schedule RC-C)		RCFD B500	RCFD B501			RCFD B502	
2. Outstanding principal balance of assets serviced for others (includes participations serviced for others):							
a. Closed-end 1–4 family residential mortgages serviced with recourse or other servicer-provided credit enhancements							RCFD B804
b. Closed-end 1–4 family residential mortgages serviced with no recourse or other servicer-provided credit enhancements							RCFD B805
c. Other financial assets (includes home equity lines)							RCFD A591

We take the data from this report and use it to compute aggregate bank output, first by solely using on - balance sheet activity (the current procedure) , and then augment this with estimates of the output produced if securitized assets were retained on the balance sheet.

The lower portion of Tables 1 computes imputed output created by banks for securitized loans in 2006, broken out into seven categories: 1-4 family residential, home equity lines of credit, credit card balances, auto loans, other consumer loans, commercial & industrial loans, and all other loans (e.g. leases). In order to account for retained positions, the tables report net off-balance positions when appropriate, removing loans or securities kept on the bank balance sheet.

We use interest rates from the bank's on-balance sheet loan portfolio as a proxy for interest rates on securitized loans: real estate loans for securitized 1-4 family residential and home equity lines of credit, credit card loans for themselves, other consumer loans for auto loans and other consumer loans, commercial & industrial loans for themselves, and total loans for all other loans.

The reference rate is used with these interest rates in order to compute spreads, and then multiplied by the amount securitized in order to measure gross and net imputed output. Lines 39 and 40 report total gross and net imputed output across all loan categories. Note that the net figure for imputed securitization output is $43 billion.

The final step is to remove servicing fees from this measure. Line 41 reports the total portfolio serviced by the bank from Schedule RS and the servicing fee income from Schedule RI. We take the ratio of these two figures in order to compute a servicing fee rate of 29 basis points. This fee rate (29 bps) is applied to the current gross balance of securitized loans ($1.3 trillion) in order to measure imputed output from servicing that is double-counted in the measure of imputed securitization output ($3.78 billion). This figure is removed from the measure of imputed output in line 40 to arrive at a final figure of $39.97 billion, which is about 13.5 percent of on-balance-sheet imputed output. Note that there is more imputed output from credit cards than from mortgage loans, presumably due to the higher interest spreads on the former than the latter.

While we have done our best to avoid double-counting, some important issues remain, although we feel the magnitude of these effects are quite small. First, some fraction of the payments by the trust to the interest swap counterparty is included in a bank's trading revenue. As we cannot subtract these payments from our measure of imputed output, there is potential for double-counting. For an institution running a matched book of interest rate swaps, trading revenue would correspond to the bid-ask spread on those swaps, and thus have a magnitude of a few basis points. Second, the credit rating agencies are paid by the arranger at

issue, and these fees are in the range of 2-3 basis points. Finally, credit card transactions often include an insurance wrap for the senior tranche, which is a cost in the range of a few basis points. Together, these effects are likely smaller than 10 basis points, and not an important source of bias in our methodology.

Table 4 replicates this analysis for 2001, when securitization accounted for 10.6 percent of imputed bank output. Note that there has been a growth of 43.2 percent over 2001 to 2006, an annual growth rate of 7.4 percent.

Finally, Table 5 replicates this analysis for bank holding companies (bhcs) in 2006. One source of concern is that many bank holding companies originate and distribute loans out of non-bank subsidiaries, so that their securitization activities might not be fully captured when focusing only on the activities of banks. While imputed on-balance sheet output is about equal to that of commercial banks ($290 billion for bhcs vs. $294 billion for banks), the table documents that the imputed securitized output is even larger at bank holding companies due to securitization by non-banks ($49.81 billion for bhcs vs $39.97 billion for banks), amounting to 17 percent of imputed on-balance sheet output.

5. Conclusion

Commercial banks have increasingly moved into the role of originator of loans that are then sold into structured security vehicles. As our example illustrates, these vehicles are designed to subdivide payments from borrowers into tranches designed to bear differing degrees of risk and return. On an ongoing basis, the operation of these entities contributes little to national output or to the output of the financial sector, since they are viewed primarily as mere conduits directing funds from borrowers to lenders. This shift has had the effect of retarding the growth of financial sector output (since traditional deposit-based lending is assumed to generate substantial amounts of implicit services to both borrowers and depositors). Our calculation is that treating off-balance sheet lending originated by banks in the same manner as on-balance sheet loans would boost bank output by more than 10%. This dollar amount of our estimate would be reduced if we adopted the methodology proposed by Wang-Basu-Fernald (2003), which would have the effect of lowering the overall level of bank output, but the argument would be much the same.

In the current environment the asymmetry between bank loans and other financial instruments could have some practical import. The subprime crisis has resulted in a substantive enlargement of bank balance sheets, as the sponsors of many structured vehicles have turned back to bank financing. In the current methodology, other things equal, this shift will have the effect of boosting financial sector output, and to the extent bank asset growth is financed by household deposits, overall GDP. This can see as anomalous, given that one would ordinarily regard such events as have contractionary implications for both the financial sector and for the economy as a whole.

A further issue involves the measurement of aggregate output and inflation. In the current methodology, depository institutions are viewed as providing imputed services to depositors (as are any other financial intermediary seen as paying below-market rates to households maintain accounts), which is a component of consumer outlays on services and thus of GDP. Other things equal, the securitization of a loan implies that a bank will shed the matching liability, resulting in a reduction of consumption and GDP. As our discussion of the structured product suggests, there are arguably services being provided to the holders of the securities over and above those provided to the owners of conventional instruments such as government debt or corporate bonds, most notably the credit enhancements provided to the senior tranches. The spreads between these yields and those on non-enhanced instruments could be indicative of the services provided to the security purchaser. If the National Accounts were to credit owners with these services, consumer spending and GDP would be boosted. However, as is the case with the current measures of imputed bank services, the amount of this nominal imputed output is quite volatile, being sensitive to movements in interest rates. The real services provided would likely be viewed as quite stable, thus the volatility in nominal output is reflected in the inflation measure. It has been observed that shifts in the current measure of imputed output accruing to depositors adds volatility to the overall personal consumption expenditure price index; the inclusion of another interest-rate sensitive component of imputed output would likely further magnify this source of volatility in the inflation numbers.

Table 4: Imputed bank output, 2001

Category	Balance	Interest	Rate	Spread	Output
1. Real estate loans	$ 1,936.81	$ 142.74	7.37%	1.50%	$ 29.04
2. Commercial & industrial loans	$ 838.63	$ 69.91	8.34%	2.47%	$ 20.68
3. Credit card loans	$ 215.62	$ 28.74	13.33%	7.46%	$ 16.09
4. Other consumption loans	$ 372.88	$ 32.15	8.62%	2.75%	$ 10.26
5. Loans to foreign governments	$ 2.39	$ 0.15	6.34%	0.47%	$ 0.01
6. All other loans, domestic offices	$ 269.27	$ 15.46	5.74%	-0.13%	$ (0.35)
7. Loans in foreign offices	$ 297.06	$ 23.66	7.97%	2.10%	$ 6.23
9. Leases	$ 162.59	$ 11.04	6.79%	0.92%	$ 1.49
10 Total loans	$ 3,932.67	$ 314.12	7.99%	2.12%	$ 83.25
11. Interest-bearing balances	$ 126.23	$ 5.42	4.29%	-1.58%	$ (1.99)
12. US Treasury & Agency securities	$ 256.29	$ 15.05	5.87%	0.00%	$ -
13. Mortgage-backed securities	$ 663.41	$ 34.66	5.22%	-0.65%	$ (4.28)
14. Other securities	$ 245.56	$ 18.07	7.36%	1.49%	$ 3.65
15. Trading assets	$ 302.94	$ 9.56	3.16%	-2.71%	$ (8.22)
16. Federal funds and repos	$ 323.73	$ 12.75	3.94%	-1.93%	$ (6.26)
17. Other assets	$ -	$ 2.37			
18. Total interest-bearing assets	$ 5,850.83	$ 423.03	7.23%	1.36%	$ 79.56
19. Transaction deposits	$ 771.56	$ 3.21	0.42%	5.45%	$ 42.08
20. Saving deposits and MMDAs	$ 1,804.41	$ 34.47	1.91%	3.96%	$ 71.45
21. Large time deposits	$ 580.08	$ 28.87	4.98%	0.89%	$ 5.19
22. Small time deposits	$ 824.25	$ 46.35	5.62%	0.25%	$ 2.03
23. Foreign deposits	$ 629.51	$ 25.40	4.03%	1.84%	$ 11.56
24. Federal funds and repos	$ 520.70	$ 20.60	3.96%	1.91%	$ 9.97
25. Trading liabilities and other borrowings	$ 792.38	$ 33.94	4.28%	1.59%	$ 12.58
26. Subordinated debt	$ 95.72	$ 5.41	5.66%	0.21%	$ 0.20
27. Total interest-bearing liabilities	$ 6,018.61	$ 198.26	3.29%	2.58%	$ 155.06
28. Total on-balance-sheet imputed output					$ 234.62
29. 1-4 family residential net	$ 723.94			1.50%	$ 10.85
30. Home equity gross	$ 23.48			1.50%	$ 0.35
31. Home equity net	$ 14.24			1.50%	$ 0.21
32. Credit cards gross	$ 339.34			7.46%	$ 25.32
33. Credit cards net	$ 273.61			7.46%	$ 20.41
34. Auto loans gross	$ 10.49			2.75%	$ 0.29
35. Other consumer loans net	$ 19.26			2.75%	$ 0.53
36. Commercial & industrial loans gross	$ 24.76			2.47%	$ 0.61
37. Commercial & industrial loans net	$ 20.88			2.47%	$ 0.51
38. Other loans net	$ 22.45			2.12%	$ 0.48
39. All loans gross	$ 1,163.72				$ 38.43
40. All loans net	$ 1,084.88				$ 33.29
41. All serviced loans	$ 2,554.82	$ 11.81	0.46%		$ 5.38
44. Securitization output					$ 27.91
45. Total imputed bank output					$ 262.53

Table 5: Imputed bank holding company output, 2006

Category	Balance	Interest	Rate	Spread	Output
9. Leases	$ 155.72	$ 7.94	5.10%	0.54%	$ 0.84
10 Total loans	$ 6,007.18	$ 385.31	6.41%	1.86%	$ 111.62
11. Interest-bearing balances	$ 179.96	$ 9.95	5.53%	0.97%	$ 1.75
12. US Treasury & Agency securities	$ 282.68	$ 12.88	4.56%	0.00%	$ -
13. Mortgage-backed securities	$ 1,033.83	$ 52.58	5.09%	0.53%	$ 5.48
14. Other securities	$ 468.70	$ 29.83	6.36%	1.81%	$ 8.47
15. Trading assets	$ 1,303.54	$ 49.52	3.80%	-0.76%	$ (9.87)
16. Federal funds and repos	$ 1,210.69	$ 73.62	6.08%	1.53%	$ 18.46
17. Other assets	$ -	$ 5.35			
18. Total interest-bearing assets	$ 10,486.58	$ 663.59	6.33%	1.77%	$ 185.80
20. Other domestic deposits	$ 3,277.37	$ 51.51	1.57%	2.98%	$ 97.82
21. Large time deposits	$ 941.86	$ 37.09	3.94%	0.62%	$ 5.82
22. Small time deposits	$ 754.97	$ 28.44	3.77%	0.79%	$ 5.96
23. Foreign deposits	$ 1,081.90	$ 35.68	3.30%	1.26%	$ 13.61
24. Federal funds and repos	$ 1,625.37	$ 98.60	6.07%	-1.51%	$ (24.54)
25. Trading liabilities and other borrowings	$ 2,364.41	$ 93.77	3.97%	0.59%	$ 13.96
26. Subordinated debt	$ 313.68	$ 22.48	7.17%	-2.61%	$ (8.19)
27. Total interest-bearing liabilities	$ 10,359.57	$ 367.56	3.55%	1.01%	$ 104.43
28. Total on-balance-sheet imputed output					$ 290.24
29. 1-4 family residential net	$ 1,384.29			2.12%	$ 29.32
30. Home equity gross	$ 55.61			2.12%	$ 1.18
31. Home equity net	$ 53.25			2.12%	$ 1.13
32. Credit cards gross	$ 313.35			7.84%	$ 24.57
33. Credit cards net	$ 257.03			7.84%	$ 20.15
34. Auto loans gross	$ 18.44			2.97%	$ 0.55
35. Other consumer loans net	$ 32.96			2.97%	$ 0.98
36. Commercial & industrial loans gross	$ 29.56			3.16%	$ 0.93
37. Commercial & industrial loans net	$ 27.16			3.16%	$ 0.86
38. Other loans net	$ 166.88			2.65%	$ 4.42
39. All loans gross	$ 2,001.08				$ 61.88
40. All loans net	$ 1,940.01				$ 57.41
41. All serviced loans	$ 5,987.30	$ 23.48	0.39%		$ 7.61
44. Securitization output					$ 49.81
45. Total imputed bank output					$ 340.04

6. Data Appendix

Current principal balance of securitized assets

Outstanding principal balance of assets sold and securitized by the reporting bank with servicing retained or with recourse or other seller-provided credit enhancements. Report in the appropriate column the principal balance outstanding as of the report date of loans and leases which the reporting bank has sold and securitized while:
(1) Retaining the right to service these assets or
(2) When servicing has not been retained, retaining recourse or providing other seller-provided credit enhancements to the securitization structure.

Recourse or other seller-provided credit enhancement means an arrangement in which the reporting bank retains, in form or in substance, any risk of credit loss directly or indirectly associated with a transferred (sold) asset that exceeds its pro rata claim on the asset. It also includes a representation or warranty extended by the reporting bank when it transfers an asset, or assumed by the bank when it services a transferred asset, which obligates the bank to absorb credit losses on the transferred asset. Such an arrangement typically exists when a bank transfers assets and agrees to protect purchasers or some other party, e.g., investors in securitized assets, from losses due to default by or nonperformance of the obligor on the transferred assets or some other party. The bank provides this protection by retaining:
(a) an interest in the transferred assets, e.g., credit-enhancing interest-only strips, "spread" accounts, subordinated interests or securities, collateral invested amounts, and cash collateral accounts, that absorbs losses, or
(b) an obligation to repurchase the transferred assets in the event of a default of principal or interest on the transferred assets or any other deficiency in the performance of the underlying obligor or some other party. Subordinated interests and subordinated securities retained by a bank when it securitizes assets expose the bank to more than its pro rata share of loss and thus are considered a form of credit enhancement to the securitization structure.

- Include in column C the amount outstanding of any credit card fees and finance charges that the reporting bank has securitized and sold in connection with its securitization and sale of credit card receivable balances.

- Exclude the principal balance of loans underlying seller's interests owned by the reporting bank; report the amount of seller's interests in Schedule RC-S, item 6.

- Also exclude small business obligations transferred with recourse under Section 208 of the Riegle Community Development and Regulatory Improvement Act of 1994, which are to be reported in
- Schedule RC-S, Memorandum item 1, below.

- Do not report in this item the outstanding balance of 1-4 family residential mortgages sold to the Federal National Mortgage Association (Fannie Mae) or the Federal Home Loan Mortgage Corporation (Freddie Mac) that the government-sponsored agency in turn securitizes. Report 1-4 family residential mortgages sold to Fannie Mae or Freddie Mac with recourse or other seller-provided credit enhancements in Schedule RC-S, item 11, column A, and report the maximum credit exposure arising from the enhancements in item 12, column A.

- If servicing has been retained on the 1-4 family residential mortgages, report the outstanding principal balance of the mortgages in Schedule RC-S, Memorandum item 2.a or 2.b depending on whether the servicing is performed with or without recourse or other servicer-provided credit

enhancements. If the bank has both retained the servicing and provided credit enhancements, report the principal balance of the 1-4 family residential mortgages in Schedule RC-S, item 11, column A, and in Memorandum item 2.a.

- Exclude securitizations that the reporting bank has accounted for as secured borrowings because the transactions do not meet the criteria for sale accounting under generally accepted accounting principles. The securitized loans and leases should continue to be carried as assets on the reporting bank's balance sheet.

Since almost all loans are sold with warranties and representations, this seems like the right number to use for loans originated by the bank but securitized. However, it is important to net out any positions that the bank has retained in such securitizations, bringing us to the next data item.

Retained exposure

Amount of ownership (or seller's) interests carried as. Report in the appropriate sub-item the carrying value of the reporting bank's ownership (or seller's) interests associated with the securitization structures reported in Schedule RC-S, item 1, above.

Securities. Report in the appropriate column the carrying value of seller's interests in the form of a security that are included as available-for-sale or held-to-maturity securities in Schedule RC-B – Securities – or as trading securities in Schedule RC, item 5, "Trading assets." A seller's interest is in the form of a security only if the seller's interest meets the definition of a security in FASB Statement No. 115, "Accounting for Certain Investments in Debt and Equity Securities."

Loans. Report in the appropriate column the carrying value of seller's interests not in the form of a security. Such seller's interests are to be reported as loans and included in Schedule RC-C – Loans and Lease Financing Receivables.

In order to avoid double-counting, it is necessary to subtract these retained exposures from the first line item in order to measure the current principal balance of securitized loans that is actually off the balance sheet.

Another important issue is that the servicer is compensated using interest income collected by the securitization trust. As servicing income is reported in the bank's non-interest income, it is necessary to remove this income from the imputed services created by the securitized loan portfolio. We start with the bank's servicing assets, which includes assets that it securitizes and services as well as assets that others securitized but service for others. Since servicing income it not broken out between these two categories, we will compute a servicing fee rate using this larger number as a base, and then apply it to the smaller portfolio of securitized assets.

Servicing assets

Outstanding principal balance of assets serviced for others. Report in the appropriate sub-item the outstanding principal balance of loans and other financial assets the bank services for others, regardless of whether the servicing involves whole loans and other financial assets or only portions thereof, as is typically the case with loan participations. Include (1) the principal balance of loans and other financial assets owned by others for which the reporting bank has purchased the servicing (i.e., purchased servicing) and (2) the principal balance of loans and other financial assets that the reporting bank has either originated or purchased and subsequently sold, whether or not securitized, but for which it has retained the servicing duties and responsibilities (i.e., retained servicing). If the bank services a portion of a loan or other financial asset for one or more other parties and owns the remaining portion of the loan or other financial asset, report only the principal balance of the portion of the asset serviced for others.

2.a Closed-end 1–4 family residential mortgages serviced with recourse or other servicer-provided credit enhancements. Report the outstanding principal balance of closed-end 1-to-4 family residential mortgage

loans (as defined for Schedule RC-C, part I, item 1.c.(2)) that the reporting bank services for others under servicing arrangements in which the reporting bank also provides recourse or other servicer-provided credit enhancements. Include closed-end 1-to-4 family residential mortgages serviced under regular option contracts (i.e., with recourse) with the Federal National Mortgage Association, serviced with recourse for the Federal Home Loan Mortgage Corporation, and serviced with recourse under other servicing contracts.

2.b Closed-end 1–4 family residential mortgages serviced with no recourse or other servicer-provided credit enhancements. Report the outstanding principal balance of closed-end 1-to-4 family residential mortgage loans (as defined for Schedule RC-C, part I, item 1.c.(2)) that the reporting bank services for others under servicing arrangements in which the reporting bank does not provide recourse or other servicer-provided credit enhancements.

2.c Other financial assets. NOTE: Memorandum item 2.c is to be completed if the principal balance of loans and other financial assets serviced for others is more than $10 million. Report the outstanding principal balance of loans and other financial assets, other than closed-end 1-to-4 family residential mortgage loans, that the reporting bank services for others. These serviced financial assets may include, but are not limited to, home equity lines, credit cards, automobile loans, and loans guaranteed by the Small Business Administration.

Servicing fees are reported on Schedule RI, in the section documenting the non-interest income of the bank or bank holding company.

Net servicing fees

Report income from servicing real estate mortgages, credit cards, and other financial assets held by others. Report any premiums received in lieu of regular servicing fees on such loans only as earned over the life of the loans. For servicing assets and liabilities measured under the amortization method, banks should report servicing income net of the related servicing assets' amortization expense, include impairments recognized on servicing assets, and also include increases in servicing liabilities recognized when subsequent events have increased the fair value of the liability above its carrying amount. For servicing assets and liabilities re-measured at fair value under the fair value option, include changes in the fair value of these servicing assets and liabilities. For further information on servicing, see the Glossary entry for "servicing assets and liabilities."

For completeness, we keep track of net securitization income, which corresponds to other fees earned by the bank on securitization transactions. Note that this income is correctly counted as bank output by the Bureau of Economic Analysis in the National Income and Product Accounts as it is a component of non-interest income.

Net securitization income.

Report net gains (losses) on assets sold in the bank's own securitization transactions, i.e., net of transaction costs.

Include unrealized losses (and recoveries of unrealized losses) on loans and leases held for sale in the bank's own securitization transactions.

Report fee income from securitizations, securitization conduits, and structured finance vehicles, including fees for providing administrative support, liquidity support, interest rate risk management, credit enhancement support, and any additional support functions as an administrative agent, liquidity agent, hedging agent, or credit enhancement agent.

Include all other fees (other than servicing fees and commercial paper placement fees) earned from the bank's securitization and structured finance transactions.

Exclude income from servicing securitized assets (report in Schedule RI, item 5.f, above), fee income from the placement of commercial paper (report in Schedule RI, item 5.d.(2), above), and income from seller's interests and residual interests retained by the bank (report in the appropriate subitem of Schedule RI, item 1, "Interest income").

Also exclude net gains (losses) on loans sold to -- and unrealized losses (and recoveries of unrealized losses) on loans and leases held for sale to -- a government-sponsored agency or another institution that in turn securitizes the loans (report in Schedule RI, item 5.i, "Net gains (losses) on sales of loans and leases").

7. References

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