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Sent:	Wednesday, July 22, 2020 12:01 PM
To:	regs.comments@occ.treas.gov; regs.comments@federalreserve.gov; Comments
Cc:	Mark Heil
Subject:	[EXTERNAL MESSAGE] Loans to Small Businesses and Small Farms
Attachments:	Heil_Missing the cut_FinanceResearchLetters_2019.pdf

Greetings,

I recently came across the Federal Register request for comment on Reporting of Data on Loans to Small Businesses and Small Farms, dated 10/17/2019, pp. 55687-55690. I realize the comment period closed many months ago and this submission will not be included in the official record.

Nonetheless, I'd like to submit the attached brief journal article I authored because it speaks directly to Question 3c in the FR notice and might add substantive value to the policy discussion. This paper was not referenced in the GAO study cited in the FR request for comment, so it might represent information not previously considered.

Incidentally, I'm an economist at a federal agency but I am submitting this in my private capacity. Please don't hesitate to contact me if you have questions or suggestions. If there is a different email address I should send to, please let me know.

Thank you for your consideration.
Mark Heil

ELSEVIER

Missing the cut? How threshold effects distort U.S. small business lending trends☆

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A B S T R A C T

This paper estimates a downward bias over time in official U.S. lending data series widely used to proxy credit flows to small businesses. The bias occurs because the upper loan origination size threshold used to proxy this lending is fixed and denominated in nominal currency, so its real value erodes over time due to inflation. Some advocates invoke the apparent declining small business lending trend to push governments to implement support programs for these businesses. The paper offers preliminary fully inflation-adjusted multipliers applicable to nominal lending data so that analysts may observe more accurate trends and better inform policy decisions.

1. Introduction

Data on lending to small businesses from banks provide a key input to policy discussions on credit conditions. Access to capital by small businesses has been a frequent area of policy action in the post-recession period. Federal assistance programs, such as those launched by the Small Business Jobs Act of 2010 have targeted this group, prompted by concerns that insufficient credit flow may impair economic recovery.

Apparent long-term trends in bank lending to small businesses compared with lending to larger businesses raise particular concerns about the persistent and growing gap between the two, as illustrated by the sharp decline in the outstanding share of small business lending since 1995 (see Fig. 1, adapted from a working paper). It shows in nominal terms, the small business share of commercial loan balances dropped from over half in 1995 to under one-third by 2012, highlighting the apparent disparity in credit access by business size and fueling the case for policy intervention.[1]

However, the unaccounted effects of inflation may render this comparison misleading over time, and the associated inaccurate lending trends can generate support for public programs designed to address a condition that may be systematically misstated. This note proposes generating a more consistent lending baseline that would provide an improved basis for policy analysis.

The Federal Deposit Insurance Corporation (FDIC) publishes "Quarterly Banking Profiles" for all FDIC-insured institutions (FDIC 2015). They are a primary source of data on bank credit provision to small businesses, but they lack a direct means of identifying the size of borrower businesses. Instead, they designate loans to small businesses by the origination amounts of loans (generally $1 million and below), which is a unique feature of small business lending data.[2]

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[1] Real economic conditions like weak credit demand and reduced collateral values may also influence outcomes. See Wiersch and Shane (2013) for a summary.

[2] "Commercial and industrial" loans and "Non-farm, non-residential" loans of origination size of less than or equal to $1 million are considered loans to small businesses.

Source: Reproduced from Mills and McCarthy (2014) based on FDIC Call Reports to 2012.
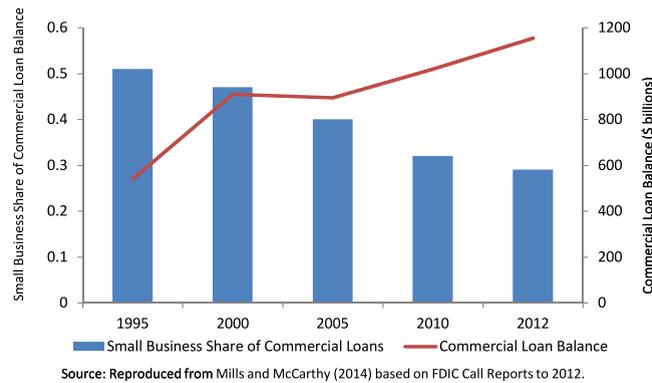
Fig. 1. Small business loans as a share of total loans are in secular decline: small business share of loans at banks vs. total outstanding commercial loans.

Defining small business lending by loan origination size simplifies the task of estimating lending to small businesses, but compromises the accuracy of the data. First, false positives (loans of $1 million and less that go to larger businesses) and false negatives (loans exceeding $1 million that go to small businesses) may distort the picture, although to some extent they may counteract each other. Second, the loan size thresholds themselves are uniformly designated in nominal U.S. dollars (USD), and therefore do not account for inflation. This note focuses on the second concern and assesses the direction and magnitude of the potential effects of price inflation on the accuracy of small business lending data from 1995 through 2014.

2. Analytic approach

The compounding effects of inflation amplify the gap between nominal and real figures as the period of analysis lengthens. To fully account for price inflation, we consider two separate effects. The *purchasing power effect* of inflation is simply the impact of general price inflation on the real value of small business lending. This effect erodes the value of currency over time, so that a $1 million (nominal USD) loan in 1995 could purchase substantially more than could a $1 million (nominal USD) loan in 2014. The *threshold effect* of inflation refers to the fact that the upper limit of a loan's origination amount used to define small business lending ($1 million in nominal USD) changes in real value each year, due to inflation.[3] It effectively reduces the real value of the upper threshold of loans qualifying as small business loans in each passing year (assuming positive annual inflation rates).

Fig. 2 illustrates the cumulative impact of the purchasing power effect of inflation over time. Based on the GDP deflator index (FRB 2015), general prices increased by 44% between 1995 and 2014. All else equal, this effect substantially inflates the apparent value of small business lending over time when reporting in nominal figures.

Our framework sums annual national aggregate lending up to $1 million in origination value in four distinct ways to simulate the effects of both types of inflation on small business lending. The four aggregation methods cover the range of nominal USD and real USD combinations as applied to the two dimensions of interest: the value of annual lending totals (purchasing power effect of inflation) and to the designation of the $1 million loan size upper limit (threshold effect). Below, the first word of each underscored method title refers to whether the lending totals are expressed in nominal or real USD. The second word refers to whether the loan size threshold defining small business lending is denominated in nominal or real USD.

- **Nominal–Nominal (Nom–Nom):** Small business lending in nominal USD, with the loan size threshold ($1 million) defined in nominal USD. This metric considers neither effect of inflation, and it is the most common way of reporting small business lending.
- **Real–Nominal (Real–Nom):** Lending in constant USD, with loan size thresholds defined in nominal USD. A subset of the literature shows lending this way.
- **Nominal–Real (Nom–Real):** Lending in nominal USD, with the upper loan size limit defined in constant USD (e.g., $1 million in constant 1995 USD). This adjusts for the threshold effect of inflation, but not for the purchasing power effect. We are unaware of any literature that uses constant real loan size threshold values.
- **Real–Real (Real–Real):** Lending in constant USD, with size limits also defined in constant USD (e.g., lending in 2005 USD, using a threshold of $1 million in 2005 USD). The base years for the constant USD could be the same for both components, or could differ. This approach provides an accurate metric of lending by fully accounting for both the purchasing power and the threshold effects of inflation. We are unaware of literature that reports lending data in this format.

This review draws upon, but is by no means meant to assess, the Small Business Administration 7a loan program. We use this SBA data because it provides individual loan level data for nearly one million observations over our period of analysis, allowing us to

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[3] To simplify the analysis, we focus on the $1 million threshold alone. FDIC Quarterly Banking Profiles also report lending up to $100,000; between $100,001 and $250,000; and between $250,001 and $1 million in origination value.
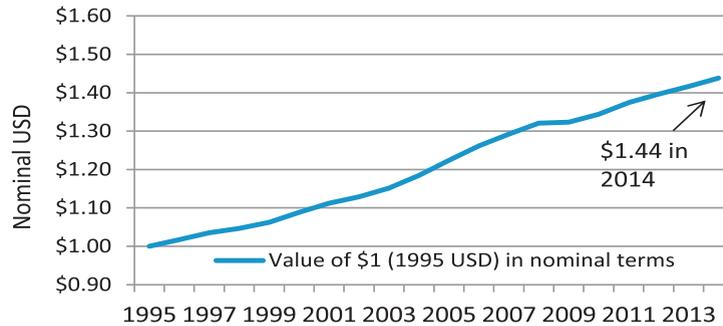
Fig. 2. Cumulative impact of purchasing power effect of inflation: real value of $1 (1995 USD) through 2014.

examine the distribution of loan origination amounts each year (SBA 2015). We assess how the threshold effects of inflation, which work through the loan size limits, influence the apparent aggregate values of small business lending over time.[4] In order to assess this threshold effect, one must also consider the purchasing power effect, and disentangle the two.

We assess the two effects of inflation by systematically comparing the same set of lending data and applying alternative approaches to adjusting for inflation, as described above. First, we rank order individual loans by origination size in each year. Next, we sum aggregate lending in each year using alternative origination size thresholds (including nominal USD and constant USD using different base years) to define small business loans. This yields annual lending totals in nominal USD, while highlighting the potential impact of the threshold effects of inflation (Nom–Real). We use the GDP deflator index to convert nominal lending totals to inflation-adjusted lending totals.

3. Results

Numerous alternative combinations of nominal and constant USD base years could be applied in assessing the purchasing power and threshold effects of inflation; we focus on a couple combinations to demonstrate the effects of inflation.

Fig. 3 shows purchasing power effects and threshold effects of inflation on lending to small businesses. The solid black line shows SBA gross loan approvals under the 7a program, when both lending volumes and the origination size thresholds are expressed in nominal USD (no inflation adjustment). The green dotted line highlights lending in nominal USD, when the real loan size threshold is held constant at $1 million in 1995 USD (Nom–Real 1995) (partial inflation adjustment). The dashed red line shows fully inflation-adjusted lending expressed in 2014 USD, where small business lending is defined as loan originations up to $1 million in 1995 USD (Real 2014-Real 1995). This accurately reflects true lending trends over time because it eliminates both the purchasing power effect and the threshold effect of inflation. We combine different constant USD base years because it holds intuitive appeal to use a recent purchasing power value (2014 USD) to describe lending volumes while also preserving the value of the original size threshold (1995 USD).

Comparing the black and red lines shows that lending reported in the typical Nom–Nom metric substantially underestimates lending over extended time scales. However, one should not infer that *every* Real–Real combination would necessarily exceed lending given in unadjusted Nom–Nom USD or partially adjusted ones. Similarly, it is invalid to conclude that non-fully inflation-adjusted lending data always understates true lending volumes. We *can* state that Real 2014–Real 1995 provides an accurate lending metric over time and is higher in value than any other metric over the sample period.

The purchasing power effect and the threshold effect of inflation have opposite directional influences, and the data show some offsetting of the two. Overall, the purchasing power effect dominates in our sample. Fig. 4 illustrates the cumulative impacts of the two effects of inflation and shows the purchasing power effect is roughly double the threshold effect by the end of the period, expressed as shares of the overall difference in lending between the Real 2014–Real 1995 and the Nom–Nom metrics. The explanation is that the purchasing power effect of inflation reflects the full level of price inflation over the period of analysis, but the threshold effect affects only a subset of loans.[5] The exact impact of the threshold effect depends on the distribution of loan origination sizes and the real value of the threshold.

4. Assessment

We return to the issue of apparent relative lending shares to small and larger businesses. Fig. 5 shows small business lending shares provided by FDIC based on loan data designated in nominal USD with nominally-defined size thresholds (Nom–Nom) (solid lines), and our adjusted shares showing real lending in 2014 USD at constant size thresholds designated in 1995 USD (Real 2014–Real

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[4] Neither the SBA 7a program nor the Quarterly Banking Profile data include non-bank small business lending, such as peer-to-peer loans. See Mach et al. (2014) and Mills and McCarthy (2014) for analyses.

[5] There is also a relative scale effect at work. While the vast majority of loans are too small to be affected by the threshold effect of inflation on the loan size limit, the limited number of loans that are affected are the largest ones within the distribution, so when they fall out of the small business loan group, the impact is disproportionately large.
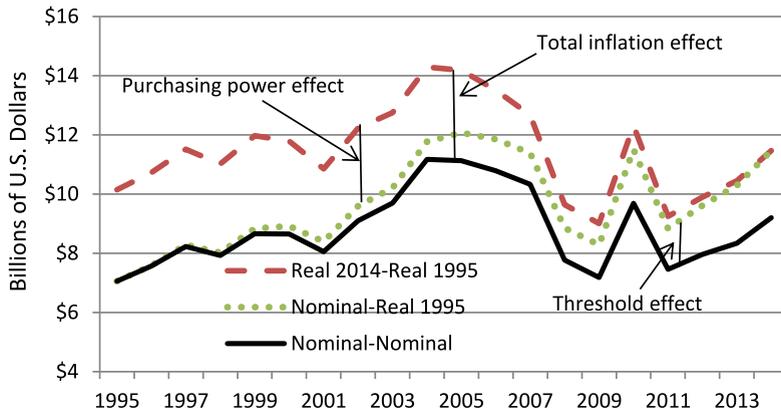
Fig. 3. Effects of inflation on the value of small business lending: alternative metrics of SBA 7a gross approvals (includes cancellations) up to $1 million in origination value.
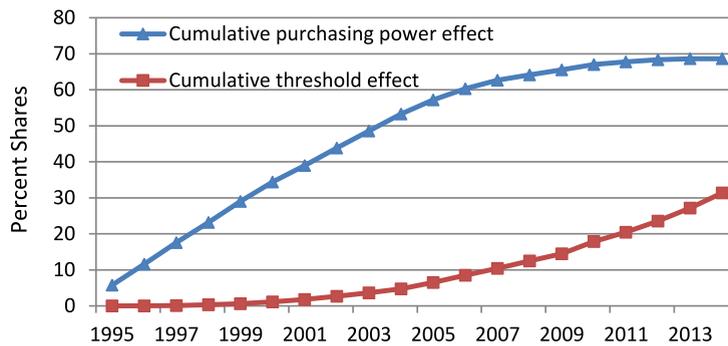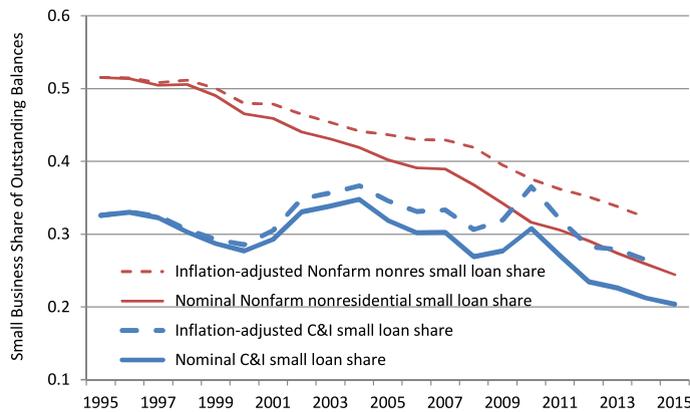

Fig. 4. Cumulative purchasing power and threshold effects of inflation: shares of cumulative difference between R2014–R1995 and Nom–Nom.

Source: Author's calculations based on FDIC Quarterly Banking Profile data

Fig. 5. Nominal and inflation-adjusted shares of small business lending: shares of outstanding balances represented by loan origination amounts up to $1 million in nominal vs. constant 1995 USD (adjusted) terms.

1995) (dashed lines). Both sets of lending shares are diminishing over time, but the adjusted shares reflect less dramatic declines, by accounting for the threshold effect of inflation. In particular, the real C&I lending share trend appears relatively flat over the full period, and may provide a less compelling case for policy intervention, all else equal.

5. Concluding thoughts

The evidence suggests the threshold effect of inflation is potentially substantial and may cloud understanding of long-term trends in small business lending. The threshold effect is dominated by the purchasing power effect. Since the two effects push in opposite

Table 1
Preliminary multipliers to convert Nom–Nom into Real–Real: 1995–2014 data.
Source: Author's calculations.

Year	Nom–Nom to Real 2014– Real 1995 USD	Nom–Nom to Real 1995– Real 1995 USD	Nom–Nom to Real 2005– Real 2005 USD	Nom–Nom to Real 2014– Real 2014 USD
1995	1.44	1.00	1.17	1.33
1996	1.42	0.99	1.08	1.18
1997	1.40	0.97	1.04	1.11
1998	1.39	0.97	1.03	1.09
1999	1.38	0.96	1.00	1.06
2000	1.36	0.95	0.97	1.05
2001	1.35	0.94	1.02	1.09
2002	1.34	0.93	1.01	1.08
2003	1.32	0.91	1.02	1.12
2004	1.28	0.89	1.00	1.12
2005	1.27	0.89	1.00	1.08
2006	1.25	0.87	0.98	1.06
2007	1.23	0.85	0.96	1.05
2008	1.24	0.86	0.95	1.02
2009	1.25	0.87	0.95	1.01
2010	1.27	0.88	0.95	0.99
2011	1.24	0.86	0.94	0.98
2012	1.24	0.86	0.94	0.99
2013	1.25	0.87	0.94	0.98
2014	1.25	0.87	0.93	1.00

Note: Multiply lending in nominal USD to yield real lending with size thresholds in constant USD.

directions, some offsetting occurs when the data are unadjusted for either effect. When adjusted for just one of the two effects (Nom–Real or Real–Nom), no offsetting occurs, and impacts on overall accuracy are ambiguous.

Improving the measurement of small business credit flows ideally would involve developing a clear definition of small businesses based on one or more relevant factors that accurately characterize them (e.g., annual revenue, number of employees), and then aggregating the credit they receive.[6] This would be superior to using the current indirect approach of defining small business lending by loan origination sizes, which generates false positives and negatives, in addition to the threshold effects of inflation.

If small business lending continues to be defined by loan origination sizes, a second-best approach would be to make it standard practice to account for both the purchasing power and threshold effects of inflation (Real–Real). Adjusting for threshold effect requires loan-level data. In practice, obtaining and analyzing loan-level data on the universe or samples of small business loans over time could be onerous, as current sources provide only aggregate lending figures.

A corollary to a second-best approach could be to use our calculations as a rough guide for converting nominal lending data into fully inflation-adjusted data, pending verification of the reliability of these figures. Table 1 shows preliminary multipliers that may be applied directly to nominally-denominated lending and size threshold data (Nom–Nom) to yield fully-adjusted (Real–Real) data. We derive the multipliers by taking the ratios of the alternative Real–Real values corresponding to the original Nom–Nom amounts each year. To the extent that the origination size distribution of SBA 7a data we use mirrors the distribution of the full array of small business lending, analysts could apply these multipliers for the 1995–2014 period, and multipliers for alternative base years could be developed. However, while the 7a program is SBA's largest, we are unsure how well the 7a loans represent the full distribution of small business loan sizes nationally.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.frl.2018.04.005.

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[6] A revenue-based definition should adjust for inflation each year to avoid creating a similar problem as the threshold effect of inflation based on nominal loan size thresholds.