The Rise of Market Power and the Macroeconomic Implications: Comment *

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Abstract

De Loecker et al. (2020) (DEU) estimate that markups increased significantly in the United States from 1955 to 2016. We find this result is sensitive to unreported sample restrictions that drop 27% of the available observations. Applying the methodology as described in the article to the full sample, markup increases are more muted until late in the sample period, and are almost entirely driven by Finance and Insurance firms. If these firms are removed, markup increases are modest. We conclude that the DEU methodology and data, as they are described in the article, do not support the conclusion that broad-based increases in market power have occurred in recent decades.

1 Introduction

De Loecker et al. (2020) (henceforth, DEU) seeks to estimate how markups—a possible proxy for market power—have evolved in the United States economy between 1955 and 2016. The article's headline result is that the average markup, as measured by

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the ratio of price to marginal cost, increased from 1.21 in 1980 to 1.61 in 2016 (DEU Figure I). DEU indicates that "...the increase in market power occurs in all sectors and industries," and that this holds under many alternative specifications. The results have been widely cited in both academic and popular settings, and are a leading piece of evidence supporting the hypothesis that market power increased in the United States over recent decades.[1]

Based on the published supplementary materials and additional necessary replication code provided by one of the DEU authors, we have identified that these results were obtained using sample restrictions that are not stated in the article or its online appendix. These restrictions excluded an additional 27% of the observations from the Compustat data used for the main results.[2] In this comment, we apply the methodology of DEU, as it is described in the article and implemented in the replication code, to the "full" Compustat data sample without the unstated restrictions, and examine whether the results of DEU still hold. We also reexamine the DEU analysis of Census data.

We provide two main results (see Figure 1). First, using the full sample, the estimated average markup follows a very different path.[3] While DEU finds that the average markup increased rapidly throughout the 1980s and 1990s, in the full sample, the average markup increases more gradually through 2008. It then sharply increases in the last few years of the sample, ending at a similar level as in the DEU sample.

Second, unlike the results in DEU, which are robust to the exclusion of individual sectors, in the full sample, the increase in markups at the end of the sample is driven almost entirely by a single sector: Finance and Insurance (F&I).[4] When the F&I sector is excluded from the full sample, the average markup increases only modestly, from just below 1.30 in the mid-1980s to about 1.35 in 2016. Furthermore, even when F&I is included in the full sample, the increase in the estimated average markup arises mainly from an artifact of the accounting data used by DEU: interest income is counted as revenue, but interest expenses typically are excluded from Cost of Goods Sold. We conclude that the results from the full Compustat sample do not appear to support DEU's conclusions that "there has been a steady rise [in markups] since 1980" and that

[1] Syverson (2019); Philippon (2019); Berry et al. (2019); U.S. Department of the Treasury (2022); Council of Economic Advisers (2022); Shapiro (2021)

[2] The sample restrictions do appear in the code included in the supplementary materials.

[3] Throughout this comment, we use the term "full sample" to refer to the Compustat data sample after applying only the sample restrictions that are stated in the article. Precise details are provided in Section 3 and Appendix B.1.

[4] Although the DEU sample results are robust to excluding F&I, this is because the unstated sample restrictions have the effect of excluding 89% (sales-weighted) of the F&I observations. The full sample results add these observations back into the sample.

"the increase in market power occurs in all sectors and industries."

We also reevaluate the two main supplementary results in the article. Most importantly, in the full sample without F&I, when markup changes are decomposed following DEU, the main finding is reversed: the average within-firm markup is decreasing over time. This finding no longer seems consistent with a story of markets becoming broadly less competitive. On the other hand, DEU's result that the upper tail of the markup distribution has fattened over time is qualitatively conserved in the full sample.

In the remainder of the comment, we explain our results and examine why they differ from DEU. We also reexamine DEU's robustness analysis of the Census data. We conclude that their Census estimates do not generally match the Compustat estimates. Finally, for completeness, we document additional discrepancies between the DEU article and the code used to generate the results. As these additional discrepancies do not meaningfully change the results, we relegate them to an appendix.

2 Methods and Data Requirements

DEU recovers markups using the "production approach." Cost minimization and other assumptions imply that the markup equals the output elasticity of the production function with respect to a freely adjustable variable input multiplied by the ratio of gross revenue to expenditure on the freely-adjustable variable input. If COGS is used as the freely-adjustable variable input, as it is in the baseline DEU specification, the markup estimate for firm i in period t is given by

$$\mu_{it} \equiv \frac{P_{it}}{MC_{it}} = \theta_{it} \times \frac{\text{Sales}_{it}}{\text{COGS}_{it}} \tag{1}$$

where P_{it} and MC_{it} are price and marginal cost, respectively, and θ_{it} is the output elasticity with respect to COGS from the production function. DEU calculates the average markup as a sales-weighted mean across firms.

The markup calculation requires knowledge of the output elasticity. For the baseline Compustat analysis, DEU estimates a production function in which the output elasticity varies across years and 2-digit sectors.[5] DEU uses variables for Sales, COGS, Capital, and Investment (which enters a control function) in estimation. Sales and COGS, along with the output elasticities, are then used to obtain markups. Markups are calculated for many firms that have valid Sales and COGS data, but are excluded from estimation

[5]We describe the production function and estimation methodology in Appendix A.

for other reasons (e.g., because Investment is missing). DEU states that, to recover markups, "a firm-year observation requires information on both sales and COGS."

3 Main Results

We begin by examining the results DEU obtains with the baseline model, which uses Compustat data. We focus on two discrepancies between the data sample described in the DEU article and that created by the replication code provided by the authors: (i) the code drops observations that have missing values for Capital, and (ii) the code drops observations that have missing values for Selling, General, and Administrative (SG&A) expenses. Neither of these two restrictions is reported in the article, but they are each substantial. If applied in order, the restriction on Capital drops 33,422 observations, and the restriction on SG&A drops a further 63,572 observations. Together, the two restrictions reduce the sample size by 27.4%. The two sample restrictions also have a large effect on the main results in DEU.

3.1 Results: The Rise of Markups

Figure 1 plots three estimates of the average markup over time. The solid red line is the estimate provided in DEU. The dashed green line is what we obtain from the full sample—i.e., without dropping missing values for Capital or SG&A. Finally, the dash-dot black line is what we obtain with the full sample excluding the Finance & Insurance sector. Using the DEU sample, the average markup increases rapidly throughout the 1980s and 1990s, pauses in the 2000s, then increases rapidly again in the final few years of the sample. In the full sample, the average markup increases more gradually through 2008. It then sharply increases in the last few years of the sample, ending at a similar level as in the DEU sample.

Moreover, unlike the DEU results, which are robust to the exclusion of individual sectors, in the full sample the increase in markups at the end of the sample is driven almost entirely by a single sector: Finance & Insurance. Excluding F&I, the average markup increases only modestly, from just below 1.30 in the mid-1980s to about 1.35 in 2016.

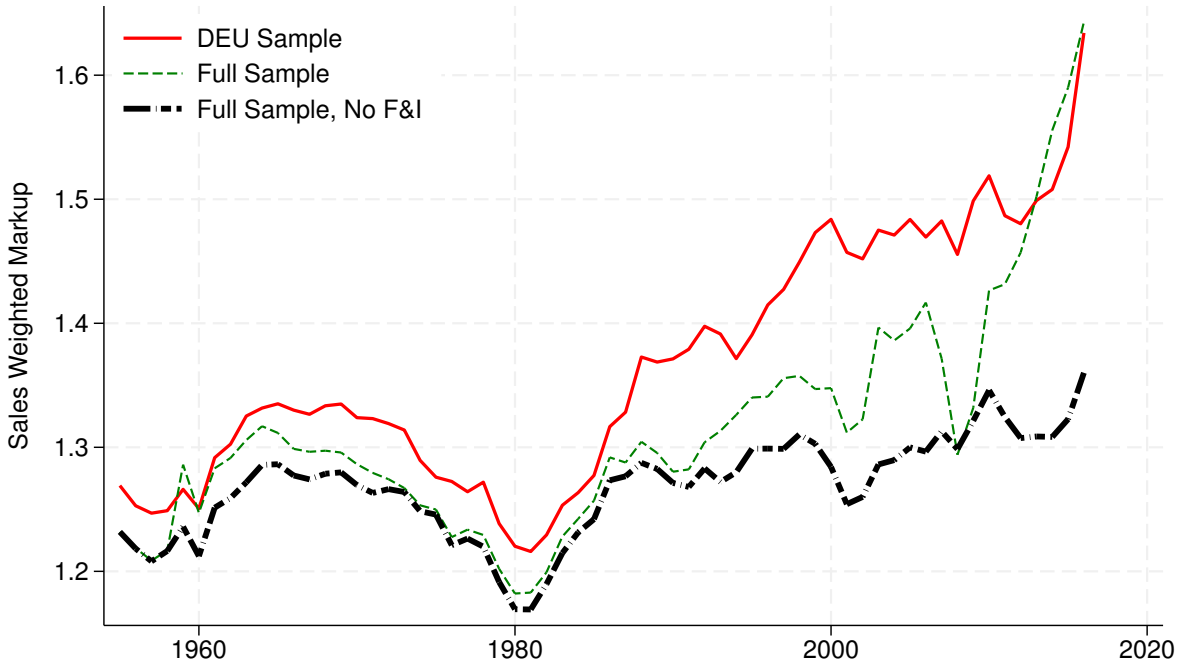

Figure 1: Markups Obtained with the DEU Sample and the Full Sample

Notes: The figure plots estimates of the sales-weighted average markup (the ratio of price to marginal cost) over time. The solid red line is a replication of Figure I of DEU, which uses a restricted sample. The dashed green line uses the full sample. The black dash - dot line uses the full sample except for the F&I sector.

3.1.1 Selection on Missing SG&A

Of the two unstated sample restrictions, it is the omission of observations with missing SG&A values that causes the results to change. Table 1 shows regressions of log(Sales) and log(COGS) on an indicator for a missing SG&A value, the same indicator interacted with a de-meaned time trend, and industry and time fixed effects (first and third columns). The second and fourth columns repeat the analysis adding firm fixed effects. The regressions show that observations with missing SG&A tend to have lower Sales, and higher COGS, and hence lower markups than other observations. These relationships are statistically significant both across firms and within firms over time. They also strengthen over the sample period. Omitting observations with missing SG&A therefore leads to a trended upward bias in the markups estimates.

Given the large impact of the sample restrictions on the markup estimates, one might reasonably wonder whether there are good reasons for excluding observations with missing SG&A values from the analysis. We have not been able to identify any. SG&A is not needed to estimate markups, and does not otherwise factor into the main results of

Table 1: Regression Analysis of Observations with Missing SG&A Values

	Dependent Variable			
	log(Sales)	log(Sales)	log(COGS)	log(COGS)
SG&A Missing	-0.142	-0.445	0.442	0.211
	(0.050)	(0.029)	(0.048)	(0.030)
SG&A Missing $\times$ Trend	-0.006	-0.007	0.009	0.004
	(0.002)	(0.001)	(0.002)	(0.001)
Firm Fixed Effects	no	yes	no	yes
R^2	0.094	0.907	0.108	0.903

Notes: This table reports the results of OLS regressions of log Sales and log COGS on an indicator for missing SG&A and its interaction with a demeaned time trend. All regressions include year and industry fixed effects. The industry fixed effects are at the 2-digit NAICS level. There are 348,176 firm-year observations. Standard errors are in parentheses.

the article, so there is no practical reason to drop these observations from the analysis. There is also no reason to believe that observations where SG&A is not reported are of low quality. SG&A are not required to be reported as a separate line item under U.S. GAAP. Companies are required to report Operating Expenses, but the precise breakdown is discretionary.[6] A close inspection of SG&A reporting in the Compustat data also does not reveal any systematic data quality issues with firm-year observations where SG&A is not reported. SG&A reporting is much higher in some sectors than others[7] but, since 1970, the fraction of public firms reporting SG&A has held steady at around 80% (see Figure C.1). Many large well-known firms have not consistently reported SG&A, including Aetna Inc, Citigroup, Delta Airlines, Ford Motor Co, HCA Healthcare, and United Parcel Service (UPS). On the other hand, if we are interested in learning what happened to average markups across the whole US economy, then it would seem important to include all of the data in this calculation.[8]

3.1.2 Finance & Insurance Accounting

Figure 1 shows that, for the full sample, the inclusion of finance firms has a large impact on the average markup, particularly after 2010. This result stands in contrast to

[6]The same is also true under International Financial Reporting Standards (IFRS).

[7]Weighted by Sales, Utilities(94%), Transportation and Warehousing (54%,/79%) and Finance and Insurance (50%) have the most missing values for SG&A – see Table C.1

[8]In response to a version of this comment, the authors of DEU have written that using the full sample "injects outliers" from NAICS four digit code 3254 (Pharmaceutical Manufacturing) into the analysis which "yield extreme results." However, in Figure C.5, we show that dropping sector 3254 from the analysis does not substantively change the main findings of this comment.

DEU's Appendix 10, which shows that in their sample, excluding the F&I sector does not change the results[9], and Appendix 15, which shows the results by sector.

There are two reasons for the differences in the full sample. One is that 89% (sales-weighted) of F&I sector observations in Compustat are missing either Capital or SG&A. Thus, after imposing these two sample restrictions, the F&I sector is *already* largely excluded from DEU's main analysis. This fact helps explain why the DEU results are robust to excluding F&I. It also provides further insight into the differences between the three lines in Figure 1. The dash-dot black line, which shows markups in the full sample excluding all F&I observations, is perhaps better compared to the red DEU sample line, which also excludes 89% of F&I observations. The difference between these two lines shows, approximately, the effect of removing the sample restrictions on the markup estimates for the rest of the economy minus F&I. The dashed green line then shows the effect of adding the F&I observations back into the sample.

In addition, there are accounting issues in the way that Compustat compiles annual reports data that have a large impact on the estimated markups for F&I firms in particular when using DEU's approach. Compustat includes interest income in Sales, but typically does not include interest expense in COGS. Using DEU's approach, this practice produces markup estimates for financial firms that are high and volatile. For example, the estimated markup of the Federal National Mortgage Association (Fannie Mae) rises from 267% in 2011 to 2130% in 2016. In combination with this effect, an increase in overall financial activity can mechanically generate rising markup estimates. The Finance & Insurance sector accounted for only 1% of the sales in Compustat in 1955, but more than 15% in 2016. In the appendix, we reproduce the main results but including interest expense in COGS for F&I firms, and show that, with this change, the increase in the economy-wide average markup is significantly more modest even when the F&I sector is included (see Figure C.2).

3.2 Other Headline Results

In addition to documenting the rise in average markups, DEU contains two other headline findings: it decomposes the changes in the average markup into changes in markups for existing firms and reallocation of economic activity across firms, and it documents long-term changes in the distribution of markups.

[9]DEU's Appendix 10 also excludes the Real Estate sector, but in the full sample, excluding Real Estate has very little impact on any results.

3.2.1 The Reallocation of Economic Activity

DEU decomposes changes in the average markup since 1980 into three forces: within-firm changes in markups, net entry, and reallocation of sales between firms. DEU finds that within-firm markups contribute about one-third of the total increase in average markups, while reallocation between firms contributes the remaining two-thirds of the change. DEU states that the within-firm result is "an indication of the change in pricing power of firms."

Figure 2 replicates DEU's Figure IV using the full sample excluding the F&I sector. In contrast to the DEU findings, in the full sample, within-firm markups are decreasing over time. Under the logic stated in DEU, we obtain the opposite conclusion: the result would indicate a *decrease* in the pricing power of existing firms over time. As in DEU, in the full sample, there is also a reallocation of sales to higher markup firms that more than offsets the decrease in within-firm markups. Taken together, these two findings seem less supportive of the conclusion that the overall increase in markups was driven by a decline in competition, perhaps due to declining antitrust enforcement. They are more supportive of a shift toward either new technologies that are more capital intensive, or new markets that are less competitive.

3.2.2 The Distribution of Markups

DEU finds that the median markup has not changed over time. The rise in the estimated average markup is instead driven by an increase in the upper tail of the markup distribution. These results are somewhat conserved in the full sample, at least in spirit. Figure C.3 replicates Figure III(B) from DEU using the full sample and excluding the F&I sector. In the full sample, it remains true that the upper tail of the markup distribution has become fatter, though the magnitude of the increase in the upper decile is approximately halved. The median markup decreases slightly over time in the full sample.

4 Census Analysis

In addition to the Compustat analysis, DEU provides an analysis based on establishment-level Census data for the manufacturing, retail, and wholesale sectors. DEU motivates the analysis "[a]s a robustness exercise," noting that it can "verify the extent of selection

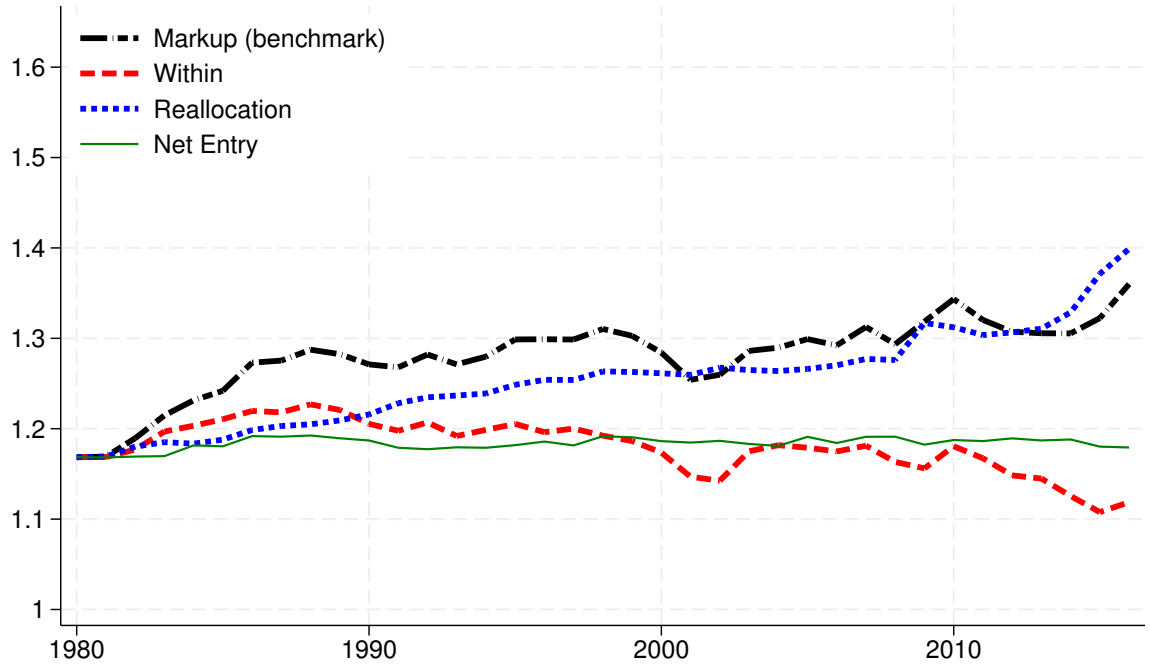

Figure 2: Decomposition of Estimated Markup Growth

Notes: The figure recreates Figure IV of DEU using the full sample excluding the F&I sector. The black dot-dash line shows the sales-weighted average markup from our main results. The red dashed line represents the contribution of within-firm markup changes, the green solid line represents the contribution of entry and exit, and the blue dotted line represents the contribution of reallocation.

bias" in the Compustat data.[10] Together, these sectors account for about 25% of GDP, on average, over 1997-2016.[11] We do not have access to either the Census data or any replication code for the Census analysis. Thus, in order to replicate this analysis, we extract the DEU Census results from Figure VI of DEU and compare them to both DEU's baseline Compustat results and also the full sample Compustat results.[12]

DEU takes a different approach for the output elasticities used in the Census analysis. For all three sectors, DEU uses a cost-shares based approach that requires stronger assumptions. For retail and wholesale, DEU also rescales the markup estimates obtained from the Census by the time-varying output elasticity estimates obtained from Compustat (see DEU Appendix 13). This process contaminates the Census results for these two

[10]Compustat includes only publicly-traded firms and includes their international sales, whereas the economic census covers all employer establishments, including private firms and excluding international sales.

[11]Our calculation is based on publicly available data from the Bureau of Economic Analysis.

[12]DEU reports Compustat results for the manufacturing, retail, and wholesale sectors in Figure 12.1 of the Online Appendix. The manufacturing sector comprises NAICS codes 31, 32, and 33. DEU reports markups for these codes separately; we combine them in our analysis.

sectors with the same missing data issue as before.[13]

Figure 3 summarizes the results for the manufacturing sector only. Because the levels of the Census markup estimates are much higher than those from Compustat, in the figure we rescale all three markup series to equal one in 1980, which allows us to instead compare how the markup estimates change over time. The solid red line shows changes in the average markup from the DEU Compustat sample, and the dash-dot black line shows changes in the average markup from the full Compustat sample. The gap between the two is due to the inclusion of firms with missing SG&A values. Similar to Figure 1 for all sectors, using the full Compustat sample for manufacturing, the average markup increases somewhat from 1980 to 1990, and then is roughly flat, and the overall rise is much smaller than what is obtained with the DEU Compustat sample. The dashed green line shows the changes in the average markup that DEU obtains for manufacturing using the Census data. The changes in markups from the Census estimates appear to more closely track those of the full Compustat sample than those of DEU's restricted sample.

We now turn to the markup estimates for the wholesale and retail sectors. Recall that these estimates also rely on the same Compustat estimates obtained earlier. Nevertheless, in both cases we find that the Census estimates are quite different from the Compustat ones. For wholesale, DEU estimates that markups decrease from 14.00 in 1982 to 6.00 in 2012 in the Census (that is, 1400% to 600%, DEU Figure VI(E)), while in Compustat, their markups estimates are much lower in level, and are roughly flat at around 1.15 (115%, see DEU Appendix 12.1). We therefore respectfully disagree with the assertion that "figures for wholesale are again in line with the series obtained from our analysis in the Compustat sample." The comparison for retail is similar, if less stark: DEU estimates a large increase in markups in the Census analysis from around 2.00 to over 3.00, (DEU Figure Vi (C)), while they estimate markups in Compustat that are broadly decreasing (DEU Appendix 12.4).

Our conclusions from this analysis are therefore different from those of DEU. We conclude that the Census estimates do not generally support the Compustat estimates. For manufacturing, the changes in markups over time from DEU's Census analysis better match those from the full Compustat sample than they do those from DEU's restricted sample. For retail and wholesale, the estimated markups from the Census do not generally match those from Compustat.

[13]Foster et al. (2024) also estimates markups using the full production approach on the Census data, estimating output elasticities using a production function, and finds markup increases that are more muted than those reported in DEU.

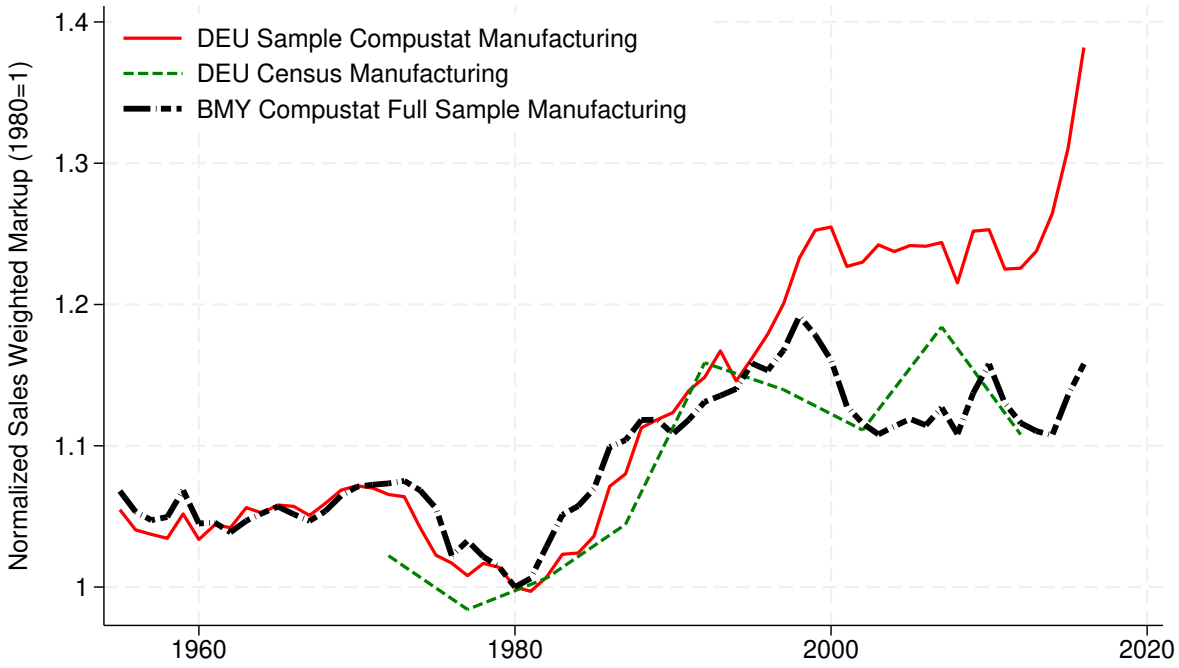

Figure 3: Comparison to DEU Census Results for Manufacturing

Notes: The figure compares the changes in markups over time from three sets of estimates: (1) the DEU Compustat sample, (2) the DEU computed estimates for manufacturing from the economic census, and (3) the full Compustat sample. Because the levels of the Census estimates are much higher than those from Compustat, all three series have been rescaled to equal one in 1980. The solid red line is the DEU sample replication for NAICS sectors 31, 32, and 33. The dashed green line is derived from DEU's Figure VI for manufacturing. The black dash - dot line is the full sample for NAICS codes 31, 32, and 33.

5 Conclusion

The results of DEU are sensitive to unstated data sample restrictions that exclude 27% of the observations available for use in the analysis. When we modify the DEU code to include these observations, we find that the increase in overall average markups is no longer robust. It is almost entirely driven by a single sector and is likely due mainly to an accounting issue that strongly affects the estimates for firms in that sector, rather than being due to economic forces. Excluding this sector, the estimated average markups obtained using the production method on the Compustat data are modest.

Furthermore, in the full Compustat sample, within-firm markups have been declining over time, which is inconsistent with broad-based declines in the competitive environment. The robustness analysis using Census data also does not support a large increase in average markups. We conclude that the DEU methodology and data, as they are described in the article, do not support the conclusion that broad-based increases in

market power have occurred in recent decades.

References

Berry, Steven, Martin Gaynor, and Fiona Scott Morton, "Do Increasing Markups Matter? Lessons from Empirical Industrial Organization," *Journal of Economic Perspectives*, 2019, *33* (3), 44–68.

Council of Economic Advisers, "Economic Report of the President," Technical Report, The White House April 2022.

Foster, Lucia, John Haltiwanger, and Cody Tuttle, "Rising Markups or Changing Technology?," 2024. NBER Working Paper 30491.

Loecker, Jan De, Jan Eeckhout, and Gabriel Unger, "The Rise of Market Power and the Macroeconomic Implications," *The Quarterly Journal of Economics*, 2020, *135* (2), 561–644.

Philippon, Thomas, *The Great Reversal: How America Gave Up on Free Markets*, Cambridge, MA: Harvard University Press, 2019.

Shapiro, Carl, "Antitrust: What Went Wrong and How to Fix It," *Antitrust*, 2021, *35* (3), 33–45.

Syverson, Chad, "Macroeconomics and Market Power: Context, Implications, and Open Questions," *Journal of Economic Perspectives*, 2019, *33* (3), 23–43.

U.S. Department of the Treasury, "The State of Labor Market Competition," Report, U.S. Department of the Treasury March 2022.

Appendix Materials

A Production Function Estimation

To recover markups, we estimate production functions using the regression model of DEU. The key parameters of interest are the elasticities of output with respect to COGS. The regression model for estimating these parameters is described in the DEU appendix, but the publicly provided replication package does not contain estimation code for this purpose – instead, the public replication package takes as given the estimated output elasticities, which are treated as data. Thus, we also rely on additional code provided to us by one of the authors that estimates these parameters. In this appendix, we describe the model and its implementation.

To start, DEU specifies a Cobb-Douglas production function for the baseline specification. For firm i and year t,

$$q_{it} = \theta_t^V v_{it} + \theta_t^K k_{it} + \omega_{it} + \epsilon_{it} \tag{A.1}$$

where q_{it}, v_{it}, and k_{it} are log output, the log quantity of the variable input, and log capital, respectively, ω_{it} is a persistent productivity shock that is known to the firm when it chooses v_{it}, and ϵ_{it} is a productivity shock that is realized after input decisions are made. The parameters, θ_t^V and θ_t^K are output elasticities.

Compustat provides revenue and expenditures, rather than quantities. Adding and subtracting prices obtains the following conversion:

$$p_{it} + q_{it} = \theta_t^V \left(p_{it}^V + v_{it}\right) + \theta_t^K \left(p_{it}^K + k_{it}\right) + \omega_{it} + \epsilon_{it}^* \tag{A.2}$$

where the left-hand side is log revenue ($p_{it} + q_{it}$), the right-hand side depends on log expenditures ($p_{it}^V + v_{it}$ and $p_{it}^K + k_{it}$), and the unobservables include a wedge between the output and input prices, as $\epsilon_{it}^* \equiv \epsilon_{it} + p_{it} - \theta_t^V p_{it}^V - \theta_t^K p_{it}^K$.

DEU maintains the assumption of Markov transitions for the persistent productivity shock: $\omega_{it} = g(\omega_{it-1}) + \xi_{it}$. They also assume that investment is monotonic in productivity and capital, allowing for the expression: $\omega_{it} = h_t(i_{it}, k_{it}, z_{it})$, where $h_t()$ is referred to as the control function, and z_{it} contains control variables that DEU states are intended to control for the wedge between input and output prices.[14] In the code that we were

[14]Appendix A (p. 632) states, for z_{it}, "we consider market share, measured at various levels of aggregation (two, three, and four digit), to take into account additional variation in output and input markets."

supplied, control variables are not used in the baseline specification. We therefore omit z_{it} from the model hereafter. We also omit ϵ^*_{it} in order to better track the DEU regression model though, absent z_{it}, it should still be present.

Placing these restrictions into equation (A.2), and substituting variable names, the model then becomes:

$$\log(Sales_{it}) = \theta_t^V \log(COGS_{it}) + \theta_t^K \log(Capital_{it}) + \beta_{1t} \log(Investment_{it-1}) + \beta_{2t} \log(Capital_{it-1}) + \beta_{3t} \log(Capital_{it-1})^2 + \xi_{it} \quad \text{(A.3)}$$

where the control function is specified as being linear in investment and quadratic in capital. DEU estimates the production function of equation (A.3) using 2SLS, treating COGS as an endogenous regressor. The excluded instrument is lagged COGS. The orthogonality conditions are provided in equation (27) of DEU Appendix A.

As we have specified the model, the coefficients are time-varying, and DEU also lets them vary across 2-digit NAICS sectors. Depending on the sector, constant coefficients are imposed before either 1972 or 1985. For each subsequent year, the regression samples are constructed using observations from within two years, i.e., they use 5-year rolling samples. The 2SLS regression is then estimated separately on each of these samples.

B Additional Issues and Discrepancies

B.1 Sample Restrictions

In addition to the two discrepancies described in the main text, we have identified two additional discrepancies between the sample restrictions described in the article and those used in the code. They do not meaningfully affect the results, but we report them for completeness. First, the DEU article states that observations in the top and bottom percentiles of the ratios of COGS to Sales and SG&A to Sales are dropped. Only the former screen appears in the code. We use both screens in our full sample results. Second, the DEU code drops observations in the top and bottom percentiles of the ratios of COGS to variable cost and COGS to total cost, where variable cost is defined as the sum of COGS and Capital and total cost is defined as the sum of COGS, Capital, and SG&A. These screens are not described in the article, and we do not use them for our full sample results.

Even with the replication package and the additional code provided by one of the

authors, we are unable to precisely replicate the main results of DEU without relying on an additional dataset provided by one of the authors that lists explicitly the firm-years included in their analysis. The additional dataset features approximately five thousand fewer firm-year observations than what we obtain using the code that ostensibly creates the dataset. Specifically, the replication code generates a dataset with 248,390 observations, while the article claims 247,644 observations (Table B.1 in DEU), and the dataset provided by the authors contains 242,645 observations.

B.2 Figures in DEU

We identified two mistakes in the code used to generate figures. First, Figure A.1 in DEU reports that the OP and ACF output elasticities are similar. However, the line labeled "ACF" erroneously provides the baseline OP output elasticities and the line labeled "OP" provides output elasticities using the same OP approach, but with a more flexible control function. While the ACF code we were provided does not provide reasonable estimates for a few years, the overall pattern across the years is similar to the baseline model.

Second, Figure XVIa in DEU examines COGS-weighted average markups. The code that generates the figure contains an error. Specifically, the code averages the cost-share based markup estimate rather than the baseline estimate. The dashed purple line in Figure C.4 contains the corrected COGS-weighted average markup for the DEU sample. It increases by about five percentage points less than what is reported in DEU.

C Additional Figures and Tables

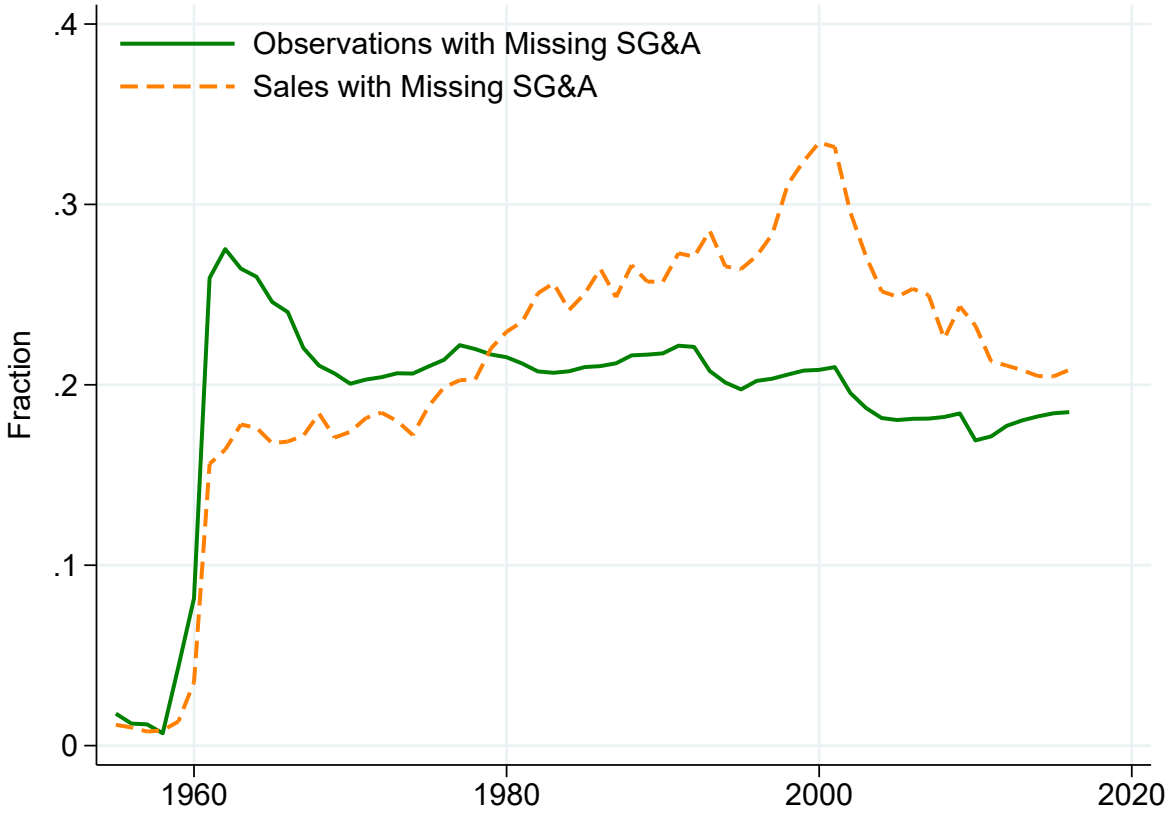

Figure C.1: Summary of Missing SG&A Values over Time

Notes: The figure plots the fraction of otherwise usable observations have missing values for SG&A over the sample period, both unweighted (solid green line) and weighted by sales (dashed orange line).

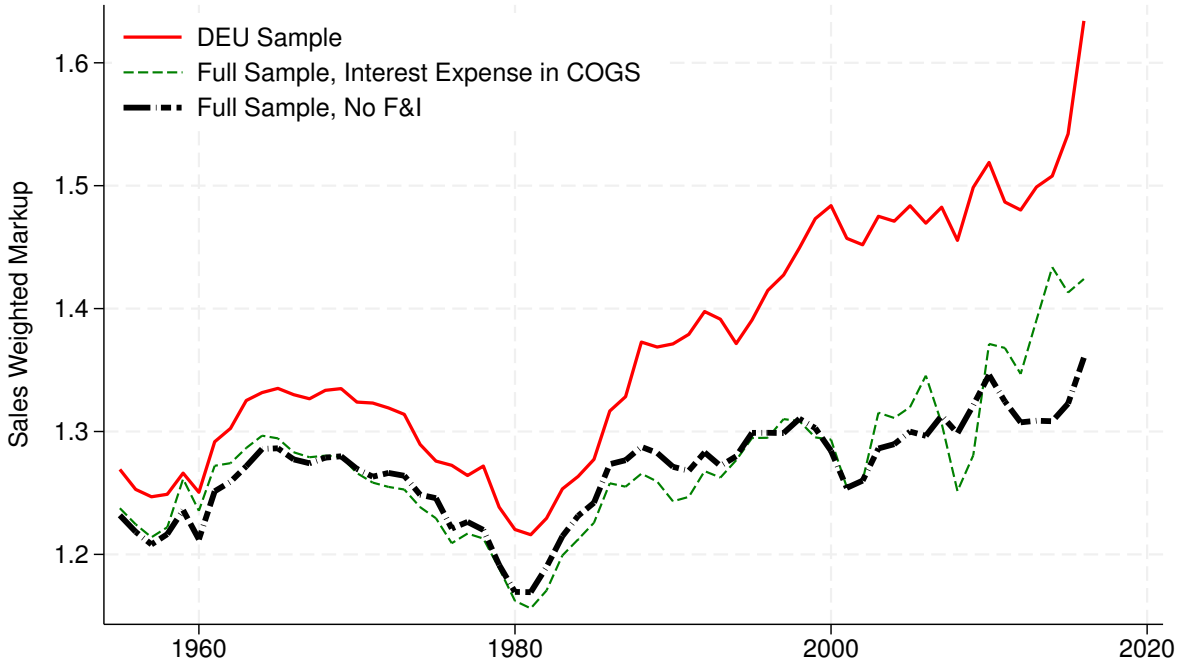

Figure C.2: Markups Estimates that Incorporate Interest Expense in COGS

Notes: The figure plots estimates of the sales-weighted average markup over time. The solid red line is a replication of Figure I of DEU, which uses a restricted sample. The black dash - dot line uses the full sample except for the F&I sector. The dashed green line uses the full sample, including F&I, but incorporates a data correction that adds interest expense to COGS.

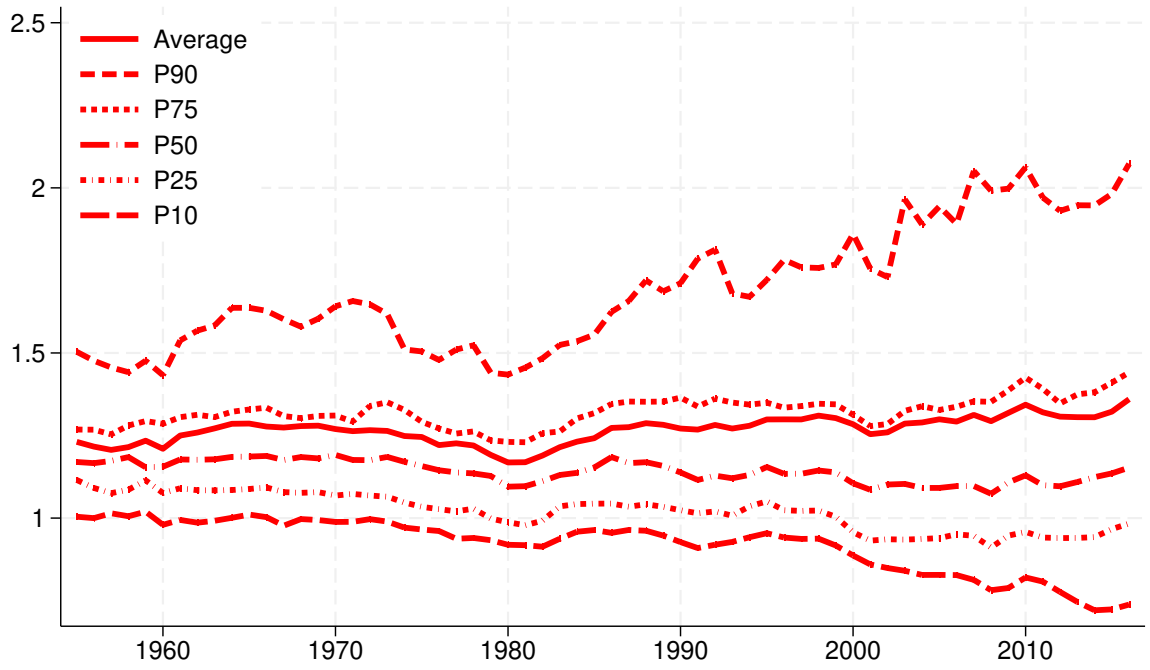

Figure C.3: Markup Percentiles

Notes: The solid line is the sales-weighted average from Figure 1. Each of the dashed lines corresponds to a sales-weighted percentile.

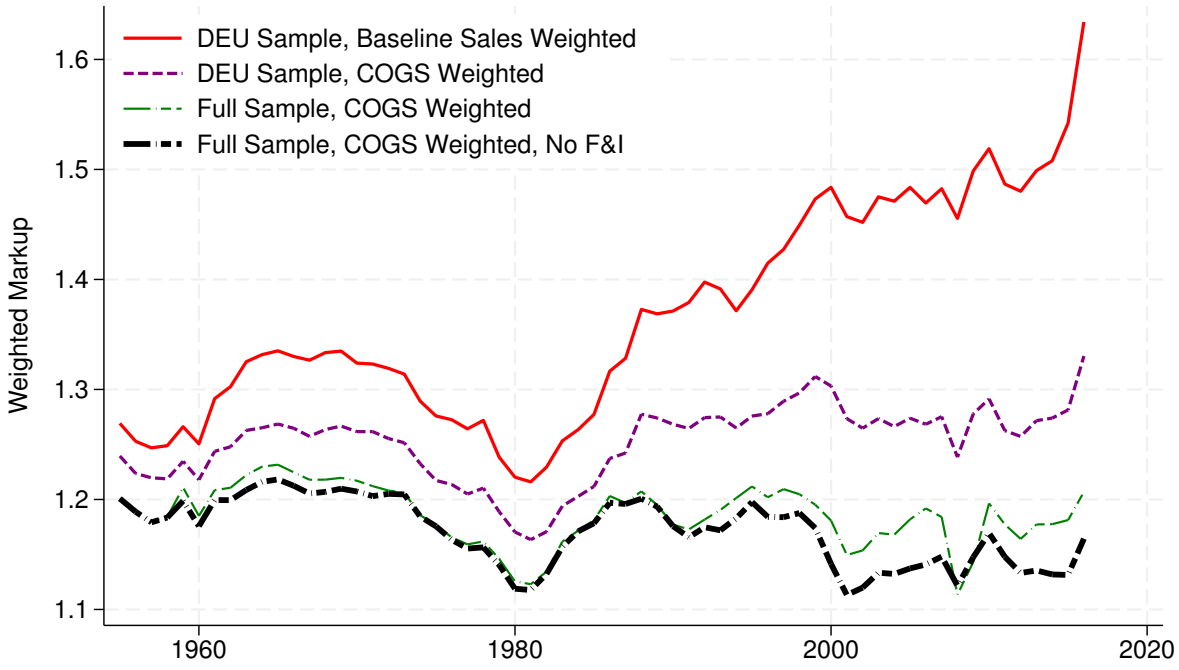

Figure C.4: COGS-Weighted Average Markups

Notes: The figure plots estimates of the sales-weighted and COGS-weighted average markup over time. The solid red line is a replication of Figure I of DEU, which uses a restricted sample. The dashed purple line is the DEU sample with COGS weighting (corrected version of Figure XVI(A) of DEU). The green dash - dot line uses the full sample with COGS weighting. The black dash - dot line is the full sample excluding F&I, with COGS weighting.

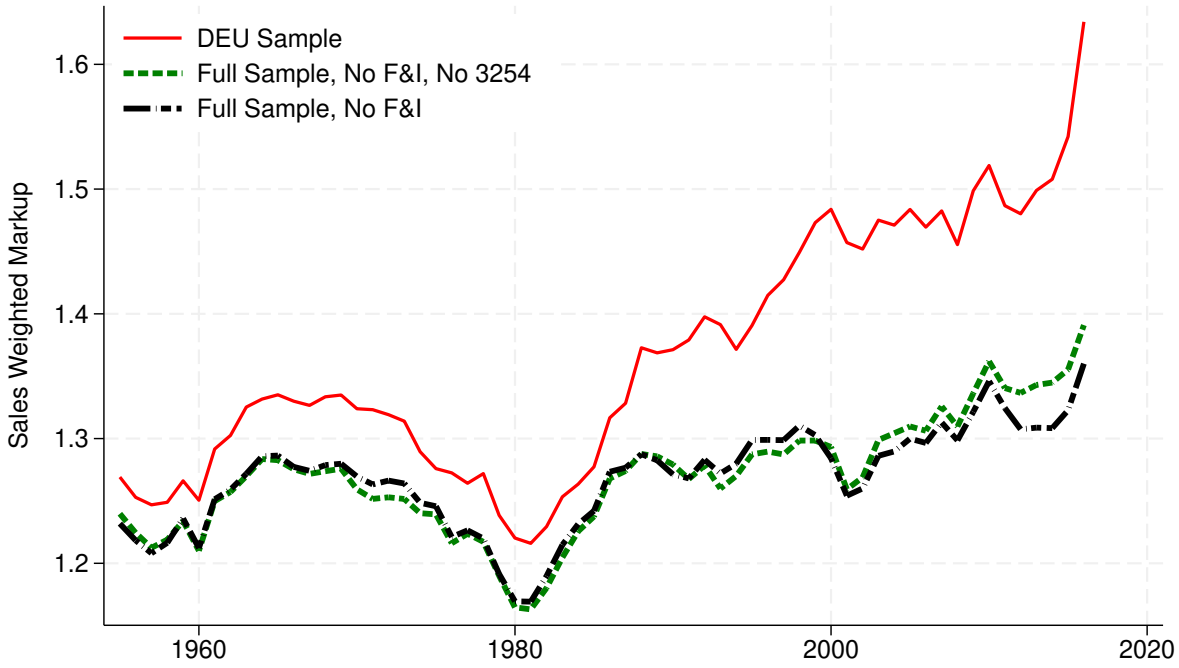

Figure C.5: Results without the NAICS Code 3254

Notes: The figure plots estimates of the sales-weighted average markup over time. The solid red line is a replication of Figure I of DEU, which uses a restricted sample. The dashed green line is the full sample excluding F&I and NAICS code 3254. The black dash - dot line is the full sample excluding F&I.

Table C.1: Summary of Missing SG&A Values by 2-Digit NAICS Code

NAICS	Definition	Share of Sales (%)	Missing SG&A (%)	
			Observations	Sales
11	Agriculture, Forestry, Fishing and Hunting	0.15	12.19	1.83
21	Mining, Quarrying, and Oil and Gas Extraction	3.56	9.09	23.27
22	Utilities	5.65	90.82	94.37
23	Construction	0.55	10.93	7.77
31	Manufacturing	4.97	4.97	8.42
32	Manufacturing	18.13	15.50	7.32
33	Manufacturing	20.22	4.27	8.44
42	Wholesale Trade	4.06	7.38	5.82
44	Retail Trade	3.95	8.45	9.74
45	Retail Trade	4.91	5.33	6.50
48	Transportation and Warehousing	3.07	41.40	54.35
49	Transportation and Warehousing	0.66	31.78	79.06
51	Information	8.69	19.61	32.60
52	Finance and Insurance	15.23	38.85	50.40
53	Real Estate and Rental and Leasing	0.70	41.60	34.05
54	Professional, Scientific, and Technical Services	1.34	11.53	8.94
56	Administrative and Support and Waste Management and Remediation Services	0.61	11.12	7.64
61	Educational Services	0.08	5.63	2.14
62	Health Care and Social Assistance	0.83	24.20	28.64
71	Arts, Entertainment, and Recreation	0.11	26.36	9.61
72	Accommodation and Food Services	0.81	14.75	21.89
81	Other Services (except Public Administration)	0.08	6.74	2.93
99	Unclassified	1.63	17.75	18.20

Notes: Compustat assigns each firm-year observation to a 2-digit NAICS code. The table provides, for each code, (1) the share of total Compustat sales accounted for by firm-year observations assigned to the code, (2) the fraction of firm-year observations assigned to the code for which SG&A is missing, (2) and the proportion of all sales of firm-year observations assigned to the code that are due to firms-year observations for which SG&A is missing.