

**Association Between Locoregional Private Equity Investment in Retina Practices and Academic  
Vitreoretinal Caseload**

Jovany J. Franco, MD, Warren W. Pan, MD, PhD, Shahzad I. Mian, MD, and Thomas J. Wubben, MD,  
PhD

**Online-Only Supplemental Material**

**Supplemental Figure 1.** Flow diagram of identified, excluded, and included retinal detachment (RD) pars plana vitrectomy (PPV) and routine PPV cases.

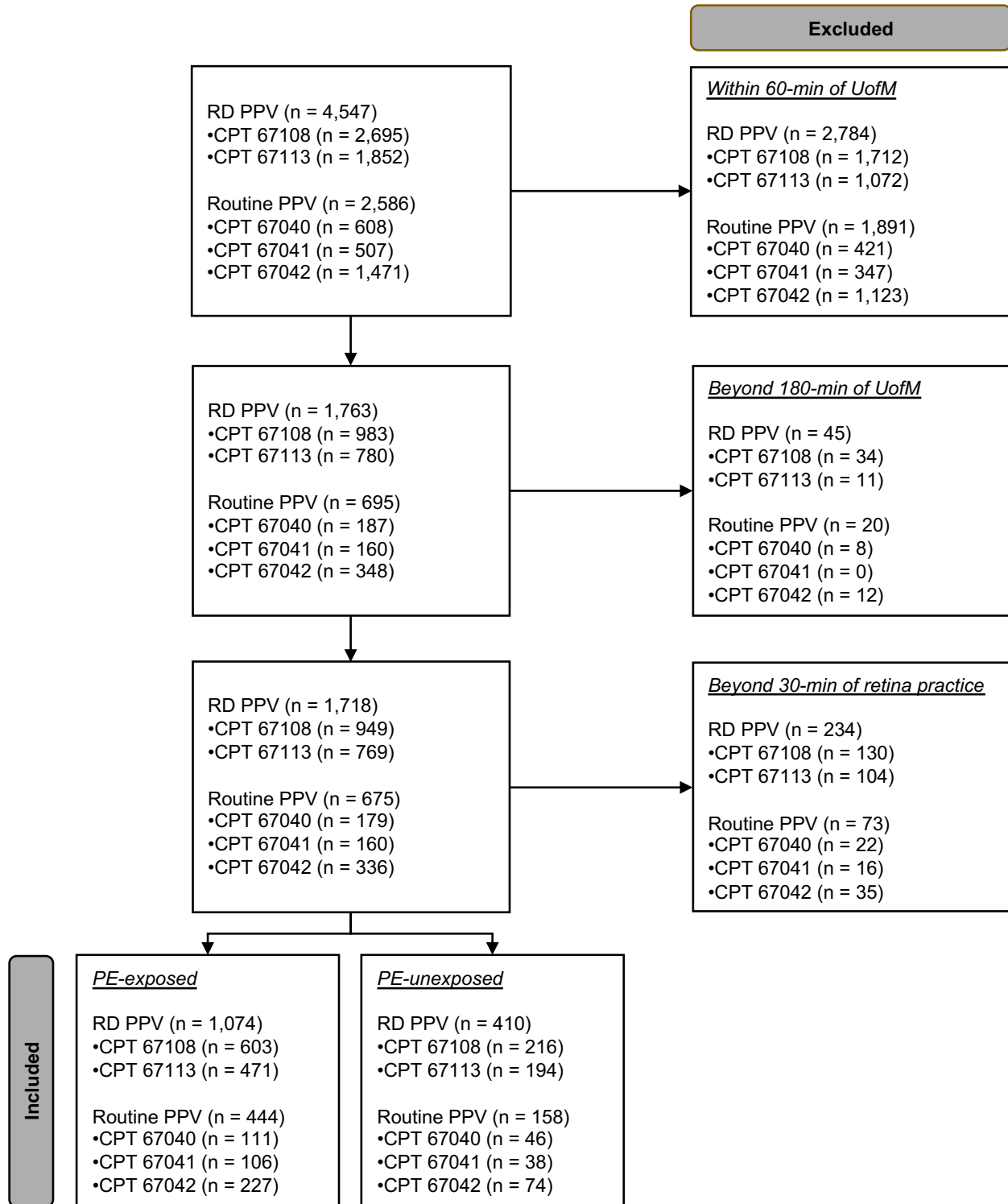
**Supplemental Figure 2.** Adjusted difference-in-differences (DiD) estimates of the association between private equity (PE) exposure and retinal detachment (RD) pars plana vitrectomy (PPV) or routine PPV case rate without population weighting factor.

**Supplemental Figure 3.** Adjusted difference-in-differences (DiD) estimates of the association between private equity (PE) exposure and retinal detachment (RD) pars plana vitrectomy (PPV) or routine PPV case rate using only the “never treated” control group.

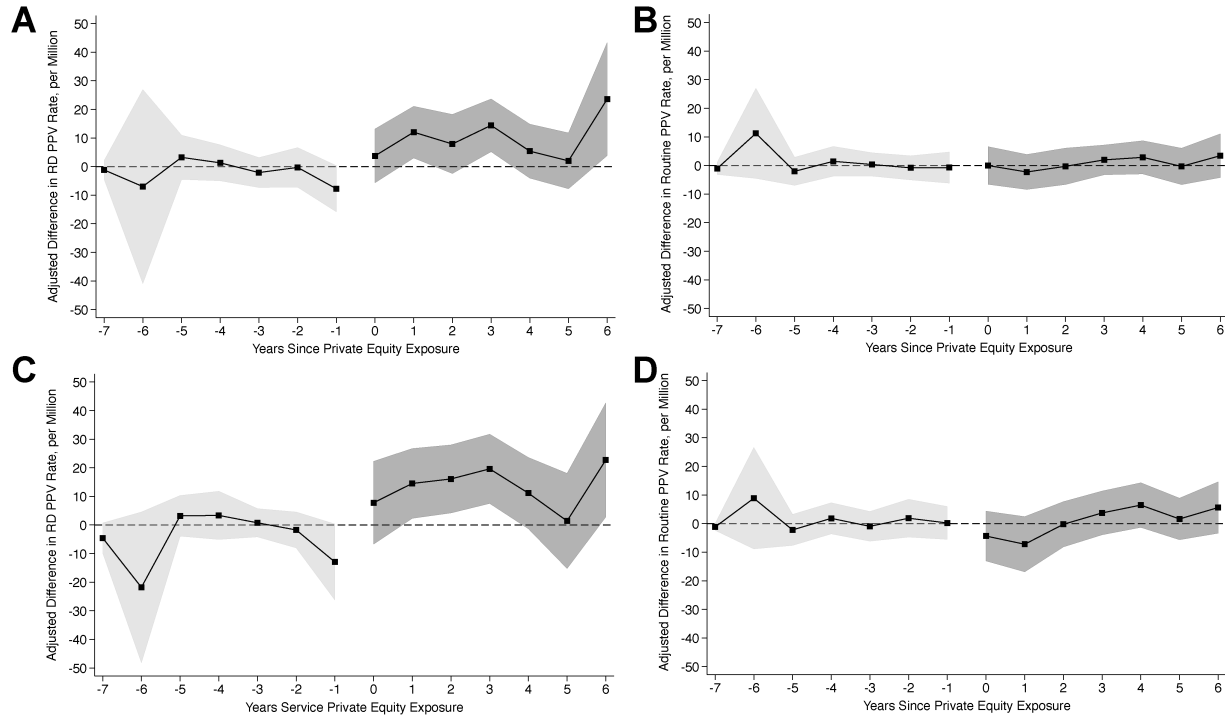
**Supplemental Figure 4.** Adjusted difference-in-differences (DiD) estimates of the association between private equity (PE) exposure and retinal detachment (RD) pars plana vitrectomy (PPV) or routine PPV case rate using windowed data.

**Supplemental Table 1.** Anonymized list of private equity (PE)-exposed retina practices with locations in Michigan, Ohio, and Indiana with dates of initial PE backing.

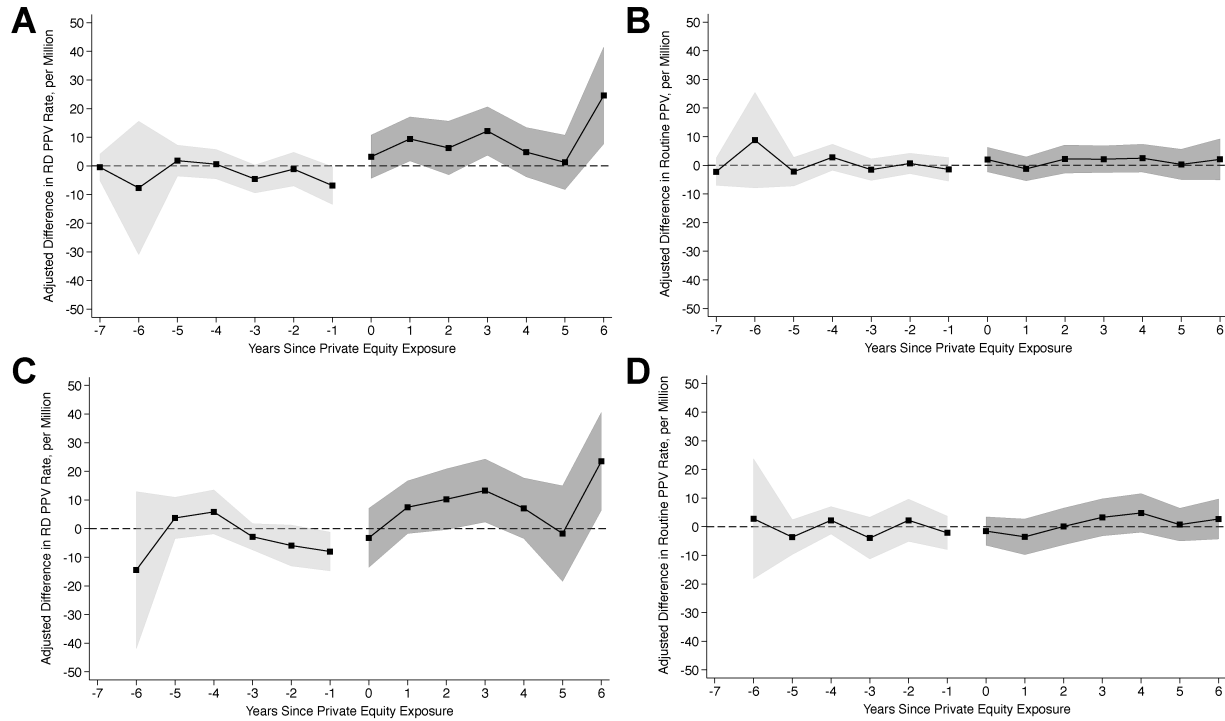
**Supplemental Table 2.** Aggregate tract-level demographics for private equity (PE)-exposed and PE-unexposed tracts derived from the 2018-2022 U.S. Census American Community Survey (ACS) 5-year estimates.



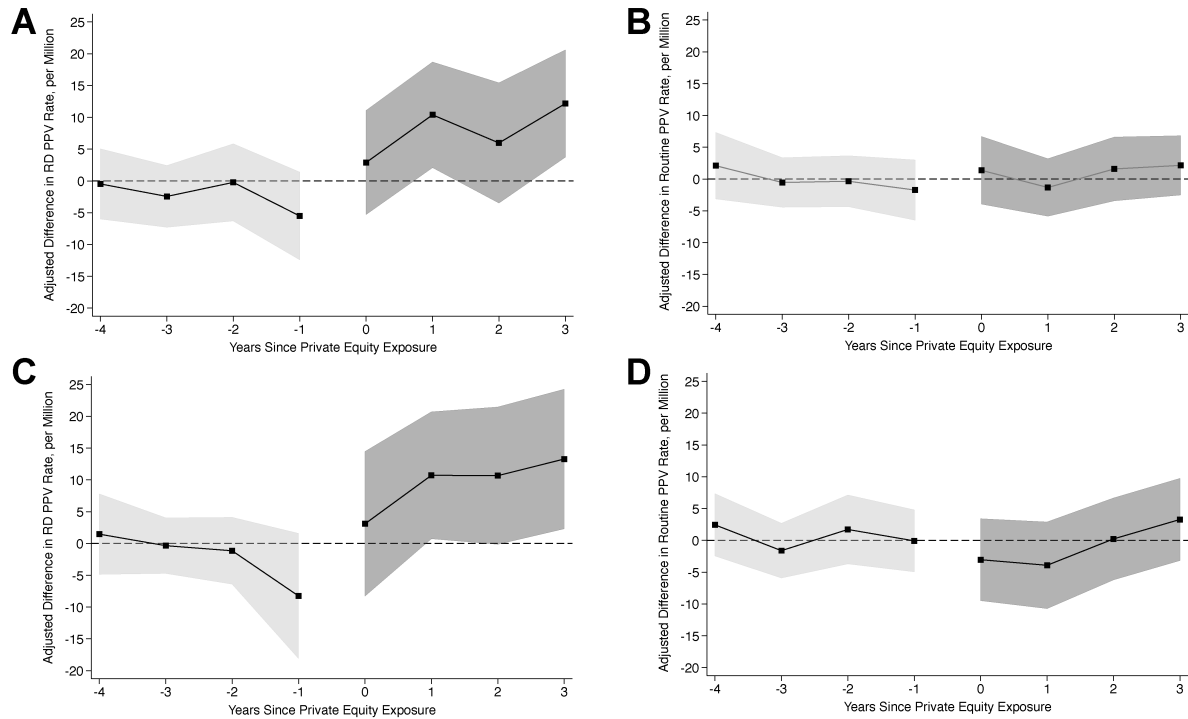
**Supplemental Figure 1. Flow diagram of identified, excluded, and included retinal detachment (RD) pars plana vitrectomy (PPV) and routine PPV cases. CPT, Current Procedural Terminology. UofM, University of Michigan. PE, private equity**



**Supplemental Figure 2. Adjusted difference-in-differences (DiD) estimates of the association between private equity (PE) exposure and retinal detachment (RD) pars plana vitrectomy (PPV) or routine PPV case rate without population weighting factor. A,C.** Adjusted difference in annual, tract-level RD PPV case rate (per million) between PE-exposed and PE-unexposed tracts using DiD model without (A) covariate control (average treatment effect on the treated [ATT]: +8.85, 95% confidence interval [CI]: [1.64 – 16.07],  $p = 0.02$ ) and with (C) covariate control (ATT: +13.58, 95% CI: [3.66 – 23.48],  $p = 0.01$ ). **B,D.** Adjusted difference in annual, tract-level routine PPV case rate (per million) between PE-exposed and PE-unexposed tracts using model without (B) covariate control (ATT: +0.45, 95% CI: [-4.25 – 5.16],  $p = 0.85$ ) and with (D) covariate control (ATT: -0.19, 95% CI: [-6.20 – 5.83],  $p = 0.95$ ).



**Supplemental Figure 3. Adjusted difference-in-differences (DiD) estimates of the association between private equity (PE) exposure and retinal detachment (RD) pars plana vitrectomy (PPV) or routine PPV case rate using only the “never treated” control group. A,C.** Adjusted difference in annual, tract-level RD PPV case rate (per million) between PE-exposed and PE-unexposed tracts using model without (A) covariate control (average treatment effect on the treated [ATT]: +7.47, 95% confidence interval [CI]: [1.15 – 13.79],  $p = 0.02$ ) and with (C) covariate control (ATT: +7.06, 95% CI: [-0.87 – 14.00],  $p = 0.08$ ). **B,D.** Adjusted difference in annual, tract-level routine PPV case rate (per million) between PE-exposed and PE-unexposed tracts using model without (B) covariate control (ATT: +1.46, 95% CI: [-2.16 – 5.08],  $p = 0.43$ ) and with (D) covariate control (ATT: +0.63, 95% CI: [-4.00 – 5.26],  $p = 0.79$ ).



**Supplemental Figure 4. Adjusted difference-in-differences (DiD) estimates of the association between private equity (PE) exposure and retinal detachment (RD) pars plana vitrectomy (PPV) or routine PPV case rate using windowed data. A,C.** Adjusted difference in annual, tract-level RD PPV case rate (per million) between PE-exposed and PE-unexposed tracts using model without (A) covariate control (average treatment effect on the treated [ATT]: +7.86, 95% confidence interval [CI]: [0.79 – 14.92],  $p = 0.03$ ) and with (C) covariate control (ATT: +9.44, 95% CI: [1.02 – 17.86],  $p = 0.03$ ). **B,D.** Adjusted difference in annual, tract-level routine PPV case rate (per million) between PE-exposed and PE-unexposed tracts using model without (B) covariate control (ATT: +0.95, 95% CI: [-3.12 – 5.02],  $p = 0.65$ ) and with (D) covariate control (ATT: -0.86, 95% CI: [-6.04 – 4.31],  $p = 0.74$ ).

**Supplemental Table 1.** Anonymized list of private equity (PE)-exposed retina practices with locations in Michigan, Ohio, and Indiana with dates of initial PE backing.

Practice <sup>†</sup>	Date	Transaction Type
1.	02/23/2017	LBO/Buyout
2.	03/29/2018	PE Growth/Expansion/Platform Formation
3.	08/09/2018	LBO/Buyout
4.	10/11/2018	LBO/Buyout
5.	10/24/2018	LBO/Buyout
6.	01/08/2019	LBO/Buyout
7.	06/27/2019	LBO/Buyout/Platform Formation
8.	10/03/2019	LBO/Buyout
9.	09/05/2019	LBO/Buyout
10.	12/19/2019	LBO/Buyout
11.	12/20/2019	LBO/Buyout
12.	01/30/2020	LBO/Buyout
13.	01/01/2021	LBO/Buyout
14.	01/01/2021	LBO/Buyout
15.	01/04/2021	LBO/Buyout
16.	04/23/2021	LBO/Buyout
17.	12/31/2021	LBO/Buyout
18.	03/31/2022	LBO/Buyout
19.	04/26/2022	LBO/Buyout
20.	11/02/2022	LBO/Buyout
21.	02/09/2023	LBO/Buyout

LBO, leveraged buyout

<sup>†</sup>Practices involved in PE transactions (hereon, “PE-exposed”) from 2013-2023 were identified through manual review of the Capital IQ (S&P Global, U.S.), ThomsonOne (London Stock Exchange Group, England), PitchBook (Pitchbook, U.S.), Orbis M&A (Moody’s, U.S.), and PrivCo (PrivCo, U.S.) profiles for all practices in our database, with attention to listed merger and acquisition, PE, and venture capital transactions. For larger parent practices or platform companies formed from several subsidiary practice acquisitions, attempts were made to identify the date of PE exposure for each individual physical address. This was achieved through review of archived webpages for acquired practices (Wayback Machine, Internet Archive, U.S.). Locations not listed on the archived websites of these absorbed practices were assumed to have been exposed to PE at the time of parent practice PE-backing.

**Supplemental Table 2.** Aggregate tract-level demographics for private equity (PE)-exposed and PE-unexposed tracts derived from the 2018-2022 U.S. Census American Community Survey (ACS) 5-year estimates.

	<b>PE-exposed (n = 1,898 tracts)</b>	<b>PE-unexposed (n = 611 tracts)</b>	
	<b>Mean (SD)</b>	<b>Mean (SD)</b>	<b>p-value</b>
<b><i>Demographic Variable</i></b>			
Older-aged (>50yrs), %	38.2 (9.9)	37.8 (10.2)	0.39
White, %	75.8 (24.5)	80.4 (20.3)	*<0.001
Female, %	50.6 (5.1)	50.1 (5.6)	0.03
College-educated (≥Associate’s Degree), %	40.2 (17.6)	34.1 (15.0)	*<0.001
Median Household Income, \$	73,758 (32,366)	63,422 (21,543)	*<0.001
Without automobile, %	7.8 (8.9)	6.8 (6.8)	0.02
Uninsured, %	5.4 (3.7)	7.1 (4.9)	*<0.001
Without internet, %	9.8 (6.9)	11.3 (6.4)	*<0.001

SD, standard deviation  
 \*, statistically significant