

Supplemental Material

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eTable 1. Comparison of Automobile NOx/PM Act by the Japanese Government and Regulations by the Tokyo Metropolitan Government and Osaka Prefectural Government.

	Automobile NOx / PM Act by Japanese Government	Tokyo Metropolitan Government ^a and three neighboring prefectures (Saitama, Chiba, and Kanagawa)	Osaka Prefectural Government ^a
Content of Law or Ordinance	Restrict registration of vehicles which do not suffice emission standards in metropolitan areas (including Tokyo Metropolitan Government and Osaka Prefectural Government)	Restrict traveling of vehicles which do not suffice emission standards	Restrict departing or arriving of vehicles which do not suffice emission standards
Targeted pollutants	NOx and PM	PM	NOx and PM
Targeted vehicles	Trucks, buses, special purpose motor vehicles, and diesel vehicles	Diesel trucks, diesel buses, and diesel special purpose motor vehicles	Trucks, buses, and special purpose motor vehicles
Year of the start of the regulation	October 2002	October 2003 Enforced in April 2006 (Tokyo Metropolitan Government and Saitama)	January 2009
Note	Replaced previous Automobile NOx Act which started in 1992		

NOx denotes Nitrogen Oxide; PM denotes Particulate Matter. ^a Tokyo's 23 wards belong to the Tokyo Metropolitan Government and Osaka belongs to the Osaka Prefectural Government. Source: Osaka Prefectural Government

eTable 2. Characteristics of Tokyo's 23 Wards and Osaka in 2005.

	Tokyo's 23 wards	Osaka
Area characteristics		
Area (km ²)	621.35	222.11
Population (number)	8,489,653	2,628,811
Less than 15 years of age, n (%)	901,087 (10.6)	315,143 (12.0)
15 to 64 years of age, n (%)	5,882,251 (69.3)	1,749,851 (66.6)
Equal to or more than 65 years of age, n (%)	1,568,617 (18.5)	529,692 (20.1)
Population density (number per km ²)	13663.2	11835.6
Total number of workers	4,011,554	1,159,848
Primary industry, n (%)	7,100 (0.2)	1,052 (0.1)
Secondary industry, n (%)	717,552 (17.9)	290,005 (25.0)
Tertiary industry, n (%)	3,143,675 (78.4)	846,088 (72.9)
Mean per capita income (million yen) ^a	4.49	3.39
Characteristics related with air pollution		
Vehicles (number)	2,343,503	869,387
Coal-fired power plants within 50 km from the border (number)	0	0
Characteristics related with health ^b		
Hospitals (number)	430	200
Number per 1 million population	51	76
Clinics (number)	9,285	3,315
Number per 1 million population	1,094	1,261
Medical doctors (number)	27,305	8,332
Number per 1 million population	3,216	3,169

Obtained from census data in 2005, Statistical reports on the land area by prefectures and municipalities in Japan in 2005, Statistical observations of Shi, Ku, Machi, Mura in 2007, Kanto District Transport Bureau, Osaka Prefectural Government, Tokyo Electric Power Co., Kansai Electric Power Co. Numbers in each category may not equal the sum due to unknown category. ^a Mean per capita income was derived from dividing total tax revenue by the number of taxpayers. ^b Data in 2004.

eTable 3. Air Pollutant Concentrations in Tokyo's 23 Wards and Osaka, Separated by 3-Year Periods.

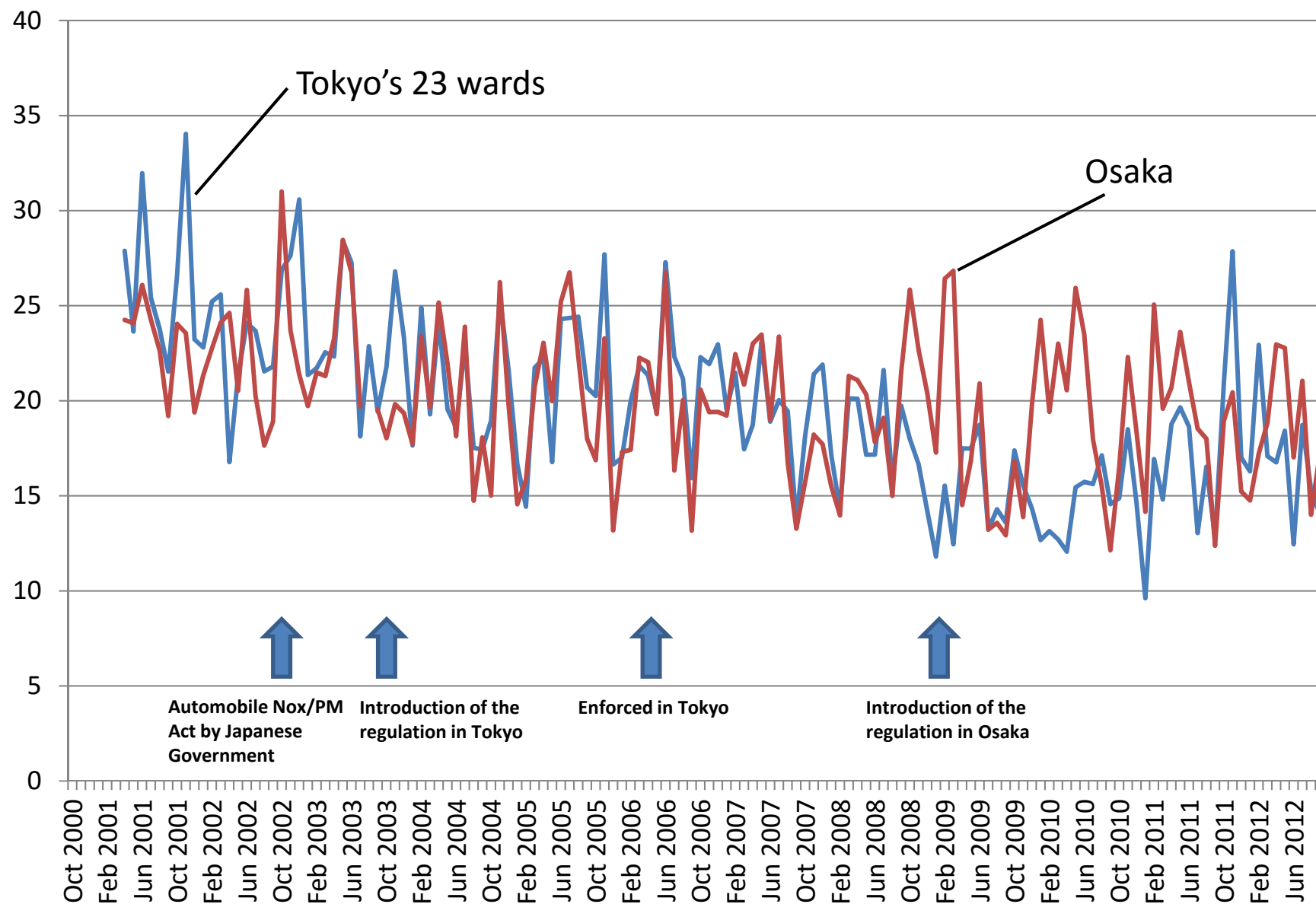
	Tokyo's 23 wards			Osaka		
	No. of days	Mean (SD)	Change in means from baseline	No. of days	Mean (SD)	Change in means from baseline
Air pollutants						
PM _{2.5} (µg/m ³)						
Oct 2000 to Sep 2003 ^a	861 ^b	24.4 (12.6)		848 ^b	22.7 (11.0)	
Oct 2003 to Sep 2006	1094	21.0 (11.0)	-3.4	1090	19.9 (9.3)	-2.9
Oct 2006 to Sep 2009	1096	18.0 (9.0)	-6.5	1056	19.1 (10.7)	-3.6
Oct 2009 to Sep 2012	1091	16.2 (8.4)	-8.3	1076	18.9 (10.6)	-3.8
NO ₂ (ppb)						
Oct 2000 to Sep 2003 ^a	1050	30.9 (11.7)		1063	29.7 (11.2)	
Oct 2003 to Sep 2006	1076	28.0 (10.7)	-2.8	1094	28.2 (10.0)	-1.4
Oct 2006 to Sep 2009	1096	24.3 (10.0)	-6.6	1090	25.0 (9.9)	-4.7
Oct 2009 to Sep 2012	1094	22.0 (9.3)	-8.9	1081	22.0 (8.6)	-7.7

SD denotes standard deviation; NO₂ denotes nitrogen dioxide; PM_{2.5} denotes particulate matter less than or equal to 2.5 µm.

^a Reference period. ^bBecause PM_{2.5} data were available since the middle of April 2001 in both areas, the number of days was the smallest in the first period.

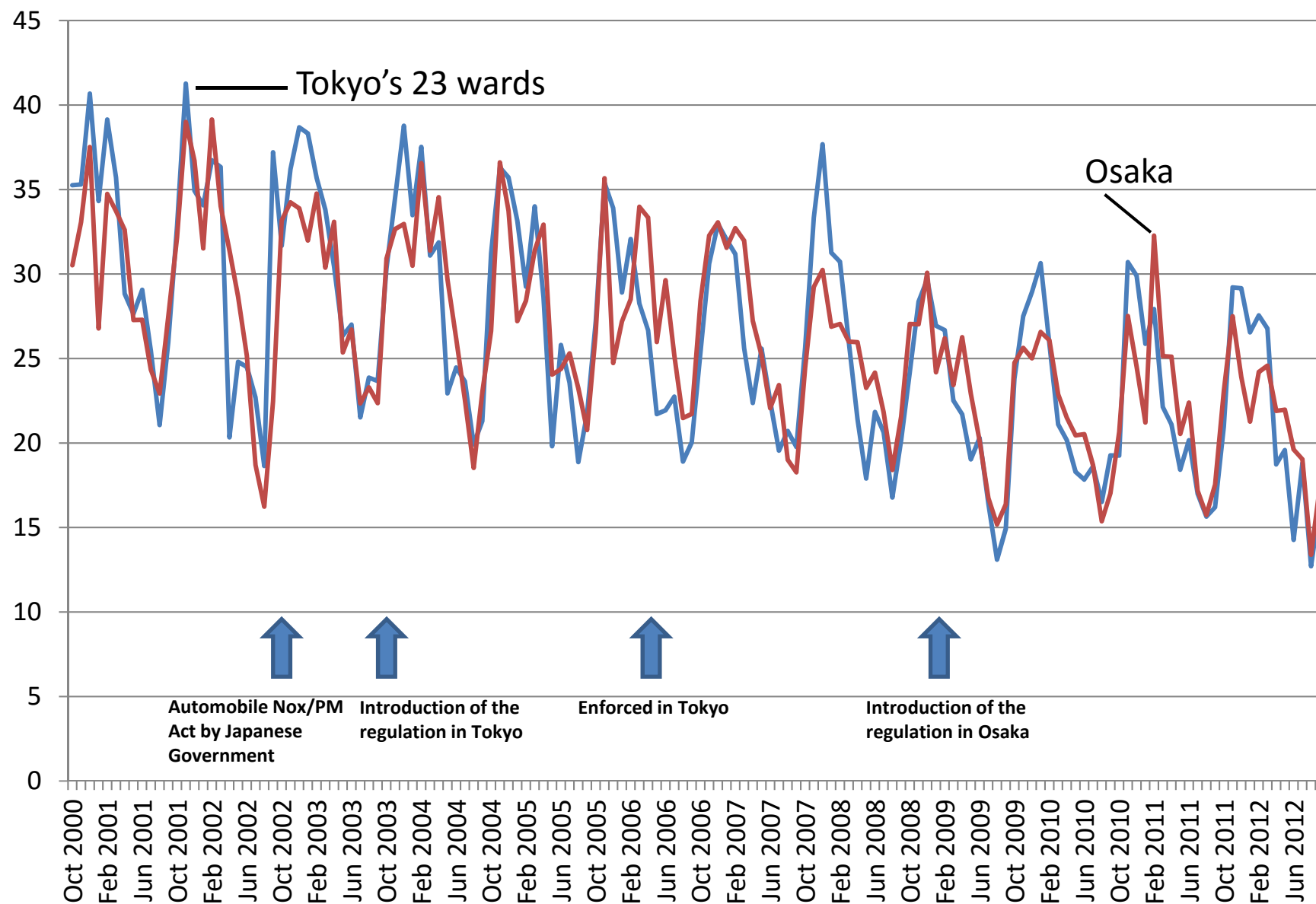
eFigure 1a. Trends in PM_{2.5}

($\mu\text{g}/\text{m}^3$)



eFigure 1b. Trends in NO₂

(ppb)



eFigure 2. Concentrations and percentages of elemental carbon in PM_{2.5}

