

WP/19/80

IMF Working Paper

You Are Suffocating Me!
Firm-Level Evidence on Crowding Out

by Serhan Cevik

I N T E R N A T I O N A L M O N E T A R Y F U N D

IMF Working Paper

Western Hemisphere Department

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April 2019

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Abstract

Literature on whether government spending crowds out or crowds in the private sector is large, but still without an unambiguous conclusion. Using firm-level data from Ukraine, this paper provides a granular empirical investigation to disentangle the impact of state-owned enterprises (SOEs) on private firm investment in Ukraine—a large transition economy. Controlling for firm characteristics and systematic differences across sectors, the results indicate that the SOE concentration in a given sector has a statistically significant negative effect on private fixed capital formation, and that the impact of SOEs is stronger in those industries in which SOEs have a more dominant presence. These findings imply that private firms operating in sectors with a high level of SOE concentration invest systematically less than businesses that are not competing directly with SOEs.

JEL Classification Numbers: E22, E62, F12, F14

Keywords: Fixed investment, state-owned enterprises, crowding-out effect, firm-level analysis

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* The author would like to thank David Amaglobeli, Marina Marinkov, Christine Richmond, and Sergio Sola for their comments and suggestions, and Fedor Miryugin for excellent research assistance.

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I. INTRODUCTION

Literature on whether government spending crowds out or crowds in the private sector is large, but still without an unambiguous conclusion. On the theoretical front, the relationship between government spending and economic growth can occur in either direction—an increase in government spending resulting in a decline in private consumption and investment due to a negative wealth effect and higher interest rates, or a rise in private consumption and investment because of higher disposable income and an increase in the expected return to capital (Aiyagari and others, 1990; Christiano and Eichenbaum, 1992; Baxter and King, 1993; Alesina and Perotti, 1997; Blanchard and Perotti, 2002). The theoretical ambiguity surrounding the effects of government spending on the private sector makes this an ideal empirical inquiry. Still, empirical studies yield a wide range of mixed findings at the macro level. Focusing on the United States over the period 1949–1985, Aschauer (1989) finds that public investment, especially on infrastructure, has a crowding-in effect on private investment by increasing productivity. Similarly, adopting a cross-country approach, Greene and Villanueva (1991), Easterly and Rebelo (1993), Erenburg and Wohart (1995), and Erden and Holcomber (2005) conclude that public investment has an enabling effect on private capital accumulation, especially in developing countries. Other studies, however, reach contradictory results indicating that public investment tends to crowd out private investment (Serven, 1999; Mamatzakis, 2001; Voss, 2002; Narayan, 2004; Mitra, 2006; Cavallo and Daude, 2011).

Using firm-level data, this paper disentangles the impact of state-owned enterprises (SOEs) on private firm investment. Most empirical studies investigate the relationship between public and private investment at the macro level, either focusing on a single country over time or undertaking a cross-country analysis. Large multi-country assessments, however, miss heterogeneity across sectors and firms, especially in a country where SOEs account for a substantial proportion of employment and output. To address this gap, a handful of papers utilize firm-level data and find that the greater concentration of SOEs tend to lower private investment in countries such as China, Côte d'Ivoire, Malaysia and Vietnam (Harrison and McMillan, 2003; Van Thang and Freeman, 2009; Xu and Yan, 2014; Menon and Ng, 2017). To the best of my knowledge, this paper is the first attempt to test whether SOEs crowd out fixed capital formation by private firms in a large transition economy like Ukraine where the state continues to play a dominant role. To this end, I use a large-scale dataset on 665,391 firms in 84 nonfinancial sectors during the period 1997–2016, and employ alternative approaches to estimate the determinants of private fixed investment with a focus on SOE density as an explanatory variable.

The empirical analysis presented in this paper indicates that SOEs crowd out private fixed investment spending in Ukraine. Ukraine has undergone economic transition since independence in 1991, bringing the liberalization of prices and markets and the privatization of SOEs. Even so, there is still a large number of SOEs with a sizable presence in Ukraine's economic landscape in terms of employment and output. Controlling for firm characteristics and systematic differences across sectors, the paper finds that the concentration of SOEs in a given sector—measured by the share in employment or revenues—has a statistically significant negative effect on private fixed investment at the firm level. The economic significance of this crowding-out effect on private enterprises is greater

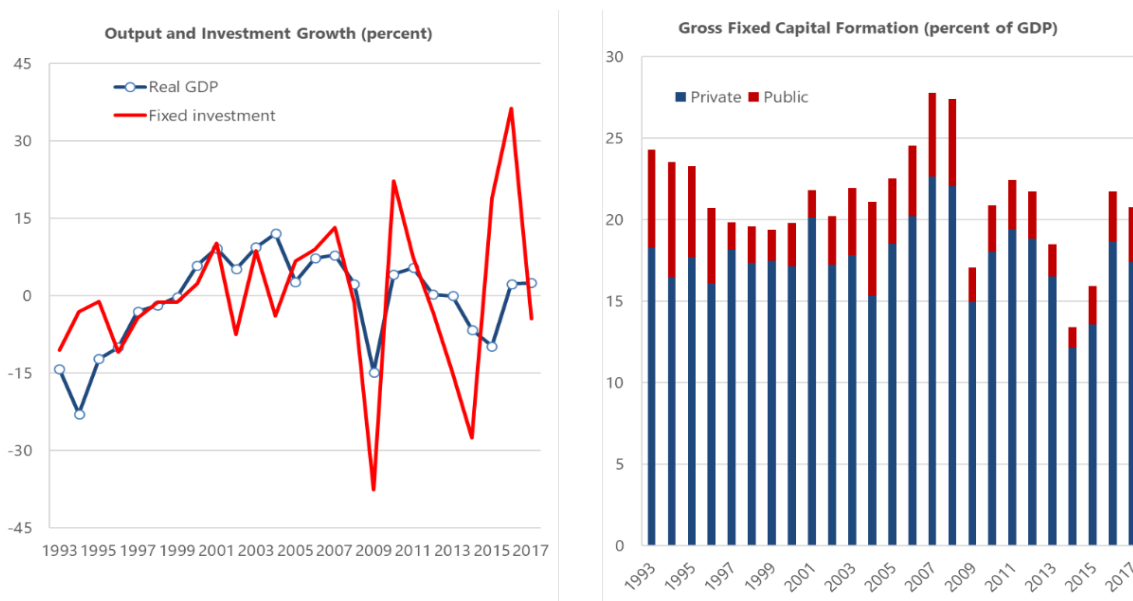
in manufacturing and in those sectors in which SOEs have a more dominant presence. These findings—robust to alternative methodologies and subsample estimations—indicate that private firms operating in industries with a high level of SOE concentration invest systematically less than businesses that are not competing directly with SOEs. Furthermore, the empirical results are likely to underestimate the full extent of the crowding-out effect of SOEs on private companies, since the firm-level dataset used in this paper covers only about 20 percent of SOEs currently operating in Ukraine during the sample period.

The rest of the paper is organized as follows. Section II describes data and stylized facts. Section III explains the econometric methodology. Section IV presents the empirical results, including various robustness checks. Section V provides concluding remarks and discusses policy implications.

II. DATA AND STYLIZED FACTS

Ukraine’s total fixed investment, including both public and private, has been on a steep downward trend since the onset of the global financial crisis. After peaking at 27.8 percent of GDP in 2007, gross fixed capital formation dropped precipitously to 13.4 percent by 2014 and then recovered to 20.8 percent as of 2017 (Figure 1). This pattern of investment dynamics is similar to the experience of other emerging economies, but the breadth, length and volatility of structural deceleration and cyclical swings in Ukraine are beyond compare. Public fixed investment is traditionally low in Ukraine—amounting to an average of 3.8 percent of GDP during the period 2000-2007 and 2.8 percent over the past decade—due to the lack of fiscal space and policy choices favoring current expenditures. This leaves the private sector as the major contributor to gross fixed capital formation, amounting to an average of 17.2 percent of GDP over the 2008-2017 period.

Figure 1. Growth and Capital Formation in Ukraine



Source: IMF, World Bank, author's calculations.

The firm-level dataset consists of annual observations and covers both listed and unlisted nonfinancial companies over the period 1997–2016. Harmonized firm-level financial data, including balance sheets and income statements, is obtained from the Orbis database compiled by Bureau van Dijk. Orbis has the distinct advantage of providing a comparable coverage of both public (listed) and private (non-listed) firms including small and medium-sized enterprises (SMEs). The complete Orbis sample consists of 665,781 Ukrainian companies with a total of 5,091,075 firm-year observations during the period spanning from 1997 to 2016. However, similar to any other large-scale micro dataset, the Orbis data require careful management to ensure consistency and comparability across firms and over time. Following the data cleaning principles suggested by Gal (2013) and Kalemlı-Ozcan and others (2015), firms with negative values of total assets, employment, revenues and sales in any given year are filtered out. To minimize the effect of outliers, I exclude 1 percent of observations on both tails of the distribution of firm-specific variables and firms in the conflict-affected areas after 2014. Accordingly, the final dataset used in this study has an unbalanced panel of 665,391 unique firms, with 2,926,520 firm-year observations over the 1997–2016 period.

Table 1. Sectoral Distribution of SOEs in Ukraine

Sector	Number of firms	(Percent of total)	
		Share of Employment	Share of Revenues
Agriculture	1.3	11.5	3.3
Mining	3.8	26.5	11.8
Manufacturing	1.3	8.8	3.9
Utilities	14.7	48.5	48.0
Construction	0.5	7.6	2.3
Real estate	1.3	11.8	3.3
Information technology	1.0	7.0	2.1
Other services	2.0	13.5	6.3
Wholesale and retail trade	0.3	1.6	0.6
Transportation and storage	1.7	46.5	38.5
Professional and administrative activities	2.0	21.8	43.9

Source: Orbis, author's calculations.

Table 1 presents the share of SOEs across 84 nonfinancial industries in the Ukrainian economy over the sample period.¹ Privatization since independence has brought down the government's share in the economy, but the Ministry of Development and Trade reports that there are still 1,833 SOEs operating (out of 3,350 registered SOEs) in a wide range of sectors in Ukraine.² It should be noted that the Orbis database has information on only 371 firms with state ownership as of 2016 (down from the peak of 4,867 in 1997 due to privatization, closure and mergers). I use two-digit NACE codes to classify nonfinancial firms into 84 industries, excluding public administration and

¹ The sectors are based on the statistical classifications of economic activities according to *the Nomenclature des Activités Économiques dans la Communauté Européenne* (NACE), and firms that do not report a NACE code are excluded from the sample used in this analysis.

² According to the Commercial Code of Ukraine, any enterprise in which the state holds an interest over 50 percent or can exercise ultimate influence over its operations is classified as an SOE.

defense, activities of extraterritorial organizations and bodies, and activities of households as employers and for own use. This allows a granular identification of SOEs across the Ukrainian economy, revealing substantial heterogeneity in the SOE density in terms of employment and revenues. For brevity, these industries are grouped into 11 major sectors and presented in Table 1. Most of Ukraine's SOEs operate in utilities and account for about 15 percent of all firms in the sample, followed by mining with 4 percent and professional and administrative services with 2 percent. The number of SOEs, however, does not capture the full extent of SOE dominance in a given sector. Looking at the SOE density as measured by the share in employment and revenues, I observe that a small number of SOEs have an overwhelming presence in some industries of the economy. For example, while SOEs comprise 1.7 percent of the number of firms in transportation and storage, they account for 46.5 percent of employment and 38.5 percent of revenues in that sector.

Table 2. Summary Statistics

Variables	Obs.	Mean	Std Dev	Min	Max
<i>Full Sample</i>					
Investment	1,503,815	0.25	1.24	0.00	205.92
Age	2,675,121	6.17	5.25	0.00	100.00
Total assets [log]	2,691,164	9.71	2.95	1.39	29.13
Profitability	1,912,932	-0.59	1.35	-40.46	11.39
Leverage	2,664,261	0.25	0.10	0.00	1.74
Market concentration	2,926,520	0.56	0.12	0.00	1.00
SOE density					
Employment	1,422,473	9.93	16.77	0.01	97.19
Revenue	1,422,473	7.73	14.70	0.00	89.55
<i>Manufacturing</i>					
Investment	187,018	0.26	1.21	0.00	76.32
Age	346,426	6.81	7.52	0.00	100.00
Total assets [log]	338,033	10.11	2.99	1.39	22.07
Profitability	241,631	-0.02	1.13	-39.94	11.33
Leverage	334,923	0.03	0.12	0.00	1.01
Market concentration	365,166	0.10	0.13	0.00	1.00
SOE density					
Employment	150,776	8.64	8.30	0.13	46.35
Revenue	150,776	4.45	4.83	0.03	32.71

Source: Orbis, author's calculations.

Descriptive statistics, presented in Table 2, indicate large variations across industries over the period spanning from 1997 to 2016. The dependent variable is private firms' net fixed investment scaled by total assets at the beginning of the year.³ The main explanatory variable of interest is the density of SOEs as measured by the share in employment and revenues in a given industry. To

³ Net fixed investment is measured by the difference between tangible assets in the current period, and those in the previous period.

capture firm-specific characteristics, the following variables are included: age (measured as the log number of years since establishment), size (measured as the log of total assets), profitability (return on assets measured by the ratio of profits after tax to total assets), and leverage (defined as short-term and long-term debts over total assets) to measure a firm's overall indebtedness. There are large variations in the investment ratio and firm characteristics used in the analysis, such as age, total assets, profitability, and indebtedness, across sectors and type of firms.

III. ECONOMETRIC METHODOLOGY

The empirical objective of this study is to conduct a firm-level investigation of whether SOEs crowd out private fixed investment. In this context, the main variable of interest is the share of SOEs in a given sector of the economy, and its impact is estimated on fixed investment spending by private nonfinancial companies according to the following static specification:

$$\left(\frac{I}{K}\right)_{ist} = \beta_1 SOE_{st} + \beta_2 Firm_{ist-1} + \eta_i + \eta_{st} + \varepsilon_{ist} \quad (1)$$

in which the subscripts i , s , and t denote private firm, sector, and time, respectively. The dependent variable, I/K , denotes the ratio of net fixed investment in a given year to total assets at the beginning of the year.⁴ SOE stands for the concentration of SOEs in a given sector, which is measured by the share in employment or revenues. The term $Firm$ is a vector of company-specific control variables, including age, total assets, profitability, and leverage. To capture potential persistence in private fixed investment spending, lagged dependent variable is introduced, resulting in the dynamic version of the model:

$$\left(\frac{I}{K}\right)_{ist} = \beta_1 \left(\frac{I}{K}\right)_{ist-1} + \beta_2 SOE_{st} + \beta_3 Firm_{ist-1} + \eta_i + \eta_{st} + \varepsilon_{ist} \quad (2)$$

The lagged dependent variable captures dynamic adjustments in firms' investment decisions to changes in the other variables included in the model. As in the static model, firm characteristics (age, size, profitability and leverage) and the SOE density (as measured by the share of employment and revenues in a given sector) are included. In both static and dynamic models, the η_i coefficient denotes the firm-specific fixed effects capturing time-invariant unobservable factors at the firm level. The η_{st} coefficient denotes the set of sector-year fixed effects capturing unobserved time-invariant heterogeneity among firms across sectors, and common shocks to firms belonging to the same sector in a given year. This helps control for aggregate and sectoral shocks, as well as cross-sectional dependence among firms in the sample. ε_{ist} is an idiosyncratic error term that satisfies the standard assumptions of zero mean and constant variance. Robust standard errors are clustered at the firm level to account for the fact that observations pertaining to a firm are correlated and thus do not contain as much information as unclustered errors.

⁴ Capital spending can be measured on a net or gross basis. The net investment rate is a better indicator than gross investment, as it gauges the change in a firm's stock of physical capital, excluding the fraction of capital that depreciates each year.

IV. EMPIRICAL RESULTS

The firm-level estimates show that SOEs have a crowding-out effect on private firm investment in Ukraine. I begin the analysis by first reporting the results of static estimations in Table 3 as a point of reference for the full sample and the manufacturing sector. Overall, the main determinants of fixed investment are significant and have the expected sign. The coefficients on age and size are negative and statistically significant, indicating that older and larger firms invest less than others. The financial health of firms, measured by profitability and leverage, is found to be a highly significant factor. While profitability boosts firms' investment appetite, leverage has the opposite effect on capital spending. Regarding the main variable of interest, the static estimation results present a mixed picture. The SOE concentration in a given sector (as measured by the share in employment or revenues) has a negative coefficient, but this is statistically insignificant at conventional levels. Focusing on the manufacturing sector, however, the SOE density becomes a statistically significant factor, with both measures having negative coefficient. In other words, the presence of SOEs in a manufacturing industry has a crowding-out effect on private firm investment, and the economic magnitude of this effect is greater when the concentration of SOEs is measured by the share in total revenues.

Table 3. Impact of SOEs on Private Investment—Static Estimations

	Full Sample			Manufacturing		
Age	-0.140*	-0.014**	-0.009**	-0.073***	-0.018***	-0.027**
	[0.077]	[0.006]	[0.014]	[0.016]	[0.007]	[0.011]
Size	-0.149***	-0.134***	-0.134***	-0.208***	-0.174***	-0.174***
	[0.002]	[0.004]	[0.004]	[0.008]	[0.013]	[0.013]
Profitability	0.014***	0.011***	0.011***	0.020***	0.012**	0.012**
	[0.001]	[0.001]	[0.001]	[0.004]	[0.005]	[0.005]
Leverage	-0.198***	-0.132***	-0.132***	-0.196***	-0.236***	-0.236***
	[0.018]	[0.027]	[0.027]	[0.045]	[0.083]	[0.083]
SOE density						
Employment share		-0.005			-0.068*	
		[0.020]			[0.036]	
Revenue share			-0.015			-0.104*
			[0.059]			[0.055]
Number of observations	952,597	487,166	487,166	124,128	55,142	55,142
Number of firms	335,213	216,532	216,532	42,473	25,729	25,729
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-squared	0.101	0.031	0.031	0.059	0.044	0.044

Note: Robust standard errors are clustered at the firm level and reported in brackets. A constant is included in each regression, but not shown in the table. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Dynamic specifications—capturing persistence in firm-level fixed investment over time—confirm the impact of SOEs on private firms. The dynamic model is estimated through the System Generalized Method of Moments (GMM) technique proposed by Arellano and Bover (1995) and Blundell and Bond (1998), which is appropriate given that the dataset covers a large number of firms within a short time dimension. This approach helps correct for estimation biases resulting from the inclusion of the lagged dependent variable, as well as the joint endogeneity of explanatory variables. In brief, the System GMM estimator uses internal instruments by combining variables in levels with variables in first differences, assuming that the error terms are not serially correlated and that the explanatory variables are weakly exogenous or not significantly correlated with future realizations of the error terms.⁵ As expected, the dynamic estimations, presented in Table 4, indicate significant persistence in capital spending over time. The coefficient on the lagged value of private fixed investment is positive and highly significant across all specifications of the model, which is consistent with the view that a typical fixed investment cycle tends to last multiple years. The results

Table 4. Impact of SOEs on Private Investment—Dynamic Estimations

	Full Sample			Manufacturing		
Investment t_{-1}	0.039*** [0.003]	0.037*** [0.005]	0.037*** [0.005]	0.038*** [0.006]	0.033*** [0.011]	0.033*** [0.011]
Age	-0.005*** [0.000]	-0.006*** [0.000]	-0.006*** [0.000]	-0.002*** [0.000]	-0.004*** [0.000]	-0.004*** [0.000]
Size	-0.014*** [0.001]	-0.009*** [0.001]	-0.009*** [0.001]	-0.008*** [0.001]	-0.003** [0.001]	-0.003** [0.001]
Profitability	0.004*** [0.001]	0.005*** [0.001]	0.005*** [0.001]	0.005*** [0.001]	0.007*** [0.001]	0.007*** [0.001]
Leverage	-0.008* [0.011]	-0.001* [0.013]	-0.001* [0.013]	-0.024** [0.027]	-0.068** [0.031]	-0.069** [0.031]
SOE density						
Employment share		-0.001* [0.001]			-0.001* [0.001]	
Revenue share			-0.002*** [0.001]			-0.002*** [0.001]
Number of observations	654,790	337,691	337,691	124,128	55,142	55,142
Number of firms	240,410	150,073	150,073	42,473	25,729	25,729
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
AR1 p-value	0.000	0.000	0.000	0.000	0.001	0.001
AR2 p-value	0.043	0.094	0.091	0.321	0.095	0.094

Note: Robust standard errors are clustered at the firm level and reported in brackets. A constant is included in each regression, but not shown in the table. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

⁵ The time dimension of the dataset used in this analysis is reasonably long—ranging from 1997 to 2016, but each firm in the sample has only a few observations on average. Consequently, this could weaken the instrumentation in some specifications of the dynamic model.

indicate that the inclusion of lagged fixed investment does not alter the relationships as identified with the static model, but leads to some changes in the magnitude of the estimated coefficients. Importantly, the estimations via the System GMM approach show that the SOE concentration has a statistically significant crowding-out effect on private fixed investment across all specifications.

Since not all industries are affected in the same way, the sample is split into two groups, concentrating on industries in which SOEs have a more dominant presence. This allows the analysis to exploit large differences in the concentration of SOEs across 84 nonfinancial industries in the Ukrainian economy and thereby shed a brighter light on the crowding-out effect on private firms. The focus is on industries with the share of SOEs exceeding 50 percent during the sample period, while the industries in which SOEs account for less than 10 percent are treated as a control group. The estimation results based on this approach analogous to the difference-in-differences methodology, presented in Table 5, confirm that the crowding-out effect on private firm investment is significantly greater in industries in which SOEs have a dominant position compared to industries with limited SOE presence.

Table 5. Impact of SOEs on Private Investment—High-SOE vs. Low-SOE Industries

	High-SOE Industries			Low-SOE Industries		
Age	-0.049*** [0.018]	-0.050*** [0.018]	-0.050*** [0.018]	-0.013*** [0.003]	-0.016*** [0.005]	-0.018** [0.008]
Size	-0.183*** [0.017]	-0.183*** [0.017]	-0.183*** [0.017]	-0.124*** [0.004]	-0.124*** [0.004]	-0.124*** [0.004]
Profitability	0.020*** [0.005]	0.020*** [0.005]	0.020*** [0.005]	0.010*** [0.002]	0.010*** [0.002]	0.010*** [0.002]
Leverage	-0.176* [0.144]	-0.174* [0.144]	-0.174* [0.144]	-0.111*** [0.030]	-0.111*** [0.030]	-0.111*** [0.030]
SOE density						
Employment share		-0.095** [0.044]			-0.008 [0.013]	
Revenue share			-0.077** [0.035]			-0.018 [0.031]
Number of observations	30,900	30,900	30,900	354,232	354,232	354,232
Number of firms	14,269	14,269	14,269	159,481	159,481	159,481
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-squared	0.035	0.035	0.035	0.030	0.030	0.030

Note: Robust standard errors are clustered at the firm level and reported in brackets. A constant is included in each regression, but not shown in the table. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

As a further robustness check, the analysis controls for market concentration that could lead monopolistic powers and lower fixed capital formation. To ensure the robustness of the baseline

findings, a statistical measure of market concentration in any given industry is introduced as an additional control variable to test whether SOEs still have a crowding-out effect on privately-owned companies. If there are significant barriers to entry, then firms operating in industries with a high level of market concentration—irrespective of government or private ownership—could obtain monopoly powers and crowd out other firms' fixed investment spending. Market concentration is proxied by the Herfindahl-Hirschman Index (HHI) at the two-digit industry level:

$$HHI = \sum_{i=1}^N s_i^2$$

in which s_i is the market share of a firm in a given industry and N is the total number of firms in that industry. The HHI is one of the most commonly used measures of market concentration in the literature, accounting for heterogeneity in the size of firms and giving more weight to larger companies. The estimation results including the HHI as a control variable, presented in Table 6, are in line with the baseline findings. High degree of market concentration appears to have a dampening effect on fixed investment spending among private firms, but this is not statistically significant at conventional levels. Importantly, however, the inclusion of market concentration does not alter the impact of SOEs on private firms' investment behavior, especially in the manufacturing sector.

Table 6. Impact of SOEs on Private Investment—Including Market Concentration

	Full Sample		Manufacturing	
Age	-0.023*** [0.009]	-0.053* [0.031]	-0.018*** [0.007]	-0.026*** [0.010]
Size	-0.134*** [0.004]	-0.134*** [0.004]	-0.174*** [0.013]	-0.174*** [0.013]
Profitability	0.011*** [0.001]	0.011*** [0.001]	0.012** [0.005]	0.012** [0.005]
Leverage	-0.132*** [0.027]	-0.132*** [0.027]	-0.236*** [0.083]	-0.236*** [0.083]
Market concentration	-1.059 [1.086]	-2.046 [1.570]	-0.085 [0.055]	-0.362 [0.268]
SOE density				
Employment share	-0.038 [0.029]		-0.068* [0.036]	
Revenue share		-0.180 [0.135]		-0.102* [0.053]
Number of observations	487,166	487,166	55,142	55,142
Number of firms	216,532	216,532	25,729	25,729
Firm FE	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Adj R-squared	0.031	0.031	0.044	0.044

Note: Robust standard errors are clustered at the firm level and reported in brackets. A constant is included in each regression, but not shown in the table. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

V. CONCLUDING REMARKS

There has been much debate on whether government spending crowds out or crowds in the private sector, but few studies have provided firm-level evidence. The economic impact of government spending on the private sector is a particularly contentious issue in transition countries like Ukraine where the state continues to have a dominant role in the economy. Even after decades of privatization and market liberalization, SOEs still have a sizable presence in Ukraine's economic landscape in terms of employment and output and so their performance is central for the efficient functioning of the broader economy. This paper is the first attempt to estimate the crowding-out impact of SOEs on private fixed investment at the firm level in Ukraine, instead of country-level analysis that tends to conceal substantial heterogeneity across firms and sectors.

This paper provides firm-level evidence indicating that SOEs crowd out fixed investment spending by private firms. Using a large-scale dataset on 665,391 firms in 84 nonfinancial industries over the period 1997–2016, this paper finds that the SOE concentration in given sector—measured by the share in employment or revenues—has a statistically significant adverse effect on private fixed investment at the firm level. The impact of SOEs is stronger in the manufacturing sector and in those industries in which SOEs have a more dominant presence. This implies that private firms operating in sectors with a high level of SOE concentration invest systematically less than businesses that are not competing directly with SOEs. Furthermore, the empirical results are likely to underestimate the full extent of the crowding-out effect of SOEs on private companies, since the firm-level dataset used in this paper covers only about 20 percent of SOEs currently operating in Ukraine.

SOEs are important stakeholders in the Ukrainian economy, but ensuring a level playing field with private firms is necessary for allocative efficiency in the broader economy. There is ample evidence that privatization brings gains in economic efficiency in transition economies by stimulating private sector development, attracting foreign investment, and fostering competition across the economy (Megginson and Netter, 2001; Estrin and others, 2009; Estrin and Pelletier, 2018). In the case of Ukraine, Brown and Earle (2004) and Grygorenko and Lutz (2007) find that privatization has a positive effect on productivity, sales and profitability. While SOEs could be useful in achieving certain policy objectives when there is an unambiguous market failure, most SOEs in Ukraine—marred by weak corporate governance and saddled with substantial financial losses—struggle to meet the private sector's performance levels and weigh on the overall performance of the economy. Therefore, corporate governance reforms would not only help minimize the crowding-out effect of SOEs on private firms documented in this paper, but also significant risks to public finances imposed by SOEs directly through subsidies and indirectly through contingent liabilities.⁶

⁶ Böwer (2017) provides an overview of macro-fiscal risks associated with weak performance of SOEs and best practices in SOE governance.

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