Competition, Entry, and Firm Dynamics in Public Procurement

Marly Tatiana Celis Galvez*†

November 10, 2026
Job Market Paper

Abstract

This paper studies how entry into public procurement markets affects firms' financial performance. I implement an event-study design that exploits variation in entry timing by assembling a firm-year panel that combines administrative Dutch public procurement contract data with firm-level balance sheet information. I estimate dynamic post-entry changes for general entry events (first contract) and competitive entry events (first contract in an open tender with more than two competitors). General entry is associated with asset growth and higher liabilities, while liquidity declines. In contrast, gains from competitive entry are weaker and less persistent. Firm heterogeneity analysis suggests that established firms sustain improvements, capacity-constrained firms display limited persistence, and short-term participants experience only temporary gains. I discuss two mechanisms. First, short-term participants engage in aggressive underbidding consistent with winner's-curse dynamics and learning-by-doing. Second, entrants sort into tenders with fewer bidders, suggesting information frictions. The results suggest that firm's capabilities may play a role in leveraging public demand into firm growth.

Keywords: Procurement, Firm Entry, Firm Behavior
JEL: H57, D44, L25, C23, D22

*Email: marly.celis@maastrichtuniversity.nl

†I gratefully acknowledge ProRail for providing access to the administrative procurement data used in this study. I thank the representatives of ProRail for their time and for clarifying institutional details throughout the research process. The views expressed in this paper are solely those of the author and do not necessarily reflect the views or official position of ProRail.

1 Introduction

Public procurement is an important source of demand for firms. Around 16% of GDP of European Union members is spent on the purchase of services, works, and supplies (European Commission, 2025), indicating an important link between public demand and private supply. These markets are important for firms, especially when public contracts provide access to large buyers, repeated business opportunities, and reputational signals that may affect future growth. Understanding how firms respond when they first enter procurement markets is central to evaluating whether public demand translates into firm expansion. However, public procurement markets have become less competitive over the past decade, as measured by a decline in the average number of bids submitted per tender. By 2024, the average number of bids for a tender was 3.2, two fewer bids than a decade earlier (ECA, 2023). This declining trend in participation is particularly puzzling in light of a growing strand of empirical evidence documenting that firms benefit from winning public procurement contracts, such as increased productivity (Chiappinelli et al., 2025; Ferraz et al., 2015), access to credit (di Giovanni et al., 2024), and sales (Hoekman et al., 2024). Additionally, public entities and international agencies promote public procurement as a channel through which governments can achieve innovation, green growth, and societal goals (OECD, 2025b; World Bank, 2025; Mazzucato et al., 2025).

This paper examines how entry into public procurement markets is associated with firms' financial performance, and whether changes depend on how firms enter. I define entry as the first public contract awarded to a firm, and distinguish between **general entry** and **competitive entry**, where the latter is restricted to open tenders with more than two bidders. This distinction allows me to isolate differences in outcomes across procurement environments that vary in competitive intensity. Existing literature focuses on firm growth and the effects of winning public contracts (Hebous and Zimmermann, 2021; Gugler et al., 2015; Srhoj and Dragojević, 2024; Fadic, 2020; di Giovanni et al., 2024), but discuss little about the type of entry or treat it as a homogeneous event and abstracts from the competitive environment in which contracts are awarded. The auction literature provides detailed analyses of bidding behavior and entry in procurement settings primarily within first-price auction frameworks (Krasnokutskaya and Seim, 2011; De Silva et al., 2009) but focuses on equilibrium behavior rather than post-award firm performance. By distinguishing between general and competitive entry, this paper bridges these literatures: it brings variation in competitive conditions, central to auction models, into the analysis of firm-level outcomes following procurement entry. The distinction is empirically relevant given the documented decline in the average number of bidders in public procurement markets, and it provides a

framework to better understand how market structure relates to firm outcomes at entry.

Answering this question is challenging because firms do not enter procurement markets randomly. Firms that win public contracts may differ from non-suppliers in age, size, sector, capabilities, financial conditions, and expected growth even before entry. These differences make simple comparisons between suppliers and non-suppliers difficult to interpret. A credible empirical strategy must therefore construct a comparison group that approximates the counterfactual financial path entrants would have followed had they not entered the procurement market.

A second challenge is that procurement entry occurs in a staggered fashion. Firms win their first public contract in different years, while many firms never enter during the sample period. In this setting, standard two-way fixed effects event-study estimators can be sensitive to treatment-effect heterogeneity across cohorts and over time since entry. Already-treated firms may implicitly serve as controls for newly treated firms, generating contaminated comparisons and non-transparent weights (Goodman-Bacon, 2021). This concern is especially relevant in procurement markets, where the effects of entry are likely to differ between firms entering through competitive procedures and firms entering through other procurement routes.

This paper studies entry into Dutch public procurement markets above the European procurement thresholds between 2016 and 2024[1]. I define entry as the first time a firm is awarded a public procurement contract above these thresholds. I combine contract-level procurement data with firm-level balance sheet information and estimate dynamic effects around entry using a staggered difference-in-differences design. The main comparison group consists of matched firms that never become public suppliers during the sample period.

The empirical framework treats procurement entry as a persistent state rather than a one-time transaction. Once a firm wins its first public contract, it may accumulate procurement-specific experience, learn how to bid, gain market access, and remain engaged in contract delivery. I therefore consider firms treated after their first contract, even if they do not immediately win another one. This interpretation is consistent with models of procurement participation in which firms become potential suppliers after incurring entry and learning costs (Athey et al., 2013; De Silva and Rosa, 2025).

The main identifying assumption is conditional parallel trends. Conditional on pre-entry observables, including firm age, firm size, and sector, entrants and comparable non-entrants are assumed to have followed similar trends in financial outcomes absent entry. This assumption allows for selection into procurement based on observed characteristics and time-

[1]According to the OECD public procurement spending accounted for 20% of the Dutch GDP in 2022 (OECD, 2025a), positioning the Netherlands on the right tail of this distribution.

invariant differences, but requires that remaining differences in untreated outcome dynamics are not systematically related to the timing of entry. The estimates should therefore be interpreted as relying on a structured comparison between entrants and similar non-entrants, rather than on random assignment.

I construct the dataset from three sources. First, I use contract-level data from TenderNed, the Dutch public procurement platform, covering contracts above the European thresholds. These data identify awarded contracts, buyers, procurement procedures, contract values, number of bidders, and winning firms. Second, I merge the procurement records to firm-level financial information from Moody's Orbis, which provides balance sheet outcomes for Dutch firms over 2012–2024. Third, I use complementary bid-level data from ProRail, a large Dutch public buyer, to study bidding behavior and mechanisms.

The main outcomes capture firms' financial performance and scale. I study current ratio, solvency, shareholder funds, total assets, asset growth, liabilities, liability growth, number of employees, and employment growth. The final event-study sample contains 4,235 general entry events, of which 1,095 correspond to competitive entry. Entry contracts are smaller than the average contract in the full procurement data but attract relatively similar number of bidders, suggesting that entry occurs in procurement environments where competition is meaningful.

To take the model to the data, I implement the group-time difference-in-differences estimator of Callaway and Sant'Anna (2021). Firms are grouped into cohorts based on the year in which they first enter the procurement market. I first estimate cohort-specific treatment effects for each entry cohort and calendar year, comparing entrants to matched never-supplier firms. I then aggregate these group-time effects by relative event time to obtain dynamic event-study estimates. This approach avoids using already-treated firms as controls and allows treatment effects to vary across cohorts and over time since entry.

I address selection into procurement in two ways. First, I construct a matched comparison group of never-supplier firms using pre-entry firm characteristics, including age, sector, and size. Second, I estimate robustness specifications using not-yet-supplier firms as the comparison group, excluding never suppliers. This alternative comparison relies only on variation in entry timing among firms that eventually become suppliers. I also examine heterogeneity by classifying entrants as short-term participants, capacity-constrained firms, and established firms, and I use bid-level data to study whether differences in bidding behavior help explain the results.

I document that entry into public procurement, when defined broadly, is associated with improvements in firms' financial indicators. In particular, I find patterns consistent with increases in asset accumulation and liabilities, which align with interpretations in the literature

linking procurement participation to improved access to credit and firm expansion. However, when focusing on competitive entry, the observed gains appear less persistent. Increases in assets are concentrated around the year of entry and attenuate thereafter.

The main results show that procurement entry is associated primarily with balance-sheet adjustments. General entry is followed by a decline in liquidity, measured by the current ratio, and by a substantial increase in liabilities. Overall liabilities rise by about EUR 97,975 after general entry, with liability growth increasing by 22.3%. Competitive entry is also associated with higher liabilities, but the effects are smaller: liabilities increase by about EUR 71,887, with liability growth of 13.5%. These patterns suggest that entry is associated with greater financial obligations and weaker short-term liquidity.

The evidence on firm expansion is more mixed. General entry is associated with statistically significant asset growth of about 9.9%, while the effect on total assets in levels is positive but not statistically significant. For competitive entry, asset growth is smaller, about 2.5%, and not statistically significant. Employment effects are limited across both entry definitions. The results therefore suggest that entry into procurement markets does not uniformly generate broad-based firm growth. Instead, public procurement entry appears to reshape balance sheets, especially through higher liabilities, while sustained growth in assets and employment is concentrated among specific types of firms.

This pattern is consistent with evidence from experimental and quasi-experimental settings suggesting that competitive environments may limit the persistence of gains from initial contract awards. My contribution lies in showing that, in observational data, entry through more competitive channels is systematically associated with weaker and less sustained financial improvements.

A potential concern is that these patterns may reflect selection on observable or unobservable firm characteristics. To further investigate heterogeneity in post-entry trajectories. Firms typically remain active a couple of years following entry, as contracts take on average 36 months to complete. This institutional feature implies that post-entry differences are not driven by short-run market exit, but rather by heterogeneity in firms' ability to obtain additional contracts over time. I classify firms based on their subsequent participation patterns: established firms, which consistently win contracts after entry; capacity constrained firms, which participate intermittently; and short-term participants, which do not win additional contracts beyond entry. This classification reveals systematic differences.

Established firms exhibit positive changes in assets following entry, although these effects are attenuated in competitive entry settings. Capacity-constrained firms display similar, albeit weaker, patterns. In contrast, short-term participants experience only temporary improvements under general entry, which are not evident under competitive entry. These

findings suggest that observable firm characteristics, such as size and capacity, play an important role in shaping post-entry outcomes. At the same time, the attenuation of effects under competitive entry is observed across all firm types, indicating that competitive entry environments may pose challenges even for relatively stronger firms, potentially due to higher adjustment, transaction, or information costs.

Finally, I explore mechanisms that may rationalize these patterns. I present evidence consistent with entrants engaging in aggressive bidding strategies, including underbidding, which may expose them to outcomes resembling a winner's curse, particularly among short-term participants. At the same time, the patterns for established firms are consistent with a process of learning-by-doing following entry. I also document that short-term participants tend to enter contracts with lower observed levels of competition. Observable contract characteristics do not provide clear evidence that these contracts are systematically less attractive, more complex, or riskier. This suggests that unobserved contract attributes or informational advantages of incumbents may play a role in shaping entry outcomes.

Overall, the paper contributes to the literature by highlighting the importance of distinguishing between entry environments and by documenting that entry through more competitive procurement channels is associated with weaker and less persistent financial improvements, even after accounting for firm heterogeneity. These findings suggest that entry alone is insufficient: firms' ability to bid, execute contracts, and remain active is central to whether public demand supports growth.

This paper also carries policy implications. This paper highlights that in public procurement markets, entry and permanence is central to the competition outcomes. The implications of these results is informative to public entities and international agencies who promote public procurement as a channel through which governments can achieve innovation, green growth, and societal goals (OECD, 2025b; World Bank, 2025). Furthermore, studying competition in public procurement markets provides evidence to enlighten salient discussions on European competitiveness (Draghi, 2024).

This paper contributes to three strands of literature. First, I speak to a growing literature that exploits public procurement as a source of exogenous demand shocks to study firms' growth, labor demand, and financial outcomes. The literature shows that winning a public procurement contract positively affects firms' performance (Hebous and Zimmermann, 2021; Hoekman et al., 2024; di Giovanni et al., 2024; Pantea and Laurentsyeva, 2026; Czarnitzki et al., 2020). However, there is substantial heterogeneity in persistence. While some studies find only short-run effects on employment (Gugler et al., 2015; Srhoj and Dragojević, 2024; Fadic, 2020), others document long-run growth (Ferraz et al., 2015; di Giovanni et al., 2024; Lee, 2021). However, the existing literature has paid little attention to the competitive

mechanism firms face when winning. My paper contributes by focusing on how competitive mechanisms in public procurement markets may shape these growth trajectories, an aspect absent in this strand of literature.

Second, the firm heterogeneity exploration contributes to a larger literature that examines the role of demand shocks in determining firms dynamics (Foster et al., 2016, 2008) and how firms approach new markets (Alfaro-Urena et al., 2022; Amiti et al., 2024). In the context of public procurement, a few papers have studied heterogeneity as such Hebous and Zimmermann (2021); constrained versus constraints, Ferraz et al. (2015) by small versus big; and Hoekman et al. (2024) by regular versus irregular status. My findings move the empirical literature forward by showing that entry into a public procurement market improves firm outcomes on average, but these gains are not driven by competitive entry and are concentrated among firms that remain active and have the capacity to scale.

Third, my findings that small firms underbid and participate in tenders with fewer competitors speaks to the literature that studies the trade-off between price competition in public procurement (Carril et al., 2026; De Silva and Rosa, 2025; Jääskeläinen et al., 2026; Titl, 2025). My paper contributes by documenting that competitive pressures influence participation and bidding behavior, and that these, in turn, determine the allocation and impact of demand shocks.

The rest of the paper is presented as follows. Section 2 describes the institutional setting and data sources. Section 3 presents the empirical framework and identification assumptions. Section 4 presents the main results, including the staggered entry patterns, the event-study estimates for general and competitive entry, and the firm heterogeneity analysis. Section 5 explores the mechanisms underlying the main findings, focusing on underbidding behavior and sorting into less competitive procurement environments. Section 6 discusses limitations and directions for future research. Section 7 concludes.

2 Institutional Setting

Public procurement is a key market for the Dutch economy. The Netherlands ranks among the largest public buyers in the OECD, with procurement accounting for 20.9% of GDP compared to an OECD average of 12.9% in 2021 (OECD, 2025a). The institutional setting is characterized by a decentralized governance structure in which provinces, municipalities, and regional water authorities have substantial autonomy over their procurement decisions[2].

The regulatory framework of the procurement market is defined by the Public Procure-

[2]The decentralized public bodies consist of: 12 provinces, 355 municipalities, and 21 regional water authorities. Other semi-public organizations, such as educational organizations, are also considered contracting authorities when purchasing works, goods, and services (EZK, 2021)

ment Act 2012 *Aanbestedingswet 2012* that establishes rules aimed at ensuring fair competition, transparency, and objectivity. This framework applies to contracts above and below the European procurement thresholds. An important amendment occurred on 1 July 2016, when the European Union procurement directives 2014/24/EU and 2014/25/EU were transposed to the Dutch Act. These directives introduced two changes for contracts above the European thresholds: (i) mandatory electronic tendering and (ii) use of the most economically advantageous tender criteria, which is an umbrella term for lowest price, best price-quality ratio, and lowest cost criteria.

This paper focuses on Dutch public procurement above EU thresholds over the period 2016-2024[3]. Since the transposition of the EU procurement directives in 2016, this segment operates within a stable and harmonized regulatory framework. In this context, 2016 represents a shift in the entry margin by increasing the probability that potential suppliers become aware of tender opportunities, increasing expected returns to participation. By focusing on this segment, the analysis can capture the dynamics of entry and competition in a setting where information frictions are reduced and participation is likely to emerge.

2.1 Data sources

I construct a panel dataset of Dutch firms with balance sheet information and the year of entry in the European public procurement market. I use two primary data sources to build this dataset. First, TenderNed, which includes tenders above the European procurement thresholds between 2016 and 2024. This dataset provides a contract-level panel that links awarded tenders with winning firms. Second, I use firm-level financial information from Orbis Moody's, a global database of company financials covering 2012 to 2024. Additionally, I use a complementary dataset from ProRail, a large public buyer, to study bid-level behavior.

Procurement data and definition of entry. The main source of procurement data is TenderNed, a Dutch national platform that publishes public procurement contracts above the European thresholds[4]. The data cover the period 2016–2024 and provide contract-level information on procurement procedures, including the identity of the winning firm, the

[3]The thresholds for public contracts are defined by type of procurement; for instance, the threshold for public works contracts is EUR 5,350,000, for public supply and service contracts is EUR 214,000, and for public supply and service contracts awarded by central government authorities is EUR 428,000. Section 2, article 4 of the European Directives 2014/24/EU define the thresholds with value net of value-added tax Single Market Europa Web. The thresholds described here are remained unchanged for the period covered in the analysis. I use the threshold amount to impute missing contract values (see appendix A.3)

[4]TenderNed publishes procurement tender notices and tender awards above the EU thresholds for the Netherlands and provides comprehensive coverage of large public contracts. Existing estimates indicate that these procedures account for about 29.2% of Dutch public procurement. In 2023, EUR 33.9 billion in tenders out of EUR 116.2 billion of estimated total (Team Significant Synergy, 2024).

number of bidders, the procurement method, and contract characteristics. In the appendix A, I provide a detailed description of the data cleaning process, which includes recovering misreported information on the price and number of bids, as well as text similarity checks to ensure accurate matching of winning firms to their financial data in Orbis.

I use these data to define firm entry into the public procurement market. A firm enters when it is first observed winning a contract above the European thresholds. I distinguish between two definitions of entry. **General entry** is defined as the first year in which a firm wins any contract above the threshold. **Competitive entry** restricts attention to contracts awarded through open procedures with at least two bidders, capturing entry into contested procurement markets. General entry reflects access to public procurement, and competitive entry isolates entry into contracts where competition forces are more likely to shape outcomes.

Firm-level data and panel construction. To study firm outcomes around entry, I merge the procurement data with firm-level financial information from Orbis (Moody's Analytics). Orbis provides annual balance sheet data for a large population of Dutch firms over the period 2012–2024. The merged dataset is structured as a firm-year panel. This allows me to track firms both before and after entry into procurement markets, as well as to compare entrants to firms that never supply to the government. The availability of a large firm-level database is important in this context, as it enables the identification of a comparison group of non-supplier firms.

For each firm-year, I construct a set of nine financial outcomes capturing firm performance and scale, including measures of assets, liabilities, and employment, as well as their growth rates. These variables allow me to study how entry into procurement markets is associated with changes in firm dynamics. The raw dataset includes roughly 1.3 million firms per year in the Netherlands. Of these, around 10,000 firms are matched to the procurement data and form the main analysis sample, where I measure financial performance and firm characteristics including total assets, liabilities, shareholder funds, and employment, as well as their growth rates.

The estimation sample is constructed by linking the original matched panel dataset to the samples effectively used in the event studies estimations. For each specification, outcome variable, and estimation type (never-treated and not-yet-treated), I retrieve the subset of observations retained in the estimation procedure and create indicator variables that flag whether a given firm-year observation is included in the corresponding estimation sample. This is done for all specifications (general and competitive events samples, as well as firms heterogeneity subsamples) and for all outcome variables. The resulting dataset combines

these indicators with the original panel, allowing to track sample composition across specifications and ensure consistency in the empirical analysis.

Complementary bid-level data. To complement the contract-level analysis, I use separate sample of bidding data from a large Dutch public buyer. This dataset contains information on submitted bids, participating firms, and procurement outcomes over the period 2012–2024. The bid-level data provide a more granular view of firm behavior, allowing me to analyze participation decisions and competitive dynamics directly. While this dataset covers a subset of the procurement market, it is particularly useful for understanding the mechanisms underlying entry and competition.

Table 1. Descriptive statistics

	Panel A: General Entry Events				Panel B: Competitive General Entry Events					
Variable	Mean	Median	Std.Dev.	N	Mean	Median	Std.Dev.	N	Diff.	p-value
Contracts characteristics										
Number of bids	4.230	3.000	4.270	4,121	4.860	4.000	3.740	1,095	-0.640	0.000
Duration in months	36	24	42	1,040	35	24	31	432	1	0.450
Contract value	1,161	750	3,555	4,102	1,144	509	3,713	1,073	17	0.890
Services	0.720	1.000	0.450	4,235	0.690	1.000	0.460	1,095	0.030	0.090
Supplies	0.220	0.000	0.410	4,235	0.220	0.000	0.410	1,095	0.000	0.960
Works	0.060	0.000	0.240	4,235	0.090	0.000	0.290	1,095	-0.030	0.000
Firms' balance sheet information										
Current ratio	2.5	1.5	5.0	2,751	2.5	1.5	5.6	836	0.0	0.957
Solvency ratio	37.4	38.2	31.8	2,706	35.6	36.3	31.1	821	1.8	0.153
Shareholder funds	520,057	263,243	778,368	2,761	529,019	267,356	781,466	842	-8,962	0.771
Assets	1,444,288	822,338	1,669,443	2,763	1,560,260	918,630	1,787,774	837	-115,973	0.095
Log assets	13.4	13.6	1.6	2,792	13.5	13.7	1.7	849	0.0	0.449
Employees	18.6	13.0	18.4	1,736	20.0	13.5	19.8	532	-1.4	0.145
Log employees	2.4	2.6	1.2	1,736	2.5	2.6	1.1	532	-0.1	0.141
Liabilities	774,315	440,876	862,105	2,668	821,810	511,367	848,691	802	-47,494	0.166
Log liabilities	12.8	13.0	1.5	2,662	13.0	13.1	1.4	801	-0.2	0.004
Subsample bids information										
Relative bid					1.08	1.02	0.35	6,697		
Number of bids					3.90	4.00	1.56	6,716		
Duration in months					16.40	13.10	12.67	4,972		
Lowest Price					0.85	1.00	0.35	6,716		

Notes: The table is divided in three parts. The top part corresponds to characteristics of contracts including number of bids, duration of the contract, imputed contract value, and type of tender. The sample of contracts is restricted to entry events, Panel A for general events and Panel B for competitive events. For reference, table A1 shows the descriptive of all tenders. The middle part presents statistics of financial data in baseline 2016. The bottom part presents statistics of the subsample of bids from ProRail, including the relative bid, the number of bidders, and the type of procurement procedure.

Descriptive statistics. Table 1 reports descriptive statistics for entry events. The sample is restricted to contracts that constitute the entry event for firms in the estimation sample, excluding subsequent contracts and contracts awarded to other firms. The sample comprises 4,235 entry events of which 1,095 correspond to competitive entry. The average contract value at entry is EUR 1.16 million, with a standard deviation of EUR 3.5 million, indicating substantial variation in contract size. The average number of bidders for entry contracts is around 4.2 in general entry events, with competitive entry contracts having a higher average

number of bidders of 4.9. Contract duration averages approximately three years and does not differ meaningfully between general and competitive entry. In terms of composition, the majority of entry contracts are for services (60%), followed by works (30%) and supplies (10%). Compared to the full sample of contracts (Table A1), entry contracts are smaller on average (EUR 1.16 million versus EUR 1.8 million) but exhibit a similar distribution across contract types and procurement methods. However, entry contracts attract more bidders, suggesting that firms face relatively stronger competitive pressure when entering the procurement market.

Table 1 presents summary statistics for the main financial variables used in the analysis. Firms entering public procurement markets are relatively large and financially stable. For instance, the average firm has assets of about EUR 1.6 million and employs around 20 workers. Differences between general entry and competitive entry are small, although firms entering competitive procedures tend to be slightly larger and more leveraged.

3 Empirical framework

To estimate changes in firm financial performance post-market entry, I adopt an event study framework. I define entry as the first time a firm is awarded a public procurement contract above the European public procurement thresholds, which marks the firm's initial participation as a supplier in the public procurement market. This design aligns with similar approaches in the procurement literature that study the effects of demand shocks on firms' growth and financial performance (Hebous and Zimmermann, 2021; Pantea and Laurentsyeva, 2026; Lee, 2021) and in the literature of market entry (Alfaro-Urena et al., 2022; Amiti et al., 2024). Firm entry into the public procurement market occurs in a staggered fashion. This means that not all firms supply to the government and that those who are suppliers do not become suppliers in the same year.

A canonical specification is given by equation 1[5], where $D_{i,t-j}$ is an indicator variable for event time j, with $j = 0$ denoting the year of entry (i.e., the first contract awarded).

$$y_{it} = \sum_{\substack{j=-m \\ j\neq -1}}^{n} \gamma_j \cdot D_{i,t-j} + \alpha_i + \delta_t + \epsilon_{it} \tag{1}$$

Using terminology from Difference-in-Differences, the treatment indicator D is defined as a firm's first win as a supplier to the government. This is a discrete event: once a firm wins its

[5]The specification in equation 1 represents the Two-Way Fixed Effects model following notation from Miller (2023), which is the same discussed in Freyaldenhoven et al. (2021), Sun and Abraham (2021), and Goodman-Bacon (2021), among others.

first contract, it is considered treated in all subsequent periods[6]. The specification includes firm fixed effects α_i that control for time-invariant firm characteristics, time fixed effects δ_t to absorb common yearly economic shocks, and sets $\gamma_{-1} = 0$ as a restriction condition. The parameter γ_j captures the changes in outcomes after entry relative to the year before entering.

Identification in this framework exploits the staggered timing of entry. Each year, a new cohort of firms enters the procurement market, while other firms have not yet entered or never enter during the sample period. However, when treatment effects are heterogeneous across cohorts or over time since entry, the standard two-way fixed-effects estimator may produce biased estimates. In particular, already-treated firms may serve as controls for newly treated firms, leading to contamination and negative weighting of treatment effects (Goodman-Bacon, 2021). Unfortunately, the more treatment effect heterogeneity, i.e. variation in treatment timing or multiple time periods, the more sensitivity to weighting schemes. These issues have been extensively discussed in the recent Difference-in-Differences literature with different estimators proposed. For instance, Sun and Abraham (2021) and Wooldridge (2025) suggest regression-based approaches; Borusyak et al. (2024) develop an imputation method of untreated potential outcomes, Dube et al. (2025) suggest a stacked two-way effects regression, and (Callaway and Sant'Anna, 2021) who propose estimations at the group level and is robust to covariates.

To address these concerns, I follow Callaway and Sant'Anna (2021) in two steps. First, I estimate group-time average treatment effects. Second, I aggregate these effects by relative event time. In the first step, firms are grouped into cohorts according to their year of entry into the public procurement market, denoted by g. For each entry cohort g and calendar year t, the group-time average treatment effect is defined as

$$\widehat{\gamma}(g,t) = \mathbb{E}\left[Y_t(g) - Y_t(0) \mid G = g\right] \tag{2}$$

where $Y_t(g)$ is the potential outcome at time t for firms first treated in year g, $Y_t(0)$ is the untreated potential outcome, and $G = g$ denotes membership in entry cohort g. Equation 2 is the cohort-specific treatment effect in calendar time. Since $Y_t(0)$ is not observed for treated firms after entry, identification requires a comparison group that approximates the untreated outcome path for firms in cohort g.

I use firms that never become suppliers in the public procurement market as the comparison group. These never-supplier firms are drawn from the pre-matched sample described in Section C, ensuring that they are sufficiently comparable to entrant firms. Let $C_i = 1$ indi-

[6] I do not use a continuous measure of treatment intensity (e.g., procurement revenues), as these variables are poorly recorded in the data (see the appendix).

cate that firm i never enters the public procurement market during the sample period and that are similar enough to entrants. I estimate equation 2 using the doubly robust estimator of Callaway and Sant'Anna (2021), conditioning on a covariate vector X_i that includes sector and pre-entry firm size. Under no anticipation, the estimator is

$$\widehat{\gamma}^{CS}(g,t) = \mathbb{E}_n\left[\left(\widehat{w}_g^{entry} - \widehat{w}_g^{never}\right)\left(Y_{it} - Y_{i,g-1} - \widehat{m}_{g,t}^{never}(X_i)\right)\right] \tag{3}$$

where the treatment and comparison weights are

$$\widehat{w}_g^{entry} = \frac{\mathbf{1}\{G_i = g\}}{\mathbb{E}_n[\mathbf{1}\{G_i = g\}]}, \qquad \widehat{w}_g^{never} = \frac{\dfrac{\widehat{p}_g(X_i)C_i}{1-\widehat{p}_g(X_i)}}{\mathbb{E}_n\left[\dfrac{\widehat{p}_g(X_i)C_i}{1-\widehat{p}_g(X_i)}\right]}. \tag{4}$$

In equation 4, $\widehat{p}_g(X_i)$ is the estimated generalized propensity score for belonging to entry cohort g, rather than to the never supplier group, conditional on sector and pre-entry firm size. The term $\widehat{m}_{g,t}^{nev}(X_i)$ in equation 3 is the estimated outcome-regression component for firms that are never suppliers, defined as the conditional expectation of $Y_{it} - Y_{i,g-1}$ given X_i among never supplier firms.

In the second step, I aggregate the estimated group-time effects by relative event time $e = t - g$. This produces event-study estimates that summarize how financial performance changes e years after entry into the procurement market. Following Callaway and Sant'Anna (2021), the event-time aggregation is

$$\widehat{\gamma}_e^{CS} \equiv \widehat{\theta}_{es}(e) = \sum_{g\in\mathcal{G}} \mathbf{1}\{g + e \leq T\}\widehat{P}(G = g \mid G + e \leq T)\widehat{\mathrm{ATT}}_{dr}^{nev}(g, g+e) \tag{5}$$

Equation 5 averages the group-time effects in equation 3 across all cohorts observed e years after entry, weighting cohorts by their relative size among the cohorts observed at that event time. The resulting parameter, $\widehat{\gamma}_e^{CS}$, is the Callaway-Sant'Anna analogue of the event-study coefficient γ_j in equation 1. It traces the dynamic effect of becoming a public procurement supplier while allowing entry effects to vary across cohorts and over time since entry.

For robustness, I also estimate specifications that use not-yet-supplier firms as the comparison group. In these exercises, the structure of equation 3 remains largely the same, but the comparison group is restricted to firms that have not yet entered the public procurement market by calendar year t. The not-yet-supplier robustness specifications are estimated without covariates. These estimations exclude never-supplier firms, so identification comes from variation in treatment timing among firms that eventually become suppliers. This comparison group is informative because not-yet-supplier firms may share similar economic

incentives, information, and capacity with treated firms, but enter the procurement market in a different year due to variation in timing.

3.1 Assumptions

My approach relies on the conditional parallel trends assumption. In the setting of staggered entry, the interpretation of $\widehat{\gamma}^{CS}(g,t)$ depends on whether, after controlling for observed covariates, firms entering the procurement market at different times, or never entering, provide a plausible comparison group. The covariates include firm age, a size indicator (small vs. non-small), and sector fixed effects. Conditional on these characteristics, the identifying assumption is that, absent entry into the procurement market, treated and comparison firms would have followed similar trends in financial outcomes. Parallel trends can be compatible with selection into treatment when selection is based on pre-treatment information or time-invariant unobservables, as in imperfect foresight or selection on fixed effects (Ghanem et al., 2022). To make this assumption more plausible, I account for pre-entry invariant observables by implementing propensity score matching (Sekhon, 2011) and constructing a comparison group of firms with similar observable characteristics. Once these observable differences are accounted for, the remaining identifying restriction is that the evolution of untreated potential outcomes is not systematically related to the pre-treatment determinants of entry. Under these conditions, the estimates should be interpreted as relying on a structured comparison between entrants and similar non-entrants.

Staggered treatment adoption implies that once a firm participates in public procurement, it remains treated, as treatment reflects the accumulation of experience, capabilities, and market access rather than a one-time transaction. Firms that do not win a contract after they enter are still considered treated, since they continue to acquire bidding experience and may remain engaged in the delivery of previously awarded contracts, which on average take 36 months (see Table 1). This interpretation is consistent with the literature, which defines participation in procurement markets as a persistent state of potential bidders rather than a transitory event (e.g., Athey et al. (2013); De Silva and Rosa (2025))[7].

Furthermore, the timing of first contract awards reflects both firms' endogenous participation decisions and the outcomes of competitive procurement processes. While firms choose whether and when to participate in tenders, the exact timing of winning the first contract depends on factors such as procurement cycles, competing bids, and contract-specific conditions, which are not fully predictable at the firm level. This generates variation in the timing of entry that is plausibly unrelated to short-run fluctuations in firm performance, conditional

[7]Appendix D provides suggestive evidence that the first contract is more strongly associated with subsequent financial outcomes than the second contract, supporting the use of the first contract won by a firm to define entry into the public procurement market.

on observables and fixed effects. In this sense, winning the first contract can be interpreted as a demand shock to the firm, reflecting the allocation of public contracts through competitive procedures (Hebous and Zimmermann, 2021). Similar empirical strategies have been used to study firms' entry into new markets under comparable identifying assumptions (e.g., Alfaro-Urena et al. (2022); Amiti et al. (2024); Chiappinelli et al. (2025); Lee (2021)).

4 Results

In this section, I present the results of the event studies estimations. I begin by describing the staggered entry of firms into the public procurement market, then show the main results for general and competitive entry, and finally present results by firm heterogeneity.

4.1 Staggered entry

The market has a staggered adoption of entry across firms and time. Entry is firm specific and timing varies across firms. Table 2 presents the staggered entry of firms in the public procurement market and the number of contracts they were competing for each year. In total, there were 56,141 contracts awarded from 2016 to 2024, out of which 29,306 were awarded through competitive bidding. I define the year of the first observed contract as the year of entry. This is the first contract awarded to a firm above European public procurement thresholds. The data contains a total of 4,235 events rolled out from 2017 to 2024. I define competitive mechanisms as the first time a firm wins a contract via an open procedure with at least two bidders. This corresponds to 1,095 events in the final sample over the period 2016 to 2024.

The staggered timing facilitates two comparison groups, these are, firms that never supply to the government during the sample period, and firms that have not-yet-entered by a given point in time. The preferred comparison group consists of never-supplier firms. Conditional on being similar in observable characteristics (see matching description in appendix C), these never-supplier firms inform what would have happened had a supplier firm never entered the procurement market. The strategy compares a firm's financial outcomes before and after its own entry, using matched never-suppliers to absorb common trends. A potential concern is that the decision to bid for government contracts is driven by unobservable firm characteristics. As a robustness check, I also use not-yet-supplier firms as a comparison group. By definition, the size of the not-yet-supplier comparison group declines over time as more firms enter the procurement market.

The results in this section are based on the firms reported in the Staggered columns under General Entry and Competitive Entry in Table 2. These columns report the cumulative

Table 2. Market Staggered Entry

	Awarded	General Entry		Competitive Entry	
Year	Contracts *	Events	Staggered	Events	Staggered
2016	1,835				
2017	4,698	859	859	234	234
2018	5,618	629	1,488	196	430
2019	5,971	528	2,016	131	561
2020	6,205	505	2,521	155	716
2021	6,876	437	2,958	106	822
2022	8,363	511	3,469	115	937
2023	8,397	520	3,989	109	1,046
2024	8,178	246	4,235	49	1,095
Total	56,141	4,235		1,095	

Notes: This table presents the staggered entry of firms in the public procurement market. * The column Awarded Contracts refers to contracts with no lot division. Table C1 in the Appendix presents additional columns with all contracts. The Staggered columns for general entry and competitive entry report the cumulative number of firms that have entered the market by each year over the sample period.

number of firms whose first European public procurement contract is observed by each year. For example, in 2017, 859 firms entered the procurement market under the general entry definition, which includes firms entering after submitting bids, participating in negotiations, or through other selection procedures. Of these firms, 234 entered through competitive entry, defined as winning a first public procurement contract in a procedure with at least two submitted bids. Similarly, by 2024, 4,235 firms had entered under the general entry definition, of which 1,095 had entered through competitive procedures. In annual terms, 246 firms entered for the first time in 2024, including 49 firms whose first contract was awarded through a competitive procedure.

4.2 Main results: general and competitive entry

I discuss the main results starting from three financial variables: assets growth, current ratio, and liabilities. The Figures in 1 shows the Panel A presents results for 4,235 general entry events, and Panel B for 1,095 competitive entry events. Event time 0 corresponds to the entry year. Table 3 presents the point estimates and standard errors. The event study plots for the other variables are presented in the Appendix in Figures E1 and Figures E2 and in Table E1.

I begin by examining assets growth subpanels (a) and (b) in figure 1. General entry into public procurement is associated with a positive and statistically significant increase in assets growth. In the year of entry, assets grow by approximately 8%, rising to around 11% in subsequent years. Firms that enter through competitive mechanisms experience a similar initial increase in assets of about 9% in the first year. However, this effect is not persistent and fades over time, becoming statistically insignificant one year after entry. Consistent

patterns emerge in levels. The value of assets increases by EUR 55,254 relative to never suppliers, although this result is only statistically significant at the 15% level. For firms entering through competition, the results indicate that they experience an increase in assets of EUR 52,867 the first year. However, this change is not sustained. In the subsequent years, asset levels decline relative to both pre-entry values and firms that never supply to the government.

Next, I turn to the current ratio, a balance sheet measure of liquidity. General entry into public procurement is associated with a decline in firms' liquidity relative to never suppliers. The current ratio decreases by 0.241 points (on a 0–100 scale) in the year of entry. This decline persists over time and becomes more pronounced, reaching a reduction of approximately 1.5 points five years after entry. For competitive entry, the current ratio remains unchanged in the first two years after entry. However, starting in the third year, the current ratio declines by 0.691 points, reaching a reduction of 1.02 points by the fifth year.

Entry into public procurement is also associated with an increase in liabilities. For general entry, liabilities increase by EUR 40,741 in the year following entry and reach EUR 149,864 five years after entry. Entry through competitive procedures is also associated with an increase in firms' liabilities with a raise by EUR 42,439 in the first year after entry and EUR 114,893 three years after entry.

The estimations regarding number of employees and employment growth are inconclusive on how employment responds to entry into public procurement, (see Table E1 columns (3) and (4)). For both general and competitive entry, the estimated effects on the number of employees are statistically insignificant, and although the point estimates are positive, their magnitude is economically negligible. The results for employment growth are statistically insignificant in the first four years. However, in the fifth year, general entry is associated with a decline in employment growth of 12.9%. For firms entering through competitive procedures, a decline is observed earlier, in the fourth year, amounting to a reduction of 10.6%, although this effect is less precisely estimated.

These results are suggestive of firm expansion. The results are consistent with previous literature showing that winning procurement contracts facilitates access to credit (di Giovanni et al., 2024). Assets growth, these results suggest that while entry is associated with firm expansion, only general entry leads to sustained asset growth, whereas competitive entry generates short-run increases that are not maintained over time. These results are similar from the results of Fadic (2020) who finds that firms that win in randomized contest their revenues and assets revert back to pre-shock levels.

The findings on employment are consistent with the mixed evidence in the literature on public procurement (Gugler et al., 2015; Srhoj and Dragojević, 2024). Several mechanisms

may explain these results. First, general equilibrium effects may dampen net employment gains, as increased activity among winning firms may be offset by reduced activity among competitors (Ferraz et al., 2015; Srhoj and Dragojević, 2024). Second, firms may rely on subcontracting, particularly in labor-intensive contracts, limiting the extent to which employment expands within the firm.

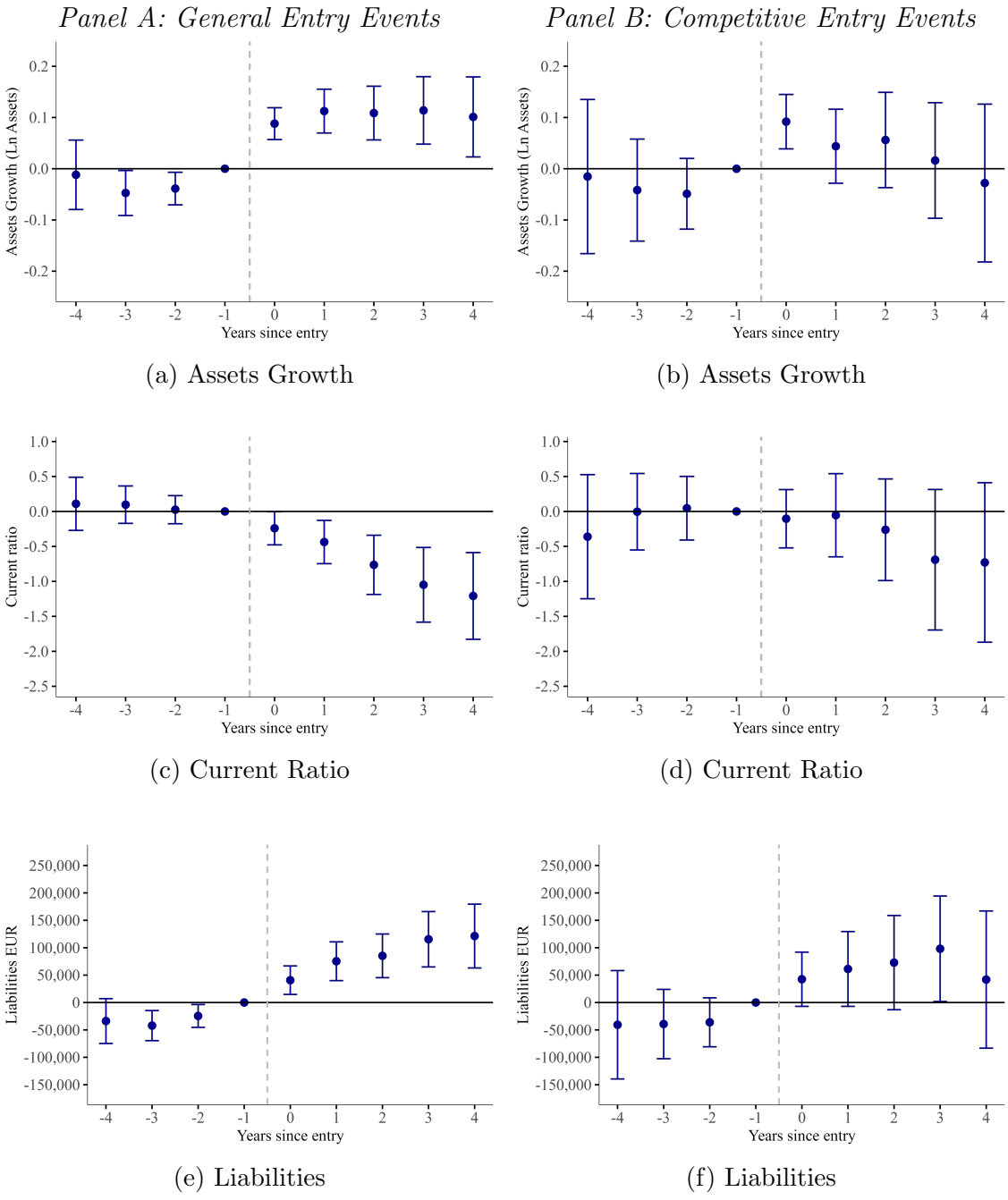
Are changes in financial performance persistent? As a benchmark, I also aggregate the estimates of $\widehat{\gamma}^{CS}(g,t)$ across post-entry years to obtain the overall effect. The goal is to add to the discussion of whether entering a procurement market has persistent effects (Gugler et al., 2015). The estimates provide a measure of whether entry into public procurement markets generates persistent changes in firms' financial performance.

The overall estimates indicate that general entry into the public procurement market is associated with asset growth relative to matched never suppliers (see Table E2). The change in total assets in levels is positive but not statistically significant, with an estimated increase of EUR 28,065. In contrast, the log specification shows a statistically significant increase of 9.9%, suggesting that general entry is associated with growth in firms' asset base. For competitive entry, the evidence on asset growth is weaker. The estimated effect on total assets is small and statistically insignificant, and the log asset estimate is also not statistically different from zero. Thus, unlike general entry, competitive entry does not appear to be associated with an overall increase in assets relative to never suppliers.

The results for liabilities show a different pattern. Liabilities increase significantly under both general and competitive entry, although the estimated change is larger for general entry. General entry is associated with an increase in liabilities of approximately EUR 97,975 and liability growth of 22.3%, while competitive entry is associated with an increase of EUR 71,887 and liability growth of 13.5%. These results suggest that entry into the procurement market is accompanied by greater financial obligations, with stronger effects among firms entering under the broader general-entry definition.

Overall, these results suggest that entry into public procurement is associated primarily with balance-sheet adjustments rather than broad-based firm expansion. Firms appear to take on more liabilities and experience weaker liquidity after entry, while evidence of sustained growth in assets and employment is more limited, especially among firms entering through competitive procedures.

Figure 1. Event Study Plots Financial Performance



(a) Assets Growth (b) Assets Growth

(c) Current Ratio (d) Current Ratio

(e) Liabilities (f) Liabilities

Notes: Figure 1 plots the estimated event-study coefficients, $\hat{\gamma}$, from equation 3. Panel A presents results for general entry, while Panel B reports results for competitive entry. Sub-panels (a) and (b) display estimates for capital asset growth (Columns 1 and 6 of Table 3); (c) and (d) for the current ratio (Columns 3 and 8); and (e) and (f) for liabilities (Columns 5 and 10). The event study plots for the other variables are presented in the Appendix in Figures E1 and Figures E2 and in Table E1.

Table 3. Event Study Estimates Financial Performance

	Panel A: General Entry Event					Panel B: Competitive Entry Event				
Event	Ln Assets	Assets	Current Ratio	Ln Liabilities	Liabilities	Ln Assets	Assets	Current Ratio	Ln Liabilities	Liabilities
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
5 years before entry	-0.017	22,353.825	0.042	-0.173*	-63,614.960*	-0.006	27,548.095	-0.458	-0.125	-54,092.621
	(0.040)	(38,011.255)	(0.240)	(0.039)	(22,052.895)	(0.085)	(80,598.633)	(0.517)	(0.088)	(39,651.157)
4 years before entry	-0.012	-18,894.554	0.109	-0.140*	-33,837.325	-0.015	-57,875.838	-0.361	-0.118	-40,624.794
	(0.025)	(27,493.495)	(0.142)	(0.029)	(14,984.239)	(0.055)	(52,554.406)	(0.339)	(0.052)	(35,346.500)
3 years before entry	-0.047*	-60,658.226*	0.097	-0.120*	-42,143.847*	-0.042	-78,318.391	-0.004	-0.094*	-39,311.854
	(0.016)	(17,595.090)	(0.100)	(0.018)	(10,041.671)	(0.037)	(33,976.448)	(0.209)	(0.033)	(22,601.316)
2 years before entry	-0.039*	-62,693.319*	0.025	-0.066*	-24,506.024*	-0.049	-61,256.044	0.046	-0.063	-36,101.234
	(0.012)	(12,432.310)	(0.075)	(0.013)	(7,626.737)	(0.025)	(22,475.746)	(0.174)	(0.025)	(15,970.613)
Year of entry	0.088*	14,952.516	-0.241*	0.113*	40,741.166*	0.092*	52,867.741	-0.104	0.134*	42,439.420
	(0.011)	(14,686.759)	(0.089)	(0.014)	(9,520.227)	(0.020)	(30,556.783)	(0.159)	(0.026)	(17,678.862)
1 year after entry	0.113*	-1,288.540	-0.437*	0.181*	75,335.956*	0.044	-46,056.163	-0.054	0.109*	61,217.398
	(0.016)	(22,275.253)	(0.116)	(0.019)	(12,948.732)	(0.027)	(41,717.855)	(0.227)	(0.036)	(24,396.528)
2 years after entry	0.109*	-493.401	-0.763*	0.221*	85,184.149*	0.056	-48,694.382	-0.262	0.151*	72,822.632
	(0.019)	(27,745.709)	(0.158)	(0.024)	(14,586.659)	(0.034)	(58,118.651)	(0.278)	(0.048)	(30,730.141)
3 years after entry	0.114*	52,254.883	-1.049*	0.267*	115,446.096*	0.016	-32,439.528	-0.691	0.161	98,080.252*
	(0.024)	(34,879.467)	(0.199)	(0.032)	(18,491.265)	(0.042)	(63,809.280)	(0.384)	(0.060)	(34,403.672)
4 years after entry	0.101*	56,550.350	-1.208*	0.249*	121,279.188*	-0.028	27,100.160	-0.729	0.079	41,869.886
	(0.028)	(43,990.882)	(0.232)	(0.037)	(21,317.577)	(0.057)	(90,660.685)	(0.436)	(0.074)	(44,740.563)
5 years after entry	0.070	46,411.588	-1.542*	0.310*	149,864.290*	-0.028	59,421.018	-1.092	0.175	114,893.540
	(0.036)	(50,483.995)	(0.275)	(0.043)	(26,807.631)	(0.064)	(96,323.112)	(0.532)	(0.082)	(54,100.662)
Observations	13,445	13,445	13,258	13,205	13,245	3,348	3,348	3,305	3,263	3,278
Cohorts	8	8	8	8	8	8	8	8	8	8
Years	13	13	13	13	13	13	13	13	13	13

Notes: This table presents the estimations of event studies using Callaway and Sant'Anna estimator. Comparison group is sample of matched never suppliers. Standard errors in parenthesis clustered at firm level. Cohort defined by year of entry in the public procurement market; the first year in which the firm was awarded a contract by a public entity.

Alternative comparison: Not-yet-suppliers So far, the results are based on estimations that use matched never-suppliers as the comparison group. However, using firms that never enter the public procurement market raises concerns about their comparability with first time entrants, as these firms may differ systematically in both observable and unobservable characteristics. To address this concern, I estimate equation 3 and compute the aggregated γ_j coefficients as in equation 5, but now using firms that have not yet entered the procurement market as the comparison group. In the terminology of the difference-in-differences literature, these firms are not yet treated. This comparison group is informative, as it captures firms that may eventually enter the market and therefore provides another comparable group. This will provide insight into the role of selection into procurement. Figures F1 present the results from both specifications: estimations using never-suppliers (in blue, with solid confidence intervals) and estimations using not-yet-suppliers (in red, with dotted confidence intervals). For expositional clarity, I focus on asset growth, while the full set of results is reported in the tables F1 and F2. The results are qualitatively consistent across the two specifications for both asset growth and liability growth. However, point estimates differ in magnitude, and in some cases lose statistical significance when using not yet suppliers as the comparison group. This may be driven by the smaller effective sample size in this specification. For general entry, the estimates using not-yet-suppliers differ from the estimates using never suppliers in both magnitude and direction for the current ratio, equity, and employment growth. These differences suggest that selection into public procurement markets may play an important role in shaping firm outcomes. For firms entering through competitive mechanisms, the results remain largely stable across specifications. Finally, I find no evidence of differential pre-trends in either specification, supporting the validity of the conditional parallel trends assumption.

4.3 Firms heterogeneity

I study firm heterogeneity by classifying entrants into three types and re-estimating the event studies for each, with financial outcomes measured relative to matched never-suppliers. The three types are defined as follows. Short-term participants are firms observed only in the year of entry. Capacity-constrained firms are active upon entry and in subsequent years, but participate intermittently, exhibiting gaps over time. Established firms enter the market and remain continuously active thereafter, with no observable interruptions. This typology is motivated by the concern that entry may be correlated with observed and unobserved firm characteristics (Krasnokutskaya, 2011; De Silva et al., 2009), which could lead to overestimated effects due to non-random selection and unobserved heterogeneity. The aim is not to compare the three groups as if they were randomly assigned, but to decompose the

average post-entry effect by procurement trajectory and document how financial outcomes differ across firms with different degrees of market engagement.

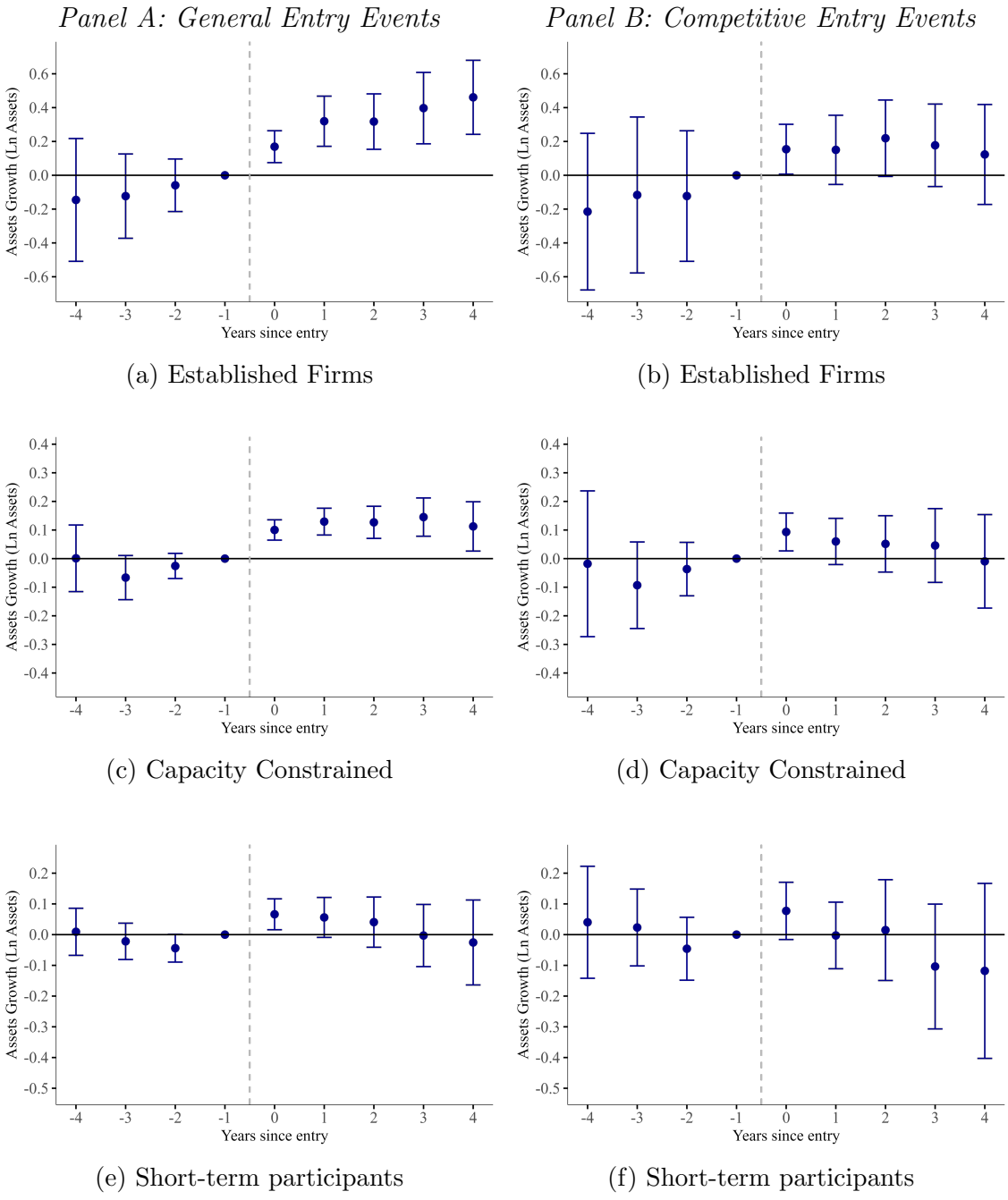
The three groups differ along observable dimensions, consistent with the view that the typology captures meaningful variation in firm characteristics (see Table E3). Established firms are medium-to-large enterprises of approximately 17 years since incorporation; upon entry they are awarded on average more than ten contracts, and they continue to scale their procurement activity over time. Capacity-constrained firms are smaller, participate intermittently, and display patterns consistent with binding resource or production constraints. Short-term participants are the smallest firms, typically awarded a single contract upon entry. All three types are heavily concentrated in the services sector (around 80 to 85%). Established firms win substantially more tenders and are awarded higher-value contracts on average, while contract duration is broadly similar across groups, approximately 36 months.

The heterogeneity analysis reveals that both the magnitude and persistence of post-entry gains are associated with firm type (see Figure 2). Established firms exhibit the strongest response, with asset growth of about 16% following general entry that remains persistent over time, while the 15% increase under competitive entry dissipates. Capacity-constrained firms also experience positive effects, though more moderate: asset growth reaches around 10% under general entry and remains relatively stable, whereas the 9% increase associated with competitive entry fades over time. In contrast, short-term firms display the weakest and least durable effects, with a 6% increase under general entry that disappears within two years, and a 7% gain under competitive entry that similarly dissipates. The results in other financial variables indicate a broadly consistent pattern (see Appendix E.1). General entry is associated with increases in assets and liabilities for established and capacity-constrained firms, alongside positive and significant liability growth for all firm types, but a decline in liquidity (current ratio) for the former two groups. In contrast, competitive entry yields largely insignificant effects, with the exception of positive liability growth for established and capacity-constrained firms. Short-term firms show no significant changes in assets or liabilities under either entry mode. Across all specifications, shareholder funds and solvency ratios remain unaffected. Employment effects are also limited: the number of employees does not change significantly for any firm type, while employee growth is generally unaffected except for a delayed decline among short-term firms, which becomes statistically significant only four years after entry.

A potential concern with this typology is that the classification is partly based on firms' subsequent procurement participation: short-term participants are defined by not winning further contracts after entry, so weaker financial performance might appear mechanically related to the group definition. I argue this concern is limited for two reasons. First, the

outcome of interest is firm-level financial performance beyond the procurement market, not subsequent procurement success; weaker post-entry financial outcomes are not mechanically implied by failing to win another public contract, and may instead reflect adjustment costs, crowding out of other activities, or genuine capacity constraints. Second, entry into public procurement can be interpreted as an intention-to-treat event: winning a first government contract may confer a reputational signal or access to new markets, but firms differ in their ability or willingness to exploit this opportunity. From this perspective, the three groups correspond to different degrees of post-entry treatment uptake; established firms are high-uptake, capacity-constrained firms are intermittent-uptake, and short-term participants are low-uptake. The estimates should therefore be read not as causal effects of firm type, but as descriptive evidence on how financial trajectories differ across firms with varying levels of post-entry procurement engagement.

Figure 2. Event Study Plots Financial Performance: Assets Growth



(a) Established Firms

(b) Established Firms

(c) Capacity Constrained

(d) Capacity Constrained

(e) Short-term participants

(f) Short-term participants

Notes: Figure 2 plots the estimated $\hat{\gamma}$ event-study coefficients from the regression given in equation 3. Panel A presents the event study plots for general entry and Panel B for competitive entry. The dependent variables are: capital assets growth panels a and b, current ratio panels c and d, and liabilities panels e and f. Estimations based on Callaway and Sant'Anna estimator presented in table 3. In the appendix, figures F2 show the estimations using not-yet suppliers; the results are qualitatively similar.

5 Mechanisms

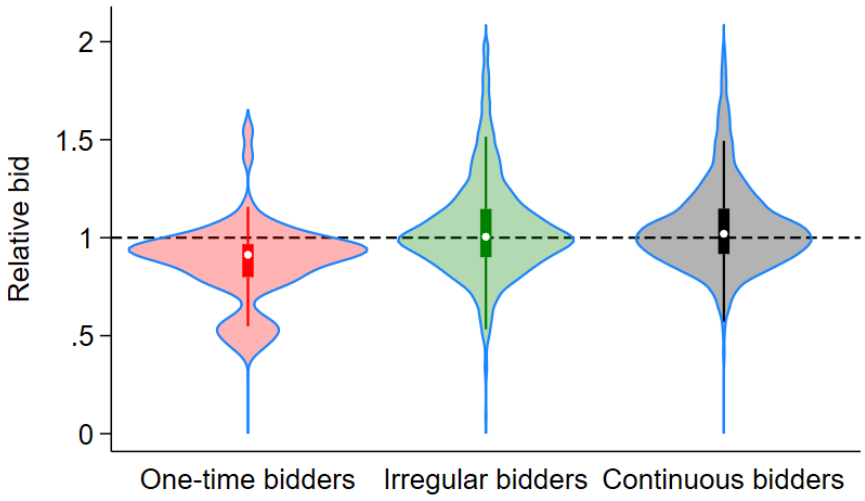
This section explores the mechanisms that rationalize why entry into public procurement markets does not uniformly translate into improved firm financial performance, particularly when entry occurs through competitive procedures. The empirical results also indicate that short-term participants exhibit short-run gains and weaker financial outcomes, while more established firms benefit persistently. I discuss two mechanisms that can account for these patterns: underbidding and selection into less competitive procurement environments.

5.1 Underbidding

A first mechanism relates to differences in bidding behavior across firms. I find that short-term entrants submit more aggressive bids relative to established firms. This pattern is consistent with a winner's curse mechanism, particularly observed in common value auctions. Previous literature shows that public procurement markets exhibit this pattern, specifically that firms with less experience or limited information systematically underestimate the true costs of contract execution (De Silva and Rosa, 2025; Jääskeläinen et al., 2026).

To explore pricing mechanisms, I use the subsample of auctioned tenders from one public buyer from 2012 to 2024. Figure 3 shows the density distribution of relative bids across firms, using violin plots over the range from 0 to 2 on the y-axis. The width of each violin reflects the density of observations at a given value, such that wider regions indicate a higher concentration of bids. Firms are grouped according to their bidding frequency. One-time bidders are observed only once, irregular bidders participate intermittently, and continuous bidders are observed consistently every year. The dashed horizontal line at 1 represents a benchmark corresponding to the engineer's cost estimate. Each violin contains a boxplot indicating the median and interquartile range of the distribution. An interesting feature of this plot is to check whether the median lies below 1, which would suggest that, on average, firms in that group submit bids below the engineer's estimate.

Figure 3. Distribution of relative bids by bidder type



Notes: Distribution elaborated based on ProRail data.

The visual evidence indicates that one time bidders consistently submit bids below the engineer's estimate. To quantify these differences, I estimate a reduced form regression of bid functions as in equation 6, following the structural models developed by Bajari and Ye (2003) and De Silva et al. (2003). The relative bid of firm i denoted as rb_i and it is calculated as the ratio between the amount bid by firm i on contract c and the engineer's cost estimate for the contract, $\frac{Bid_i}{\text{Est.cost}_c}$.

The specification in equation 6 includes dummy variables for one time bidders and irregular bidders, leaving continuous firms as a baseline. In the appendix, I present an alternative version of this equation and use the definitions of short-term participants, capacity constrained firms, and established firms used in the previous firms' heterogeneity analysis (see table F3). To control for firm characteristics, I include a vector X with firms' age and status of certification, as indicated by ProRail. The buyer has in place a certification program to guarantee safety some projects need it and some not, this is a relevant control as it may be associated with the type of firms that bid and the type of projects. Additionally, I include type of project fixed effect to control for sector specific effects ω_p and I control for year effect τ_t.

$$rb_{ic} = \alpha_0 + \alpha_1 \text{OneTime} + \alpha_2 \text{Irregular} + \beta_1 \text{X}_i + \omega_p + \tau_t + \varepsilon_{ic} \tag{6}$$

Table 4 presents the results of estimating 6. Column (1) includes only the dummies for one-time bidders and irregular bidders and does not include any fixed-effects. The estimated α_1 indicates that one-time bidders bid approximately 17.5 percentage points lower relative to the engineer's estimate. Column (2) cluster standard errors at the firm level and does not include additional controls, even though the standard error increases the estimation

Table 4. Relative bid reduce form regression

	(1)	(2)	(3)	(4)
One Time Bidder	-0.172***	-0.172***	-0.353***	-0.353***
	(-4.83)	(-5.30)	(-5.82)	(-5.82)
Irregular Bidder	0.00167	0.00167	0.00983	0.0101
	(0.21)	(0.19)	(0.71)	(0.73)
Firm age			0.000301	0.000301
			(1.00)	(1.00)
Certified Firm			0.0103	0.0103
			(0.77)	(0.77)
Constant	1.069***	1.069***	1.056***	1.056***
	(264.23)	(162.87)	(78.16)	(77.96)
Observations	6672	6672	6609	6599
R^2	0.00353	0.00353	0.412	0.411
R^2adj	0.00323	0.00323	0.157	0.156
FE Year	No	No	No	Yes
FE Project	No	No	No	Yes
FE Contract	No	No	Yes	No
Type of Cluster	None	Firm	Firm	Firm

Notes: Estimations of equation 6. t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

remains similar. Column (3) includes fixed effects at contract level and includes the set of controls. The results now indicate that conditional on auction and firm characteristics, one-time bidders underbid by 35.3%. This suggests compositional differences across contracts that mask the extent of aggressive bidding by one-time bidders. Column (4) saturates the regression with additional fixed effects and the estimation of α_1 remain significantly at 35.3%. The inclusion of contract fixed effects ensures that comparisons are made across firms bidding for the same contract.

Overall, the descriptive evidence suggests that one-time bidders and short-term participants systematically underbid relative to more regular bidder firms, a pattern consistent with a winner's curse mechanism and learning-by-doing. This behavior helps explaining the main findings on entry, which indicate that new-entrants experience only short-run benefits, whereas established firms bid better and exhibit persistent and significant improvements in financial performance.

5.2 Number of competitors

A second mechanism concerns the type of procurement environments in which different firms participate. The number of bidders is a widely used indicator of competition in empirical studies. A higher number of participants typically increases the likelihood of attracting more

efficient firms in the market and desincentivizes collusive behavior (Dimitri et al., 2006, page 267). I test this mechanism by estimating a reduced form of the models developed by Bajari and Tadelis (2001); De Silva and Rosa (2025) as shown in equation 7. The specification consist on the number of bidders per contract N_c as dependent variable in a poisson regression with dummy variables indicating whether the contract was an entry event by including dummy indicator for general entry event and a dummy for competitive entry event. Then I include dummies and the type of firm awarded the contract, short-term participants and capacity constrained leaving established firms as reference group. I also include controls for tender characteristics, as well as fixed effects for industry, year, and buyer, to account for systematic differences across procurement environments.

$$\begin{aligned} N_c = &\beta_0 + \sum \beta_j \text{Entry Event} + \sum \beta_g \text{TypeFirm} \\ &+ \sum \delta_{jk} \text{Entry Event} * \text{TypeFirm} + \alpha_3 \text{Z}_c + \mu_s + \psi_t + \phi_b \end{aligned} \tag{7}$$

At first the estimation of β_j indicates that entry events are associated with a higher number of bidders, Column (1) of Table 5, which is consistent with the simple descriptive statistics. However, once I include controls and fixed effects, the estimation of β_j indicates that general entry events are associated with a lower number of bidders. Particularly, when including short-term participants interacted with general entry events, the estimation of δ_{jk} indicates that contracts to which short-term firms enter are associated with a lower number of bidders. Conditional of contract characteristics and fixed effects, the expected number of bidders is 8.13%[8] lower for contracts to which short-term firms enter compared to contracts where established firms entered, Column (5) of Table 5. When including capacity constrained firms interacted with general entry events, the estimation of δ_{jk} indicates that contracts to which capacity constrained firms enter are associated with a lower number of bidders. Conditional of contract characteristics and fixed effects, the expected number of bidders is 9.74% lower for contracts to which capacity constrained firms enter compared to contracts where established firms entered.

This suggests that new entrants tend to enter in less competitive procurement environments. This pattern is consistent with the idea that less established firms may strategically target tenders with fewer competitors, which may be perceived as less risky or more accessible given their limited experience and information.

These findings may also indicate that contracts have different levels of attractiveness and profitability, which may influence the type of firms that choose to participate. The estimations in Table 5 suggest that more expensive contracts attract more bidders, while

[8]Interpretation of coefficient based on $100 * (exp(-0.0848) - 1)$

longer duration contracts are associated with fewer bidders. However, differences in other observable contract characteristics are not strongly associated with number of bidders. Table F4 in the appendix shows the descriptive statistics associated to whether the contract is part of the World Trade Organization agreement, has extensions, is an urgent procedure, includes outsourcing, is classified as a SME tender, and the type of infomation regarding final price, estimated cost, and type of award criterion. These characteristics are not strongly associated with the type of firms that enter, which suggests that the observed differences in number of bidders may be driven by unobservable contract characteristics.

This mechanism helps reconcile two empirical findings. On the one hand, short-term participants are able to enter and win contracts. On the other hand, they do not experience sustained improvements in financial performance. If these firms systematically enter less competitive or less profitable tenders of the public procurement market, the contracts they win may not generate the same benefits as those obtained by more established participants. In summary, I find that short-term entrants tend to win contracts in auctions with fewer competitors. Recent studies discuss informational channels (Carril et al., 2026) and market structure (Jääskeläinen et al., 2026) as channels for similar findings. Tenders with fewer competitors may appear to have lower barriers to entry, allowing short-term participants to secure contracts despite incomplete information and their limited experience. However, these environments may also be associated with less attractive projects. For instance, contracts with fewer bidders may involve higher uncertainty, lower expected profitability, or greater complexity, deterring more established firms from participating.

6 Discussion

While this paper documents significant heterogeneity in financial outcomes following entry into public procurement markets, several important avenues merit future investigation. Throughout the paper I relied on a conditional parallel trends assumption that can be compatible with selection into treatment when this is based on pre-treatment information and time-invariant unobservables (Ghanem et al., 2022). A key limitation is that entry decisions are likely subject to dynamic selection, where firms choose to enter based on time-varying expectations about profitability that are not fully captured by observable firm characteristics or fixed effects. Unobservable dimensions such as managerial quality, technological capability, or market-specific information asymmetries may drive both the decision to enter procurement markets and subsequent financial trajectories. A fruitful avenue of research is the exploration of dynamic selection mechanisms more explicitly, for instance, by implementing Heckman and Navarro (2007) a methodological approach that bridges dynamic discrete choice and dynamic treatment effects. Decomposing bias due to dynamic selection will better

inform which type of firms benefit the most from supplying to government and how market design of public procurement can be improved.

Beyond market design, future research should address the role of unobservable contract characteristics and the market structure of public procurement. Detailed information on contract complexity, technical specifications, relationship-specific investments, or strategic importance to incumbent suppliers is often unavailable in administrative data. Such unobserved heterogeneity may explain why even matched entrants experience divergent trajectories. Furthermore, the aggressive bidding strategies observed among short-term participants, particularly in less competitive procurement environments, raise questions about whether incumbents can maintain positions through tacit coordination or information advantages that effectively deter entry. Future work incorporating qualitative evidence on procurement practices, interview data with firms and procurement officials. Such research would improve our understanding of whether limited persistence reflects firms' inability to execute public contracts profitably, or whether it instead reflects market structures and practices that limit genuine competition and reduce incentives for sustained participation among new entrants.

Finally, while the contract data are relatively complete one limitation is worth noting. With some exceptions, contracts below EU procurement thresholds are not observed. My definition of entry captures the first observed participation in contracts above these thresholds, which may not coincide with a firm's initial entry into national public procurement markets. Consequently, I interpret my results as characterizing entry into large-scale procurement markets, rather than initial participation. This distinction is economically meaningful because contracts above EU thresholds represent a new market with likely higher fixed costs and complex bidding requirements. Entry at this margin reflects firms becoming first-time suppliers in more demanding segments of the public procurement market, where selection and competition may operate differently than in smaller contracts. The result should be interpreted as evidence on the specific margin of entry, while entry into smaller contracts or individual auctions remains an important avenue for future research.

7 Conclusions

This paper provides new evidence on how entry into public procurement markets shapes firms' financial performance and highlights the importance of distinguishing entry mechanisms. While entry through general procurement procedures is associated with asset growth, entry through competitive bidding does not generate persistent financial improvements. This distinction is empirically important given the documented decline in bidder participation and highlights a critical gap: entry alone is insufficient to guarantee firm growth. The heterogeneity analysis reveals that gains depend substantially on firm type. Established firms

obtain larger and more sustained improvements, while capacity-constrained firms exhibit weaker persistence, and short-term participants experience only temporary gains. Notably, short-term participants bid more aggressively and systematically enter less competitive procurement environments, a pattern consistent with a winner's curse mechanism and learning-by-doing effects.

The results indicate that public procurement functions more as a selection mechanism than as a driver of firm growth. Entry exposes firms to competitive pressures that not all can manage effectively, particularly when bidding strategies are aggressive and experience is limited. Many entrants fail to translate initial contract wins into sustained financial performance, while a smaller cohort of established firms consolidates their position over time. This dynamic explains both the concentration of procurement benefits among established suppliers and the declining participation in public tenders. It suggests that policies aimed solely at lowering barriers to entry are insufficient to sustain competition. Instead, procurement market design can shape policies that strengthen firms' capacity to remain active participants and compete effectively over time.

Table 5. Number of bidders, entry events and type of firms

	Number of Bids				
	(1)	(2)	(3)	(4)	(5)
Variables					
General entry event	0.0446***	-0.0471***	-0.0415***	-0.0352***	0.0309
	(0.0098)	(0.0104)	(0.0135)	(0.0135)	(0.0247)
Competitive entry event	0.1853***	0.2592***	0.2511***	0.3060***	0.2415***
	(0.0168)	(0.0181)	(0.0230)	(0.0478)	(0.0519)
Short-term participant			0.0009	-0.0142	-0.0126
			(0.0245)	(0.0247)	(0.0248)
General × Short-term participant			-0.0142	-0.0186	-0.0848**
			(0.0316)	(0.0317)	(0.0379)
Competitive × Short-term participant			0.0202	-0.0353	0.0291
			(0.0364)	(0.0555)	(0.0591)
Capacity Constrained				-0.0254***	-0.0223***
				(0.0054)	(0.0055)
Competitive × Capacity Constrained				-0.0634	0.0248
				(0.0505)	(0.0577)
General × Capacity Constrained					-0.0915***
					(0.0290)
Log Contract Value	0.0034**	0.0106***	0.0106***	0.0104***	0.0104***
	(0.0017)	(0.0023)	(0.0023)	(0.0023)	(0.0023)
Log contract length	-0.0786***	-0.0192***	-0.0192***	-0.0189***	-0.0189***
	(0.0052)	(0.0070)	(0.0070)	(0.0070)	(0.0070)
Constant	1.839***				
	(0.0435)				
Year FE	No	Yes	Yes	Yes	Yes
Authority FE	No	Yes	Yes	Yes	Yes
Industry FE	No	Yes	Yes	Yes	Yes
Observations	43,595	43,233	43,233	43,233	43,233
Pseudo R^2	0.00209	0.13652	0.13652	0.13663	0.13667

Notes: Estimations based on a Poisson pseudo maximum likelihood regression. Interpretation based on $100*(exp(\beta)-1)$ transformation. Poisson fixed-effects models estimated using `fepois`. All specifications include year, contracting authority, and industry fixed effects. Standard-errors in parentheses. ****: 0.01, **: 0.05, *: 0.1.*

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Appendix

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A Details public procurement Data

This section provides details on the main and complementary datasets used in this chapter.

A.1 Public procurement data extracted from the Dutch government's tendering platform

The main dataset is the public procurement data extracted from the Dutch government's tendering platform *TenderNed*. The data available in TenderNed is the main complete source of public contracts in the Netherlands. TenderNed is part of the Netherlands Enterprise Agency *Rijksdienst voor Ondernemend Nederland (RVO)* which belongs to the Ministry of Economic Affairs *ministerie van Economische Zaken (EZ)*. While TenderNed offers a centralized platform for the announcements, contracting authorities can also use other tendering platforms for conducting the tender. The most used ones are platforms owned by Mercell. TenderNed imports these notices into their database. In fact, 55% of the tenders available in TenderNed are flagged as imported from other platforms. I extracted the datasets from TenderNed during January and February 2025. The dataset contains about 320,000 tender announcements over 2016-2024, some are contract notices and some are contract award notices. I filter the data to analyze 68,531 awarded contracts over this period, of which 56,141 are not divided into lots. Some of the relevant variables for the research design are:

- Name and chamber of commerce number of the firm awarded the contract
- Date of publication of the contract
- Value of the contract awarded
- Type of procedure used to select the supplier
- Award criteria
- Number of bidders per contract
- Name of the public buyer

While TenderNed is a reliable source of information for public procurement in the Netherlands, the available datasets poses some important limitations and misreporting issues. The most relevant ones for this study are that the name and identification number of the firm that was awarded a contract are not always available, the value of the contract is missing in several cases, the estimated value of the contract is missing as well in several cases. According to TenderNed, about 72% of the available data corresponds to the information found in

the original tender documents (TenderNed, 2025a)[9]. This implies that the missing information is not directly recoverable from scraping the original announcement and documentation. Considering this limitation, I implement a text similarity check to recover names and identification of the winning firms, and adopt an imputation strategy to recover contract awarded value.

A.2 Firm names recovering text similarity

The identity of the winning firm is required to link the procurement data to external sources of information. However, in the raw data, 6,916 tenders (9.4%) did not report the name of the winning firm, and 34,484 tenders (47%) reported a firm name but no identifying number. The tenders without any winner name (9.4%) contained no further information from which a firm identity could be recovered[10]; these cases are excluded from further identification efforts. The remaining 47% of tenders provided a firm name but lacked a firm identifier. Given that identifiers are crucial to enable linking with financial datasets, I implement four steps to recover them whenever possible.

First, I search for additional information on firm names and firm identifiers from alternative TenderNed sources, including the public API[11]. Second, I construct a consolidated pool of firm names and identifiers derived from both the API and the initial data extraction. In this step, I standardize and clean names by removing punctuation, special characters, and common particles. Third, I fill in missing identifiers by grouping entries with the same name. This is, I group the data by names and I propagate the identifier to the missing ones. This happens when a firm is awarded two different tenders, in one tender, the public buyer published all the information of the tender and in the other tender the buyer only published the name of the firm without the firm identifier. Fourth, I use a complete reference list of company names, each linked to at least one legal identifier [12], and apply text-similarity

[9]Recently, TenderNed has put into place several strategies to improve the quality of the data. In September 2025, TenderNed announced that they have implemented a data extraction tool from tender documents. According to their preliminary findings about 72% of the tender information is found in both original dataset and the scrapped documents. This report also implies that the documents are not as complete as they could or should be. This suggestion implies that data used in this paper underestimates some tender characteristics such as contract duration.

[10]An initial exploration of the website and pdfs downloaded from it revealed that misreporting and missing information take place from the original sources. Therefore, I discarded a web-scraping alternative. I performed this exploration before TenderNed published their results from a similar strategy (TenderNed, 2025b)

[11]TenderNed has an API available where information is available for queries. The query relies on publication identifier, not tender identifier. In TenderNed, each publication is linked to one contract, and its lots when the contract is divided into lots, but each contract can have more than one publication. In fact, 45% of tenders have two associated publications: one contract notice and one contract award notice. I use both types of publications to recover the missing company names or company identifier to use in the pool of names and for feeding the text similarity algorithm. Ultimately, in my sample, I use tenders awarded to only one company and with no division into lots.

[12]According to the Dutch Chamber of Commerce, every legal entity has a Legal Entity Partnership Infor-

algorithms to match firm names in the procurement data to this reference list and recover missing identifiers. Through this process, I recover 21,773 firm identifiers that are suitable for linking with additional data sources. This result allows me to effectively use 13,695 firms in the empirical strategy. At the time of performing this procedure, I did not have access to additional data from Statistics Netherlands (CBS), whose researchers merged tendered data with their microdata in 2023 (Bos and Sleijpen-Snoek, 2023; Jansen et al., 2023). Their studies cover the period 2017-2021. In contrast, here, I have aimed to provide a slightly longer historical scope, covering 2016 to 2024. Future collaboration could further extend and validate this linkage effort.

A.3 Final contract price and income from public procurement

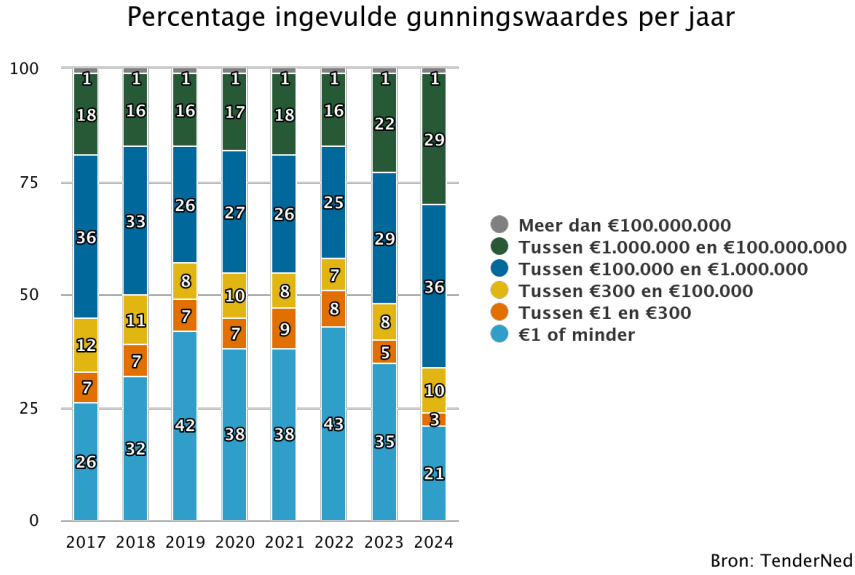
Public procurement contracts that exceed the European thresholds are expected to report the estimated value of the contract, and when publishing a contract award notice, this shall also indicate the final price or range of prices (maximum/minimum) paid (European Directive, 2014, page 218). The final price is the total amount the public entity pays to the winning firm. However, the data suffer from a large misreporting issue with an average of 34% of tenders published with an award value of 1 Euro or less (see figure A1 TenderNed (2025a)). The 1 Euro tenders phenomenon is less evident in tenders from central government institutions, such as ministries and central government organizations. However, this misreporting is a common feature of the data.

Besides the 1 Euro phenomenon, the raw data have a third of the tenders with missing information in the final value. To address this issue, I construct an imputed measure of contract value that follows a transparent hierarchy of information sources in accordance to the requirements suggested in the European Directive 2014. The guiding principle is to use the most reliable monetary information first, and only rely on more indirect proxies when necessary.

I exploit the fact that tenders in TenderNed have four fields with monetary information: the estimated value of the contract, the final price of the tender, and the lowest bid received and the highest bid received in the competition; and that tenders may appear multiple times because they are associated with different publication types, such as the contract notice, the contract award notice, corrections, rectification, and pre-announcements. These multiple publications often contain complementary monetary fields. The imputation proceeds as follows. First, I start with the final contract value of the tenders from the award publication.

mation Number (RSIN), every business has a single Chamber of Commerce number in the Trade Register (KvK-nummer), some firms have an establishment number (Vestigingsn-nummer), and lastly, some firms whose owner acts as a sole proprietorship, or director of a private limited company, or chairman of an association, then the firm would be assigned the Personal Registration Number of the owner(Kamer van Koophandel, 2024). Some firms can also be identified by their European VAT number.

Figure A1. Misreporting of contract values of public procurement contracts



Notes: Notes: Graph extracted from TenderNed.nl

Second, when the final value is not reported, but the estimated contract value is available in the award publication, I assign the estimated value to the missing final value. The estimated value is a good proxy because it '*... includes all expected revenues for the best bidder resulting from winning the contract. This includes payments from the client to the contractor, any commissions, bonuses, design fees, all third-party funds, interest payable, and so on.*' Pianoo (2025). Third, if neither final nor estimated values are available in the award notice, I look for these variables in other publication types for the same tender. Here I make use of the assumption that the estimated value was published in the contract notice but the final price was not published in the contract award notice, or that the final price was published in a rectification notice. Fourth, some tenders are divided into lots. The European Directive 2014 indicates that 'contract notices shall include the estimated total order of magnitude of contract(s) and this information shall be provided for each lot' (page 212). In that case, I add up the final value of each individual lot to create the tender final value. When the final value is missing, I add up the estimated value of each lot and use this sum to impute the final value of the tender. As a third step, I impute remaining missing values by adding up the values of the rectification publications, if any. Nonetheless, for my main analysis, I limit my sample to tenders with only one lot, and only one winner. Fifth, some award publications do not report the final price perhaps due to the ambiguity in the European Directive as it states that 'that award notices shall provide the value of the successful tender (tenders) **or** the highest tender and lowest tender taken into consideration for the contract

award or awards' (Part D). Thus, I make use of these two sources of monetary information to impute the remaining missing values. Following suggestive evidence that approximately 59% of the tenders in the Netherlands are awarded to the lowest bidder(Schotanus et al., 2022), I compute an estimation that assigns 60% of probability for the tender to be the lowest bid and 40% probability to be the average between the highest and the lowest bid, assuming that in the other cases, the allocation mechanism is a scoring auction[13]. Finally, for European single-lot tenders with missing or implausibly low estimated values, I assign standard EU procurement threshold values based on the type of contract. In particular, I replace such values with EUR 5,538,000 for works contracts, EUR 216,000 for supplies, and EUR 750,000 for services. This step ensures consistency with the regulatory framework, as tenders above these thresholds are subject to European procurement rules, and prevents distortions arising from missing or misreported estimated values.

A.4 Additional description of procurement contracts

Table A1 shows descriptive statistics for the contract-level data without restricting the sample to events and event of firms in the estimation sample. The average contract has a value of EUR 1.8 million. The average number of bidders per tender is around 3.8, indicating moderate competition in the market. The distribution of contract types is relatively balanced between works, services, and supplies.

Table A1. Descriptive statistics for all contracts

	Panel A: All Contracts				Panel B: Competitive Contracts					
Variable	Mean	Median	Std.Dev.	N	Mean	Median	Std.Dev.	N	Diff.	p-value
Number of bids	3.9	3.0	4.0	54,582	3.7	3.0	3.3	18,691	0.2	0.0000
Duration in months	38	30	40	13,381	40	36	44	6,826	-2	0.0100
Contract value	1,800	750	5,798	54,476	1,568	698	4,796	18,347	231	0.0000
Services	0.7	1.0	0.5	56,141	0.7	1.0	0.5	18,759	0.0	0.3200
Supplies	0.2	0.0	0.4	56,141	0.2	0.0	0.4	18,759	0.0	0.0000
Works	0.1	0.0	0.3	56,141	0.1	0.0	0.3	18,759	0.0	0.0000

Notes: This table presents characteristics of contracts including number of bids, duration of the contract, imputed contract value, and type of tender. Unlike table 1 this table shows all contracts without restricting entry events, Panel A for all contracts and Panel B for competitive contracts.

According to the sectoral distribution of contracts, shown in Table A2, in general entry events the majority of contracts are awarded in business services, which account for 30.8% of contracts, followed by construction with 20%, and IT services with 13.7%. In competitive entry events, construction accounts for 23% of contracts, followed by IT services with 19%, and business services with 18%.

[13] $0.6(\text{LowestBid}) + 0.4(\text{HighestBid})$

Table A2. Sectoral distribution of contracts

	All Contracts		General Entry		Competitive Entry	
Variable	N	Percent	N	Percent	N	Percent
Agriculture, Electricity	3,274	5.83	170	4.01	72	6.58
Business services	16,246	28.94	1,304	30.79	197	17.99
Construction	11,164	19.89	849	20.05	254	23.20
Education, Health, RD	2,774	4.94	267	6.30	74	6.76
Financial and Insurance Activities	1,469	2.62	50	1.18	12	1.10
IT Services, Communication	5,635	10.04	582	13.74	207	18.90
Manufacturing	9,618	17.13	576	13.60	150	13.70
Other Service Activities	1,300	2.32	129	3.05	28	2.56
Public Administration and Defence	1,058	1.88	68	1.61	23	2.10
Water Supply, Sewerage, Waste Management	3,255	5.80	212	5.01	72	6.58
Wholesale and Retail Trade	348	0.62	28	0.66	6	0.55
Total	56,141	100.00	4,235	100.00	1,095	100.00

Notes: This table provides the distribution of contracts awarded in the Netherlands above European thresholds across sectors defined by CPV codes for all contracts, for contracts awarded in general entry, and for contracts awarded in competitive entry.

B Details firm's balance sheet information

The Orbis global database, from Bureau van Dijk (BvD) a Moody's Analytics company is a cross country database with firm level balance sheet information. The dataset offers good information for building a nationally representative panel (Kalemli-Ozcan et al., 2015), identifying firms with state participation (Dall-Olio et al., 2022), and estimating Total Factor Productivity at the firm and national levels (Gal, 2013). However, Orbis has an unbalanced yearly coverage (Bajgar et al., 2020), I find that in the Netherlands 13% of the firms have detailed financial and investment information, 28% have limited financial reports, and 49% do not have information[14]. I extracted information for nine financial variables from the balance sheet, as well as firms characteristics. Some of the key variables are the following:

- Balance sheet information: assets, liabilities, equity, and revenue.
- Number of employees
- Firms' year of incorporation
- Firms' sector NACE

A challenge arises from the structure of the financial data. In particular, firms do not report financial statements every year, resulting in an unbalanced panel. Consequently, for a subset of firms, the time series of financial outcomes contains gaps that complicate the

[14]From the total data, 66.5% have *Limited Financials*. According to Moodys this implies 'The information available for such companies is often based on rounded figures, or class level, officially available (sometimes also collected from other directories or web sites). In most cases only the number of employees and the Operating Revenue are available.'

identification of dynamic effects around the event of interest. For some financial variables. such as profit and sales, the number of usable firm-year observations falls below what would be ideal to obtain precise point estimates and tighter confidence intervals. Therefore, I focus on financial variables such as assets, shareholder funds, liabilities, current ratio, and number of employees to guarantee a stronger empirical power of the event study design.

C Matching Algorithm

I begin by constructing baseline cohort samples using the general definition of entry. Specifically, for each entry year $g \in \{2017, \ldots, 2024\}$, I retain firms that first enter procurement in year g, and firms that never participate, which serve as controls. I exclude firms with non-treated procurement activity under this definition and define treatment based on the indicator of entry event. All variables are measured in the year prior to entry $(g-1)$, aiming for a pre-treatment baseline. Each cohort dataset contains one observation per firm and includes sector, firm's size, age, and baseline outcomes of the balance sheet information. I do this separately for general entry events and competitive entry events.

I estimate propensity scores separately for each cohort using a logistic regression model of treatment on time-invariant firm characteristics. Specifically, for each entry year g, I regress the treatment indicator on firm age, sector fixed effects, and size categories, using only variables measured in the baseline year $(g-1)$. This procedure is implemented for both definitions of entry. First, I estimate propensity scores for the broad general entry definition, where treatment corresponds to any procurement participation. Second, I repeat the estimation using the more restrictive definition of entry into competitive procurement.

After estimating the propensity scores, I construct matching samples by keeping the observations used in the logistic regression. For each cohort, I align the baseline outcome, the treatment indicator, and the estimated propensity score. I then remove any remaining observations with missing values to ensure consistency across variables. This procedure yields clean vectors and corresponding indices that are used in the subsequent matching analysis.

I implement matching based on the estimated propensity score. I follow and use the package developed by Sekhon (2011). Defining the propensity score as $e(X_i) = \Pr(T_i = 1 \mid X_i)$ from the logistic regression, the matching is performed by pairing each treated firm with the control firm whose estimated propensity score is closest, thereby conditioning on a one-dimensional summary of the covariates. Formally, for each treated unit i, I select the control unit j such that, for each treated firm i with $T_i = 1$, I select the control firm j with $T_j = 0$ whose propensity score is closest to that of firm i, $j(i) = \arg\min_{j:T_j=0} |\hat{e}(X_i) - \hat{e}(X_j)|$. In practice I implement a one nearest neighbor $(M = 1)$ with ties randomly broken.

This approach follows the standard propensity score matching framework, which ensures that, under unconfoundedness, treated and control units are comparable in terms of observed

characteristics. I aggregate these cohort-specific matched datasets into a single matched sample for each definition of entry: general and competitive, ensuring that each firm appears only once where appropriate. Finally, I merge the matched firm identifiers back into the full firm-level panel. This step recovers the complete longitudinal history of the matched treated and control firms, rather than only their baseline observations. I verify that the matched firm list does not contain duplicate identifiers before constructing the final panel. The resulting matched panel is then used to estimate the event-study specifications.

C.1 All contracts and complete staggered entry

Table C1 reports the annual number of public procurement contracts awarded above the European procurement thresholds. The column All includes 68,531 awarded contracts between 2016 and 2024,[15] while the column 1 Lot includes 56,141 contracts awarded without lot division. The table provides a benchmark for the number of available entry events under the general-entry and competitive-entry definitions, and for the number of events retained in the final sample after matching entrants to never-supplier firms and estimating the event-study specifications.

Table C1. Sample restrictions and staggered events

	Awarded Contracts		General Entry				Competitive Entry			
Year	All	1 Lot	Events	Staggered	Events In Sample	Staggered In Sample	Events	Staggered	Events In Sample	Staggered In Sample
2016	2,355	1,835								
2017	5,813	4,698	2,618	2,618	859	859	712	712	234	234
2018	6,951	5,618	1,939	4,557	629	1,488	613	1,325	196	430
2019	7,293	5,971	1,771	6,328	528	2,016	429	1,754	131	561
2020	7,724	6,205	1,646	7,974	505	2,521	457	2,211	155	716
2021	8,507	6,876	1,524	9,498	437	2,958	330	2,541	106	822
2022	10,061	8,363	1,801	11,299	511	3,469	334	2,875	115	937
2023	10,000	8,397	1,624	12,923	520	3,989	308	3,183	109	1,046
2024	9,827	8,178	1,788	14,711	246	4,235	179	3,362	49	1,095
Total	68,531	56,141	14,711		4,235		3,362		1,095	5,841

s

Notes: This table presents the staggered entry of firms in the public procurement market. The columns awarded contracts present all awarded contracts as observed in the TenderNed platform. The column 1 lot indicates a sample restriction of keeping tenders without lot division. The columns events indicate the observed first time contracts of firms and in sample restricts the analysis to firms observed in the financial panel data.

[15] Public information from TenderNed reports a total of 78,950 awarded contracts from 2017. See Aanbestedingsmonitor 2017–2025.

D First Contracts Test

The empirical analysis of this paper relies on identifying the first contract won by a firm to define entry into the public procurement market. I provide suggestive evidence indicating that the first contract is more important than subsequent contracts. As shown in equation D1, I test whether the first contract is significantly associated with financial outcomes of entrants, captured by β_1. The test is conditional on year τ_t, sector ψ_s, buyer ϕ_B, and firm ζ_i fixed effects.

$$y_{it} = \beta_1 \text{FirstContract}_{it} + \beta_2 \text{SecondContract}_{it} + \psi_s + \tau_t + \phi_B + \zeta_i + \varepsilon_{it} \tag{D1}$$

I test the hypothesis that the effect of the first contract is statistically different from zero: $H_0 : \beta_1 = 0 \; ; H_1 : \beta_1 \neq 0$. Rejecting $H_0 : \beta_1 = 0$ suggests that the first contract is more strongly associated with financial outcomes than later contracts, evidence consistent with the approach of using the first contract won as entry in the market that affects financial outcomes. The regression test also includes an indicator variable for the second contract to test the statistical significance of β_2, with the hypothesis that $H_0 : \beta_2 = 0 \; ; H_1 : \beta_2 \neq 0$. In this case, failing to reject the null hypothesis, $H_0 : \beta_2 = 0$, makes a stronger case for the importance of the first contract.

Table D1. Test Relevance of the First Contract

Model:	Assets Growth (1)	Liabilities EUR (2)	Current Ratio (3)	Assets EUR (4)	Liabilities Growth (5)	Solvency (6)	Shareholder EUR (7)	Employee (8)	Employee Growth (9)
Variables									
First Contract	-0.0030	113,345.7***	-0.1833***	175,145.1***	0.0138	-1.861***	22,851.2	-0.4599	-0.0387***
	(0.0125)	(16,549.7)	(0.0659)	(27,311.8)	(0.0161)	(0.4644)	(15,200.7)	(0.3302)	(0.0140)
Second Contract	-0.0106	24,585.5*	-0.0472	31,384.5	-0.0209	-0.2856	7,965.6	-0.4067	-0.0146
	(0.0105)	(13,788.8)	(0.0553)	(22,828.9)	(0.0134)	(0.3897)	(12,713.3)	(0.2741)	(0.0117)
Fixed-effects									
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CPV 2-digits	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Buyer	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,539	14,204	16,434	15,339	14,187	16,298	15,620	11,598	11,598
Pseudo R^2	0.83426	0.06510	0.27950	0.07035	0.73244	0.18139	0.06588	0.26503	0.88838

Notes: This table presents OLS estimations of equation D1. Standard errors in parentheses. Significance levels: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

The results of the test are shown in Table D1. For these estimations, I use only the pooled sample of firms with public procurement contracts. The first row shows the estimates of β_1 for the nine financial variables of interest. The statistical significance displayed by the p-value stars indicates that the first contract is statistically significant in five financial outcomes. In contrast, the coefficient of the second contract indicator is not statistically different from zero. Therefore, these results provide suggestive evidence indicating that the first contract is more strongly associated with financial outcomes than subsequent contracts.

E Estimation tables

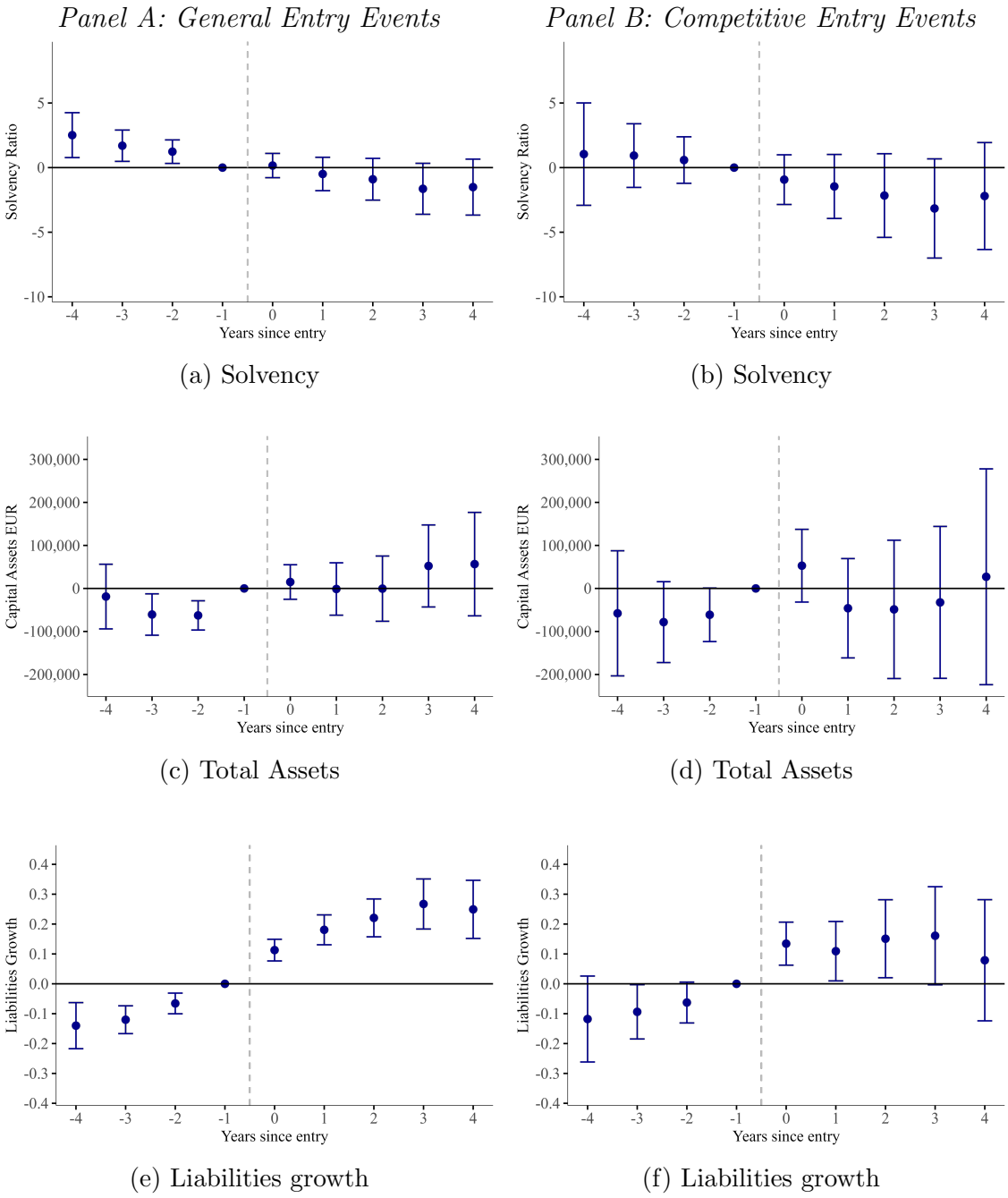
This section presents the second part of estimation tables for the main event study estimations for general entry event and competitive entry event in table E1. This second part corresponds to the remaining dependent variables: solvency, shareholder funds, number of employees, and employment growth.

Table E1. Event Study Estimates Financial Performance (Part 2)

	Panel A: General Entry Event				Panel B: Competitive Entry Event			
Event	Solvency	Shareholder	Employee	Ln Employee	Solvency	Shareholder	Employee	Ln Employee
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
5 years before entry	2.353	84,500.282*	-0.980	-0.002	3.232	96,372.139	-0.369	0.088
	(0.908)	(19,032.007)	(0.456)	(0.032)	(1.990)	(40,862.276)	(0.971)	(0.065)
4 years before entry	2.513*	70,744.342*	-0.416	0.041	1.044	48,102.051	-0.143	0.056
	(0.623)	(13,883.595)	(0.369)	(0.028)	(1.411)	(29,997.880)	(0.740)	(0.051)
3 years before entry	1.694*	33,263.133*	-0.615	0.027	0.931	19,325.002	0.094	0.084
	(0.434)	(8,507.272)	(0.272)	(0.020)	(0.877)	(17,671.290)	(0.515)	(0.034)
2 years before entry	1.234*	23,784.965*	-0.360	0.018	0.584	20,869.953	0.353	0.047
	(0.326)	(6,783.719)	(0.230)	(0.015)	(0.641)	(11,784.432)	(0.406)	(0.030)
Year of entry	0.160	18,340.010	0.114	0.020	-0.931	18,034.212	0.362	0.032
	(0.337)	(7,299.621)	(0.239)	(0.017)	(0.685)	(15,755.654)	(0.473)	(0.029)
1 year after entry	-0.494	19,447.391	0.319	-0.001	-1.459	-9,072.905	0.335	-0.014
	(0.463)	(11,480.974)	(0.324)	(0.019)	(0.882)	(22,767.946)	(0.586)	(0.035)
2 years after entry	-0.901	-1,031.977	0.324	-0.025	-2.164	-37,861.180	0.793	0.001
	(0.579)	(13,972.311)	(0.367)	(0.025)	(1.153)	(25,660.320)	(0.745)	(0.044)
3 years after entry	-1.640	-5,646.098	0.714	-0.024	-3.162	-34,020.320	0.806	-0.019
	(0.707)	(18,959.244)	(0.449)	(0.030)	(1.367)	(37,756.529)	(0.870)	(0.055)
4 years after entry	-1.510	11,136.842	0.193	-0.089	-2.201	-19,394.085	0.346	-0.106
	(0.776)	(24,637.740)	(0.558)	(0.035)	(1.474)	(47,556.658)	(1.047)	(0.070)
5 years after entry	-2.519	-16,287.526	0.028	-0.129*	-4.876*	-83,626.498	1.403	-0.069
	(0.922)	(28,673.184)	(0.704)	(0.042)	(1.641)	(52,686.095)	(1.347)	(0.080)
Observations	13,345	13,351	10,296	10,296	3,325	3,311	2,596	2,596
Cohorts	8	8	8	8	8	8	8	8
Years	13	13	13	13	13	13	13	13

Notes: This table presents the estimations of event studies using Callaway and Sant'Anna estimator. Panel A presents the estimations for general entry events and Panel B for competitive entry events. Cohorts are defined by year of entry in the public procurement market: the first year in which the firm was awarded a contract by a public entity. The comparison group corresponds to matched never suppliers. Standard errors are presented in parenthesis and clustered at firm level.

Figure E1. Event Study Plots Financial Performance - Part 2



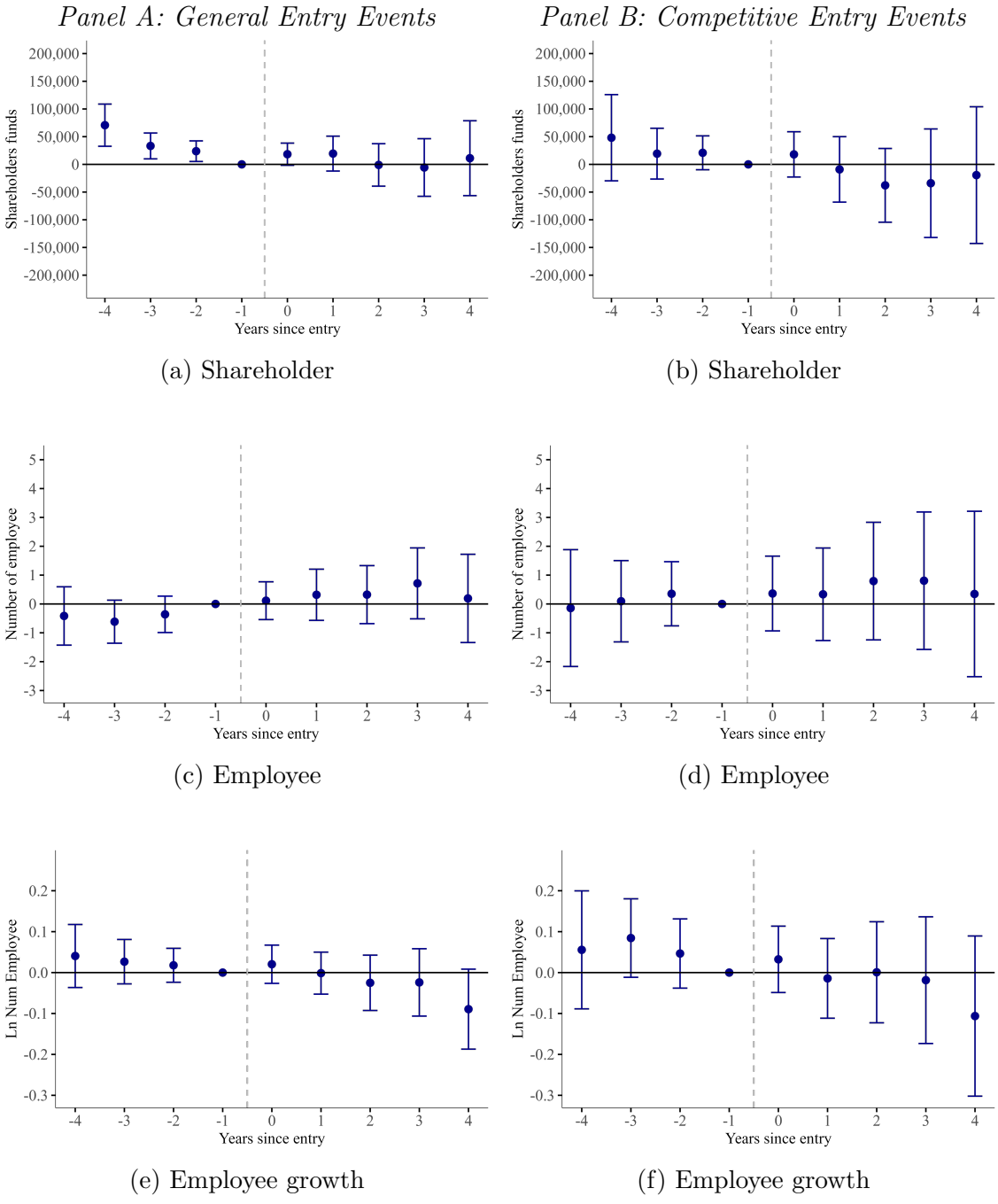
(a) Solvency (b) Solvency

(c) Total Assets (d) Total Assets

(e) Liabilities growth (f) Liabilities growth

Notes: Figure E1 plots the estimated event-study coefficients, $\hat{\gamma}$, from equation 3. Panel A presents results for general entry, while Panel B reports results for competitive entry. Sub-panels (a) and (b) display estimates for solvency (Columns 1 and 5 of Table 3); (c) and (d) for total assets (Columns 2 and 6 of Table 3); (e) and (f) for Liabilities growth (Columns 4 and 9 of Table 3).

Figure E2. Event Study Plots Financial Performance - Part 3



(a) Shareholder (b) Shareholder

(c) Employee (d) Employee

(e) Employee growth (f) Employee growth

Notes: Figure E1 plots the estimated event-study coefficients, $\hat{\gamma}$, from equation 3. Panel A presents results for general entry, while Panel B reports results for competitive entry. Sub-panels (a) and (b) display estimates for shareholders funds (Columns 2 and 6 of Table E1); (c) and (d) for number of employees (Columns 3 and 7 of Table E1); and (e) and (f) for employee growth (Columns 4 and 8 of Table E1).

As a benchmark, I also aggregate the estimates of $\widehat{\gamma}^{CS}(g,t)$ across post-entry years to obtain the overall change. The Callaway-Sant'Anna estimator first estimates cohort-specific treatment effects for each group of firms that enters the procurement market in year g and each calendar year t, comparing their outcome changes to an untreated comparison group such as never-supplier firms. These group-time effects are then aggregated by relative event time $e = t - g$ to obtain dynamic event-study estimates that allow treatment effects to vary across cohorts and over time since entry. The goal is to add to the discussion of whether entering a procurement market has persistent effects.

Table E2. Overall Coefficients

	Current ratio	Solvency	Shareholders	Total Assets	Ln Assets	Employee	Ln Employee	Liabilities	Ln Liabilities
General Entry									
Overall ATT	-0.873*	-1.151	4,326.441	28,064.566	0.099*	0.282	-0.041	97,975.141*	0.223*
Std. Error	(0.154)	(0.491)	(13,425.796)	(25,709.455)	(0.017)	(0.331)	(0.022)	(13,079.157)	(0.022)
Observations	13258	13345	13351	13445	13445	10296	10296	13245	13205
Cohorts	8	8	8	8	8	8	8	8	8
Years	13	13	13	13	13	13	13	13	13
Competitive Entry									
Overall ATT	-0.489	-2.466	-27,656.796	2,033.141	0.025	0.674	-0.029	71,887.188*	0.135*
Std. Error	(0.260)	(0.913)	(25,235.989)	(51,266.068)	(0.032)	(0.705)	(0.043)	(23,704.665)	(0.046)
Observations	3305	3325	3311	3348	3348	2596	2596	3278	3263
Cohorts	8	8	8	8	8	8	8	8	8
Years	13	13	13	13	13	13	13	13	13

Notes: The table presents the aggregation of the event studies estimations using the Callaway and Sant'Anna estimator. The Section on the top presents the estimations for general entry events and Section on the bottom for competitive entry events.

E.1 Firm Heterogeneity

In this section, I present in more detail the heterogeneity estimations by firm type. I define three types of firms: (i) short-term participants that are observed as active only in the year of entry; (ii) capacity constrained firms that are active in the procurement market in the year of entry and in subsequent years, but whose participation is intermittent, exhibiting gaps over time; and (iii) established firms that enter the market and remain continuously active in subsequent years, with no observable interruptions in participation[16].

Table E3. Firm Heterogeneity Characteristics

	Short-term participants				Capacity constrained				Established firms			
Variable	Mean	Median	Std.Dev.	N	Mean	Median	Std.Dev.	N	Mean	Median	Std.Dev.	N
General Entry												
Firms characteristics												
Small	0.61	1.00	0.49	3,675	0.42	0.00	0.49	2,629	0.37	0.00	0.48	454
Medium	0.37	0.00	0.48	3,675	0.54	1.00	0.50	2,629	0.56	1.00	0.50	454
Large	0.02	0.00	0.14	3,675	0.04	0.00	0.20	2,629	0.07	0.00	0.25	454
Firm age (years)	18.46	14.00	13.95	3,675	22.46	18.00	16.26	2,629	16.95	12.00	13.41	454
Sector construction	0.08	0.00	0.27	3,675	0.09	0.00	0.29	2,629	0.08	0.00	0.27	454
Sector manufacturing	0.04	0.00	0.20	3,675	0.04	0.00	0.19	2,629	0.05	0.00	0.22	454
Sector other activities	0.03	0.00	0.16	3,675	0.02	0.00	0.15	2,629	0.03	0.00	0.18	454
Sector services	0.85	1.00	0.36	3,675	0.85	1.00	0.36	2,629	0.84	1.00	0.37	454
Contracts characteristics												
Number of tenders	1.12	1.00	0.45	3,675	4.83	3.00	5.11	2,629	14.39	8.00	19.03	454
Number of lowest price	0.23	0.00	0.44	3,675	1.01	0.00	1.57	2,629	2.53	1.00	4.38	454
Contract duration (months)	39.06	28.37	52.73	523	37.38	30.58	27.30	943	35.44	30.37	24.55	210
Contract value (Thousand Euro)	1 233.99	750.00	3 766.03	1,977	1 350.84	697.96	2 602.17	2,038	1 359.64	691.76	2 821.91	393
Competitive Entry												
Firms characteristics												
Small	0.57	1.00	0.50	824	0.40	0.00	0.49	732	0.26	0.00	0.44	119
Medium	0.42	0.00	0.49	824	0.55	1.00	0.50	732	0.66	1.00	0.48	119
Large	0.02	0.00	0.13	824	0.05	0.00	0.21	732	0.08	0.00	0.28	119
Firm age (years)	19.69	16.00	14.61	824	23.12	19.00	16.20	732	19.06	15.00	14.42	119
Sector construction	0.10	0.00	0.31	824	0.12	0.00	0.33	732	0.08	0.00	0.27	119
Sector manufacturing	0.04	0.00	0.20	824	0.03	0.00	0.17	732	0.08	0.00	0.28	119
Sector other activities	0.04	0.00	0.19	824	0.03	0.00	0.17	732	0.04	0.00	0.20	119
Sector services	0.81	1.00	0.39	824	0.82	1.00	0.39	732	0.80	1.00	0.40	119
Contracts characteristics												
Number of tenders	1.10	1.00	0.39	824	4.77	3.00	4.21	732	11.84	9.00	11.89	119
Number of lowest price	0.75	1.00	0.51	824	1.97	2.00	1.95	732	4.80	3.00	5.98	119
Contract duration (months)	36.95	34.00	30.59	212	37.63	30.96	30.45	359	40.24	33.95	31.63	77
Contract value (Thousand Euro)	1 036.18	585.60	2 472.98	508	1 339.21	666.29	2 626.68	639	1 333.50	750.00	2 142.92	114

Notes: The table reports summary statistics for firm characteristics across three groups of firms: short-term participants, capacity constrained firms, and established firms. The top section reports firms in general entry events. The bottom section reports firms in competitive entry events.

Table E3 presents descriptive statistics for the firms and for the contracts awarded to them. The top section of the table reports summary statistics for firms in general entry events and the bottom section for firms in competitive entry events. In terms of size, short-term participants are predominantly small firms, whereas capacity-constrained firms are more evenly split between small and medium-sized firms, and established firms are primarily medium-sized with a somewhat larger share of large firms. In terms of age, capacity-constrained firms

[16]The analysis focuses on firms that enter the market; therefore, I do not consider incumbents or firms whose year of entry is not observed in the data. For reference, these incumbents are large firms that have been incorporated for 25 years on average, and are awarded around 45 contracts between 2016 and 2024.

are the oldest on average, followed by short-term participants, while established firms are somewhat younger, though differences across groups are moderate. All three types are heavily concentrated in the services sector (around 80 to 85%), with construction, manufacturing, and other activities representing small and broadly comparable shares.

In terms of the characteristics of the contracts they are awarded, established firms win more tenders than the other groups, averaging 14, followed by capacity-constrained firms, with an average of 5, while short-term participants win one tender on average. Contract duration is broadly similar across groups, three years on average, suggesting that differences in firm outcomes are unlikely to reflect differences in contract length. The average value of the contracts is higher for capacity constrained and established firms, although there is substantial within-group dispersion. These patterns are mirrored under competitive entry, with relative differences across firm types remaining consistent.

Ideally, I would describe firms' sales, output, and revenue sources, the data provide limited coverage. Nonetheless, I calculate the public procurement revenue as a share of total sales revenue using a small subsample of firms with observed turnover. The goal is to understand to what extent entrant firms rely on supplying to the government for their operations. Table E4 presents the average share of public procurement revenue in total firm revenue and tests the differences in means with respect to incumbents. I find that the shares are on average 11% for established firms, 8.4% for capacity-constrained firms, and 5.2% for short-term participants. The differences with respect to incumbents are statistically significant at the 1% level for all three groups, suggesting that public procurement revenue constitutes a smaller share of total turnover for entrants compared to incumbents. This supports the idea that entrant firms are not primarily dependent on procurement revenue.

Table E4. Share of procurement revenue in total firm revenue

Type of firm	Mean	Median	Std.Dev.	N	Diff	P-value
Established firms	10.8%	2.6%	18.0%	322	-2.8%	0.0278
Capacity constrained	7.4%	1.7%	14.8%	1,566	-6.2%	0.0000
Short-term participants	5.2%	1.1%	10.3%	200	-8.4%	0.0000
Incumbents	13.6%	5.6%	19.1%	597		

Notes: The table reports summary statistics for the share of procurement revenue in total operating turnover revenue. The table shows the three types of firms: short-term participants, capacity constrained firms, and established firms; as well as incumbents. The column $Diff$ shows the differences in means between each type and incumbents.

The estimations by firm heterogeneity reveal a broadly consistent pattern in financial outcomes. Figures in E3 show that established firms exhibit increases in total assets (Column (2) of Table E5), whereas entry through competitive channels does not generate statistically significant changes in asset holdings (Column (7) of Table E5). For capacity constrained and short-term firms (Columns (2) and (7) of Table E7 and Columns (2) and (7) of Table E9, respectively), I find no statistically significant changes in asset levels.

With respect to liquidity, measured by the current ratio, general entry is associated with a decline for both established and capacity constrained firms, while no statistically significant effect is observed for short-term firms. Under competitive entry, the estimates indicate no significant changes in the current ratio across any firm type (see Figures E4). I find increases in liabilities for established and capacity constrained firms following general entry. Although the point estimates for liabilities under competitive entry are positive, they are not statistically significant. Short-term firms do not exhibit significant changes in liabilities under either form of entry (see Figures E5). Examining liability growth, the results indicate positive and statistically significant effects for all three firm types under general entry. In contrast, under competitive entry, liability growth is positive and significant for established and capacity constrained firms, but not for short-term participants (see Figures E6). Shareholder funds remain statistically unchanged across all firm types and entry modes. While the estimates for short-term participants are negative, they are not statistically distinguishable from zero (see Figures E7). The solvency ratio does not exhibit any statistically significant changes for any firm type under either form of entry (see Figures E8). Turning to employment outcomes, no significant effects are detected in the number of employees for any firm type (see Figures E9). Similarly, I find no statistically significant effects on employee growth for established and capacity constrained firms (see Figures E10), with the exception of short-term participants, for whom the estimates suggest a decline in employee growth; although they are only statistically significant in the fourth year after entry.

Table E5. Event Study Estimates Financial Performance ***Established participants*** - Part 1

	Panel A: General Entry Event					Panel B: Competitive Entry Event				
Event	Ln Assets	Assets	Current Ratio	Ln Liabilities	Liabilities	Ln Assets	Assets	Current Ratio	Ln Liabilities	Liabilities
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
5 years before entry	0.002	199,376.411	0.405	-0.837*	-267,712.794*	0.254	550,428.091	-0.276	-0.197	-251,006.298*
	(0.193)	(273,701.178)	(0.312)	(0.298)	(63,717.195)	(0.182)	(314,424.818)	(0.615)	(0.150)	(88,871.955)
4 years before entry	-0.146	-40,577.334	0.309	-0.368	-102,131.593	-0.215	-121,191.558	0.129	-0.282	-194,406.097
	(0.131)	(131,996.406)	(0.227)	(0.186)	(103,234.033)	(0.181)	(261,286.171)	(0.441)	(0.167)	(179,505.675)
3 years before entry	-0.123	-97,237.470	0.431	-0.099	-42,672.333	-0.117	-167,729.962	0.399	-0.067	-70,999.884
	(0.090)	(83,467.897)	(0.239)	(0.067)	(44,094.970)	(0.180)	(166,622.315)	(0.314)	(0.096)	(91,527.857)
2 years before entry	-0.059	-73,538.350	-0.113	-0.039	4,677.833	-0.123	-137,180.912	0.083	-0.080	-98,988.569
	(0.056)	(43,788.363)	(0.168)	(0.056)	(37,298.874)	(0.151)	(100,186.071)	(0.202)	(0.078)	(70,045.081)
Year of entry	0.169*	58,750.476	-0.373	0.257*	146,564.646*	0.154*	20,272.449	0.098	0.248*	139,001.884
	(0.034)	(55,951.696)	(0.170)	(0.042)	(35,949.396)	(0.058)	(119,999.309)	(0.209)	(0.062)	(67,567.796)
1 year after entry	0.320*	132,284.192	-0.521	0.391*	160,364.172*	0.150	31,454.983	-0.162	0.304*	134,704.330
	(0.054)	(91,424.018)	(0.259)	(0.069)	(55,430.387)	(0.080)	(160,343.391)	(0.335)	(0.101)	(98,042.689)
2 years after entry	0.317*	149,767.676	-0.714*	0.405*	184,004.684*	0.219	-9,793.463	-0.515	0.410*	260,536.246
	(0.059)	(111,414.562)	(0.278)	(0.075)	(67,939.785)	(0.088)	(211,407.638)	(0.311)	(0.117)	(117,401.862)
3 years after entry	0.397*	501,629.077*	-1.357*	0.500*	319,049.865*	0.177	104,280.482	-0.759	0.394*	320,020.407
	(0.076)	(158,564.461)	(0.334)	(0.097)	(82,361.841)	(0.095)	(234,862.588)	(0.392)	(0.140)	(121,172.855)
4 years after entry	0.461*	540,478.174*	-1.901*	0.581*	433,949.582*	0.123	43,575.548	-1.230*	0.376	186,236.786
	(0.079)	(194,273.720)	(0.347)	(0.114)	(101,255.967)	(0.116)	(288,288.719)	(0.420)	(0.159)	(161,713.505)
5 years after entry	0.416*	544,863.902	-1.913*	0.618*	540,208.567*	0.056	193,784.718	-1.324*	0.299	371,429.906
	(0.094)	(212,989.729)	(0.473)	(0.168)	(129,131.549)	(0.132)	(442,993.654)	(0.473)	(0.190)	(249,968.737)
Observations	7,141	7,141	6,959	6,968	7,002	1,792	1,792	1,750	1,728	1,742
Cohorts	7	7	7	7	7	7	7	7	7	7
Years	13	13	13	13	13	13	13	13	13	13

Notes: This table reports event-study estimates using the Callaway and Sant'Anna estimator for established firms for the first set of financial outcomes. The comparison group consists of matched never suppliers. Standard errors, in parenthesis, are clustered at firm level. Cohorts are defined by the year of entry into the public procurement market; the first year in which a firm is awarded a procurement contract. Panel A presents the estimations for general entry, while Panel B reports results for competitive entry. The outcomes are organized as follows: asset growth (Columns 1 and 6), total assets (Columns 2 and 7), current ratio (Columns 3 and 8), liabilities growth (Columns 4 and 9), and total liabilities (Columns 5 and 10).

Table E6. Event Study Estimates Financial Performance ***Established participants*** - Part 2

	Panel A: General Entry Event				Panel B: Competitive Entry Event			
Event	Solvency	Shareholder	Employee	Ln Employee	Solvency	Shareholder	Employee	Ln Employee
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
5 years before entry	1.841	7,346.612	1.184	0.182	-5.685	-289,504.533*	-0.605	0.187
	(4.663)	(76,757.707)	(1.929)	(0.117)	(4.174)	(105,790.503)	(2.804)	(0.146)
4 years before entry	4.879	-604.971	-1.393	0.055	3.405	-162,520.056	-0.404	0.058
	(2.832)	(55,791.436)	(1.483)	(0.111)	(4.499)	(133,697.512)	(2.983)	(0.176)
3 years before entry	2.473	28,901.230	0.865	0.086	5.099	28,100.487	2.572	0.150
	(1.681)	(35,145.851)	(1.174)	(0.074)	(2.645)	(62,322.936)	(2.481)	(0.127)
2 years before entry	1.549	32,056.944	0.685	0.102	3.948	132.448	0.599	0.050
	(1.177)	(25,600.163)	(0.905)	(0.060)	(2.006)	(34,194.433)	(1.737)	(0.108)
Year of entry	-1.644	44,178.628	0.745	0.101	-2.163	41,458.318	0.968	0.125
	(1.110)	(24,639.352)	(0.851)	(0.056)	(1.988)	(58,385.098)	(1.446)	(0.094)
1 year after entry	-1.666	88,984.779	2.264	0.064	-8.005	-96,336.460	5.726	0.265
	(1.648)	(43,366.401)	(1.327)	(0.068)	(3.623)	(78,656.235)	(2.707)	(0.106)
2 years after entry	-1.552	21,852.758	-0.750	-0.095	-5.843	-26,924.710	0.561	0.074
	(1.898)	(55,216.668)	(1.413)	(0.074)	(3.185)	(108,301.161)	(3.063)	(0.120)
3 years after entry	-2.609	62,974.102	1.673	-0.012	-0.862	79,963.173	-0.219	0.006
	(1.949)	(72,511.078)	(1.668)	(0.082)	(3.190)	(127,787.783)	(2.611)	(0.118)
4 years after entry	-4.399	123,890.751	2.922	-0.045	1.251	233,545.829	1.485	-0.043
	(2.343)	(91,579.342)	(1.740)	(0.088)	(3.630)	(151,220.961)	(3.353)	(0.138)
5 years after entry	-5.272	150,894.740	6.584*	0.066	-7.063	-85,644.353	5.406	0.099
	(2.572)	(101,204.977)	(2.257)	(0.097)	(4.492)	(204,303.878)	(4.106)	(0.202)
Observations	7,068	7,061	4,721	4,721	1,773	1,760	1,218	1,218
Cohorts	7	7	7	7	7	7	7	7
Years	13	13	13	13	13	13	13	13

Notes: This table reports event-study estimates using the Callaway and Sant'Anna estimator for established firms for the second set of financial outcomes. The comparison group consists of matched never suppliers. Standard errors, in parenthesis, are clustered at firm level. Cohorts are defined by the year of entry into the public procurement market; the first year in which a firm is awarded a procurement contract. Panel A presents the estimations for general entry, while Panel B reports results for competitive entry. The outcomes are organized as follows: solvency (Columns 1 and 5), shareholder funds (Columns 2 and 6), number of employees (Columns 3 and 7), and employment growth (Columns 4 and 8).

Table E7. Event Study Estimates Financial Performance ***capacity constrained firms*** - Part 1

	Panel A: General Entry Event					Panel B: Competitive Entry Event				
Event	Ln Assets	Assets	Current Ratio	Ln Liabilities	Liabilities	Ln Assets	Assets	Current Ratio	Ln Liabilities	Liabilities
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
5 years before entry	-0.046	32,848.606	-0.616	-0.149	-77,258.269	-0.029	-16,882.783	-1.653	-0.085	-70,563.249
	(0.074)	(83,832.268)	(0.344)	(0.074)	(39,803.455)	(0.152)	(138,883.581)	(0.755)	(0.133)	(68,781.587)
4 years before entry	0.001	-6,786.845	-0.173	-0.136	-18,824.517	-0.018	-39,274.902	-0.795	-0.103	-5,122.794
	(0.044)	(49,427.116)	(0.222)	(0.051)	(29,872.854)	(0.094)	(101,563.857)	(0.498)	(0.095)	(62,926.909)
3 years before entry	-0.066	-98,004.003*	-0.179	-0.110*	-37,969.380	-0.093	-131,629.836	-0.322	-0.087	-31,469.824
	(0.029)	(27,449.137)	(0.136)	(0.029)	(18,036.849)	(0.056)	(51,495.196)	(0.325)	(0.053)	(33,646.568)
2 years before entry	-0.026	-73,112.556*	-0.042	-0.060*	-26,399.938	-0.037	-66,305.135	-0.146	-0.059	-37,533.597
	(0.016)	(17,908.975)	(0.092)	(0.019)	(11,812.882)	(0.034)	(30,473.031)	(0.248)	(0.032)	(22,646.713)
Year of entry	0.100*	31,874.975	-0.231	0.136*	52,292.701*	0.093*	57,973.555	-0.109	0.138*	41,121.902
	(0.013)	(21,572.604)	(0.105)	(0.017)	(13,118.667)	(0.024)	(32,076.596)	(0.242)	(0.032)	(23,727.134)
1 year after entry	0.129*	40,073.961	-0.531*	0.198*	100,016.811*	0.060	-560.760	-0.291	0.106	62,518.617
	(0.018)	(27,703.417)	(0.120)	(0.022)	(17,314.839)	(0.030)	(52,074.551)	(0.261)	(0.044)	(31,320.910)
2 years after entry	0.127*	44,709.955	-0.736*	0.235*	97,552.049*	0.051	32,448.216	-0.556	0.142*	58,469.269
	(0.021)	(35,180.694)	(0.161)	(0.026)	(17,689.067)	(0.036)	(68,016.372)	(0.306)	(0.049)	(37,770.788)
3 years after entry	0.145*	94,117.076	-1.167*	0.289*	134,614.384*	0.046	16,201.296	-1.149*	0.199*	108,455.059
	(0.025)	(42,500.047)	(0.192)	(0.033)	(21,573.760)	(0.048)	(83,161.390)	(0.372)	(0.062)	(40,924.479)
4 years after entry	0.113*	82,214.225	-1.309*	0.260*	126,407.834*	-0.010	64,676.959	-0.894	0.108	37,879.819
	(0.032)	(53,254.306)	(0.237)	(0.044)	(26,689.253)	(0.060)	(94,531.012)	(0.466)	(0.077)	(50,914.332)
5 years after entry	0.079	57,363.953	-1.668*	0.326*	162,635.930*	-0.015	57,989.144	-1.588*	0.238	145,192.618
	(0.036)	(61,905.661)	(0.269)	(0.046)	(33,758.104)	(0.068)	(115,060.597)	(0.492)	(0.089)	(62,055.394)
Observations	9,316	9,316	9,133	9,119	9,156	2,405	2,405	2,362	2,331	2,346
Cohorts	6	6	6	6	6	6	6	6	6	6
Years	13	13	13	13	13	13	13	13	13	13

Notes: This table reports event-study estimates using the Callaway and Sant'Anna estimator for capacity constrained firms for the first set of financial outcomes. The comparison group consists of matched never suppliers. Standard errors, in parenthesis, are clustered at firm level. Cohorts are defined by the year of entry into the public procurement market; the first year in which a firm is awarded a procurement contract. Panel A presents the estimations for general entry, while Panel B reports results for competitive entry. The outcomes are organized as follows: asset growth (Columns 1 and 6), total assets (Columns 2 and 7), current ratio (Columns 3 and 8), liabilities growth (Columns 4 and 9), and total liabilities (Columns 5 and 10).

Table E8. Event Study Estimates Financial Performance ***capacity constrained firms*** - Part 2

	Panel A: General Entry Event				Panel B: Competitive Entry Event			
Event	Solvency	Shareholder	Employee	Ln Employee	Solvency	Shareholder	Employee	Ln Employee
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
5 years before entry	3.547	89,759.364	-2.591*	-0.112	5.062	154,097.956	-0.877	0.106
	(1.633)	(37,487.261)	(0.770)	(0.057)	(3.240)	(71,231.725)	(1.715)	(0.116)
4 years before entry	2.661	62,325.235	-0.370	0.030	-0.625	82,447.501	0.448	0.102
	(1.142)	(25,465.060)	(0.702)	(0.045)	(2.451)	(53,913.997)	(1.416)	(0.088)
3 years before entry	1.298	9,080.571	-0.729	0.045	0.122	4,097.337	0.227	0.128
	(0.690)	(13,590.385)	(0.409)	(0.028)	(1.335)	(23,650.769)	(0.831)	(0.050)
2 years before entry	0.901	10,944.279	-0.316	0.040	-0.440	7,625.560	0.729	0.084
	(0.483)	(9,899.044)	(0.352)	(0.021)	(0.863)	(15,743.170)	(0.672)	(0.044)
Year of entry	-0.343	16,886.473	0.806	0.052	-0.469	26,057.491	1.117	0.051
	(0.433)	(10,489.678)	(0.341)	(0.021)	(0.931)	(17,055.969)	(0.757)	(0.040)
1 year after entry	-0.818	31,278.546	1.108	0.032	-0.563	23,741.940	1.190	0.009
	(0.577)	(15,356.225)	(0.430)	(0.022)	(1.006)	(28,752.299)	(0.753)	(0.049)
2 years after entry	-0.918	27,093.052	1.282	0.031	-2.062	-7,255.527	1.713	0.068
	(0.586)	(17,280.186)	(0.476)	(0.028)	(1.266)	(31,288.993)	(0.869)	(0.048)
3 years after entry	-1.923	20,197.885	1.273	0.001	-4.529*	-15,029.162	1.703	0.035
	(0.741)	(23,245.713)	(0.550)	(0.030)	(1.373)	(42,935.009)	(0.936)	(0.055)
4 years after entry	-1.949	18,996.021	0.647	-0.059	-3.267	-27,713.867	0.660	-0.075
	(0.889)	(27,696.140)	(0.602)	(0.040)	(1.664)	(50,992.013)	(1.213)	(0.075)
5 years after entry	-3.403*	-21,801.072	-0.072	-0.139*	-6.030*	-106,529.733	1.448	-0.066
	(1.017)	(32,681.981)	(0.728)	(0.046)	(1.836)	(54,389.172)	(1.538)	(0.090)
Observations	9,239	9,231	6,766	6,766	2,385	2,371	1,782	1,782
Cohorts	6	6	6	6	6	6	6	6
Years	13	13	13	13	13	13	13	13

Notes: This table reports event-study estimates using the Callaway and Sant'Anna estimator for capacity constrained firms for the second set of financial outcomes. The comparison group consists of matched never suppliers. Standard errors, in parenthesis, are clustered at firm level. Cohorts are defined by the year of entry into the public procurement market; the first year in which a firm is awarded a procurement contract. Panel A presents the estimations for general entry, while Panel B reports results for competitive entry. The outcomes are organized as follows: solvency (Columns 1 and 5), shareholder funds (Columns 2 and 6), number of employees (Columns 3 and 7), and employment growth (Columns 4 and 8).

Table E9. Event Study Estimates Financial Performance ***Short-term participants*** - Part 1

	Panel A: General Entry Event					Panel B: Competitive Entry Event				
Event	Ln Assets	Assets	Current Ratio	Ln Liabilities	Liabilities	Ln Assets	Assets	Current Ratio	Ln Liabilities	Liabilities
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
5 years before entry	0.026	38,315.037	0.376	-0.120*	-31,536.717	0.042	79,883.957	0.359	-0.079	3,467.807
	(0.035)	(32,996.950)	(0.221)	(0.038)	(19,447.749)	(0.078)	(67,112.788)	(0.427)	(0.079)	(39,599.083)
4 years before entry	0.009	-2,909.338	0.257	-0.105*	-25,340.759	0.040	-13,335.328	-0.062	-0.078	-20,771.386
	(0.029)	(28,290.632)	(0.166)	(0.030)	(15,623.183)	(0.067)	(58,048.611)	(0.249)	(0.057)	(32,636.508)
3 years before entry	-0.022	-24,326.089	0.228	-0.121*	-40,584.344*	0.023	741.672	0.188	-0.089	-30,437.932
	(0.022)	(20,624.920)	(0.151)	(0.023)	(12,506.229)	(0.046)	(43,314.960)	(0.246)	(0.048)	(25,470.390)
2 years before entry	-0.044	-53,938.817*	0.078	-0.070*	-25,745.946	-0.046	-45,578.711	0.204	-0.060	-23,692.761
	(0.017)	(16,448.953)	(0.118)	(0.017)	(9,690.678)	(0.038)	(33,145.718)	(0.260)	(0.038)	(22,059.484)
Year of entry	0.066*	-5,704.321	-0.223	0.075*	17,927.912	0.077	50,178.608	-0.125	0.113*	29,565.437
	(0.019)	(24,296.102)	(0.137)	(0.023)	(13,435.554)	(0.034)	(53,848.969)	(0.196)	(0.042)	(30,034.445)
1 year after entry	0.056	-63,797.137	-0.320	0.127*	37,695.626	-0.003	-113,672.611	0.220	0.076	46,706.147
	(0.024)	(30,646.871)	(0.195)	(0.028)	(16,178.517)	(0.040)	(60,808.486)	(0.352)	(0.060)	(36,141.476)
2 years after entry	0.041	-86,279.789	-0.755*	0.160*	51,457.180	0.015	-183,681.914	0.236	0.099	55,271.512
	(0.031)	(45,573.363)	(0.228)	(0.040)	(24,300.056)	(0.061)	(93,315.940)	(0.475)	(0.090)	(49,780.179)
3 years after entry	-0.003	-98,716.478	-0.752	0.179*	48,883.342	-0.104	-169,631.637	0.137	0.023	22,571.078
	(0.038)	(57,694.787)	(0.312)	(0.046)	(25,832.997)	(0.075)	(110,534.190)	(0.608)	(0.089)	(54,099.750)
4 years after entry	-0.026	-103,085.700	-0.808	0.148	49,612.478	-0.118	-67,114.852	-0.297	-0.032	19,846.715
	(0.052)	(74,643.674)	(0.349)	(0.060)	(36,592.019)	(0.105)	(158,370.858)	(0.628)	(0.142)	(70,945.187)
5 years after entry	-0.094	-114,066.588	-1.059	0.178	36,256.854	-0.169	-44,625.528	0.276	-0.037	-26,264.303
	(0.066)	(87,155.892)	(0.445)	(0.077)	(44,261.034)	(0.128)	(174,483.511)	(1.030)	(0.150)	(84,862.145)
Observations	10,362	10,362	10,176	10,156	10,193	2,497	2,497	2,455	2,424	2,438
Cohorts	8	8	8	8	8	8	8	8	8	8
Years	13	13	13	13	13	13	13	13	13	13

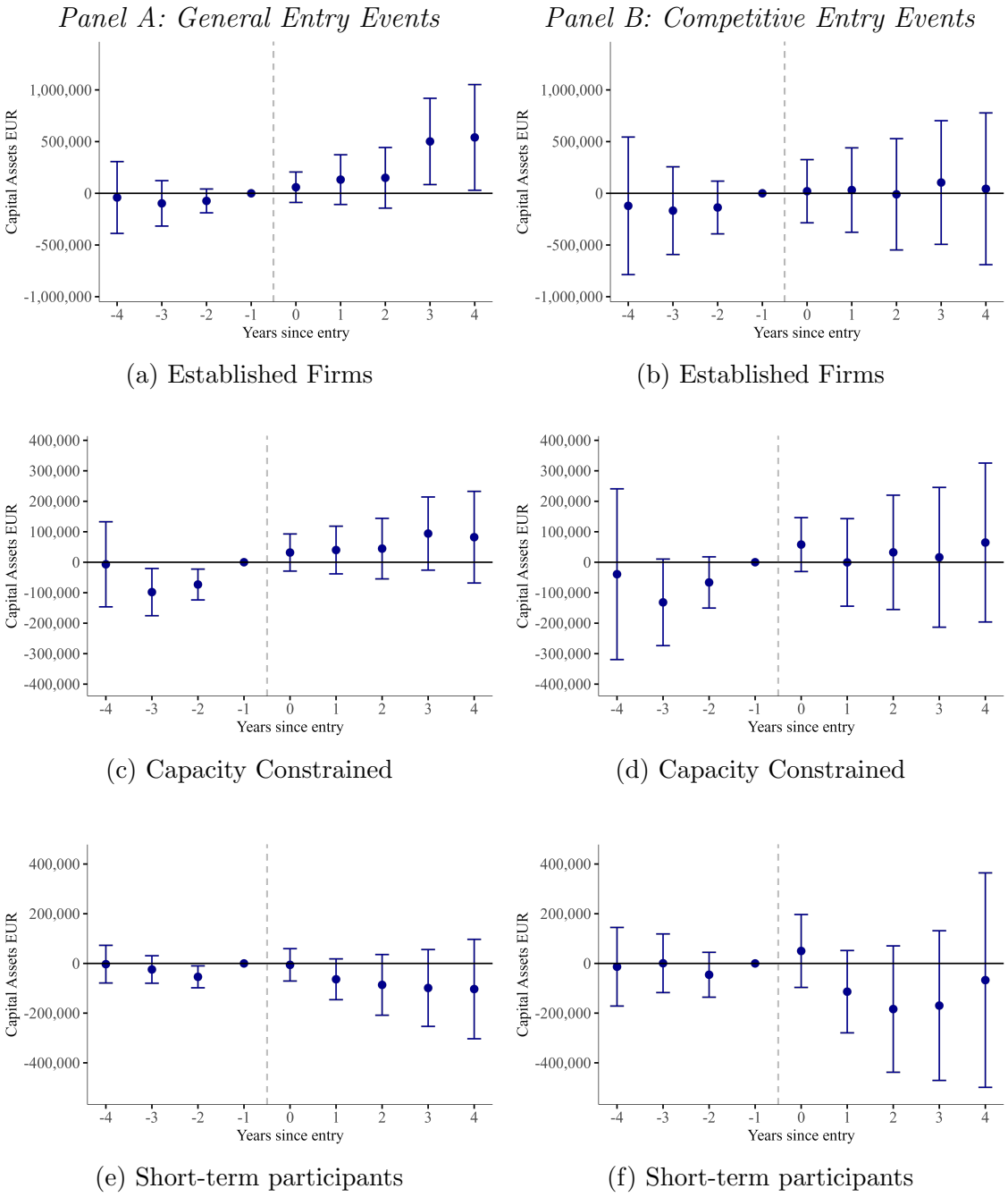
Notes: This table reports event-study estimates using the Callaway and Sant'Anna estimator for short-term participants for the first set of financial outcomes. The comparison group consists of matched never suppliers. Standard errors, in parenthesis, are clustered at firm level. Cohorts are defined by the year of entry into the public procurement market; the first year in which a firm is awarded a procurement contract. Panel A presents the estimations for general entry, while Panel B reports results for competitive entry. The outcomes are organized as follows: asset growth (Columns 1 and 6), total assets (Columns 2 and 7), current ratio (Columns 3 and 8), liabilities growth (Columns 4 and 9), and total liabilities (Columns 5 and 10).

Table E10. Event Study Estimates Financial Performance ***Short-term participants*** - Part 2

	Panel A: General Entry Event				Panel B: Competitive Entry Event			
Event	Solvency	Shareholder	Employee	Ln Employee	Solvency	Shareholder	Employee	Ln Employee
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
5 years before entry	1.813	98,883.578*	0.164	0.071	2.464	93,630.261	0.581	0.087
	(0.960)	(17,051.118)	(0.502)	(0.036)	(1.972)	(34,580.289)	(0.873)	(0.074)
4 years before entry	2.004	85,771.229*	-0.004	0.071	1.669	55,331.730	0.134	0.052
	(0.745)	(15,406.191)	(0.421)	(0.030)	(1.479)	(30,767.007)	(0.766)	(0.059)
3 years before entry	1.738*	52,065.069*	-0.506	0.018	0.876	36,601.722	0.167	0.061
	(0.603)	(12,644.420)	(0.342)	(0.026)	(1.239)	(24,548.211)	(0.659)	(0.052)
2 years before entry	1.377*	31,433.404*	-0.448	-0.005	1.030	35,520.995	0.061	0.016
	(0.494)	(8,900.925)	(0.293)	(0.021)	(1.083)	(17,680.482)	(0.623)	(0.045)
Year of entry	0.797	15,320.746	-0.605	-0.020	-1.135	5,377.786	-0.470	-0.000
	(0.534)	(11,523.056)	(0.386)	(0.025)	(1.096)	(24,813.883)	(0.646)	(0.042)
1 year after entry	0.045	-4,752.661	-1.052	-0.059	-1.216	-34,417.414	-1.830	-0.104
	(0.739)	(15,794.635)	(0.452)	(0.029)	(1.503)	(37,604.964)	(0.783)	(0.056)
2 years after entry	-0.704	-43,557.742	-1.102	-0.108	-1.399	-90,667.999	-0.948	-0.130
	(0.865)	(21,253.507)	(0.607)	(0.039)	(1.787)	(49,589.563)	(1.220)	(0.078)
3 years after entry	-0.941	-62,717.980	-0.999	-0.105	-1.144	-98,148.299	-1.713	-0.183
	(1.144)	(29,439.952)	(0.788)	(0.042)	(2.327)	(51,064.802)	(1.163)	(0.087)
4 years after entry	-0.025	-37,796.233	-2.279	-0.220*	-0.450	-64,021.333	-1.648	-0.247
	(1.333)	(36,615.232)	(0.920)	(0.063)	(2.794)	(75,612.452)	(1.482)	(0.117)
5 years after entry	0.149	-62,011.315	-2.614	-0.224*	-1.137	-68,101.655	-1.519	-0.234
	(1.642)	(43,858.739)	(1.257)	(0.070)	(3.081)	(100,733.500)	(2.289)	(0.151)
Observations	10,266	10,273	7,429	7,429	2,475	2,462	1,810	1,810
Cohorts	8	8	8	8	8	8	8	8
Years	13	13	13	13	13	13	13	13

Notes: This table reports event-study estimates using the Callaway and Sant'Anna estimator for short-term participants for the second set of financial outcomes. The comparison group consists of matched never suppliers. Standard errors, in parenthesis, are clustered at firm level. Cohorts are defined by the year of entry into the public procurement market; the first year in which a firm is awarded a procurement contract. Panel A presents the estimations for general entry, while Panel B reports results for competitive entry. The outcomes are organized as follows: solvency (Columns 1 and 5), shareholder funds (Columns 2 and 6), number of employees (Columns 3 and 7), and employment growth (Columns 4 and 8).

Figure E3. Event Study Plots Financial Performance: Assets Thousand Euro



(a) Established Firms

(b) Established Firms

(c) Capacity Constrained

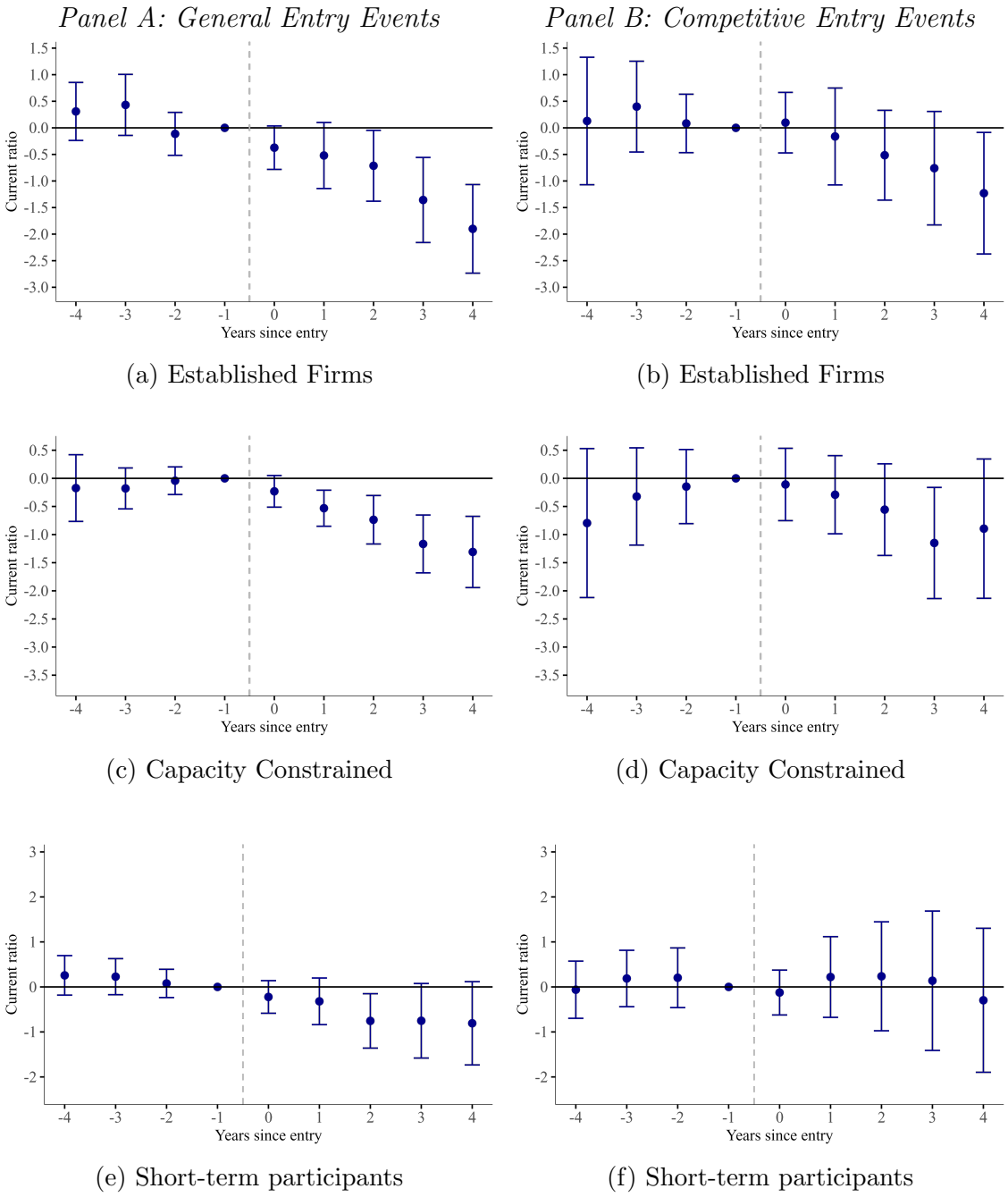
(d) Capacity Constrained

(e) Short-term participants

(f) Short-term participants

Notes: Figure E3 plots the estimated event-study coefficients, $\hat{\gamma}$, from equation 3. Panel A presents results for general entry, while Panel B reports results for competitive entry. The dependent variable is capital assets (in thousands of euros). Sub-panels (a) and (b) correspond to established firms (Columns 2 and 7 of Table E5); (c) and (d) to capacity-constrained firms (Columns 2 and 7 of Table E7); and (e) and (f) to short-term participants (Columns 2 and 7 of Table E9).

Figure E4. Event Study Plots Financial Performance: Current Ratio



(a) Established Firms

(b) Established Firms

(c) Capacity Constrained

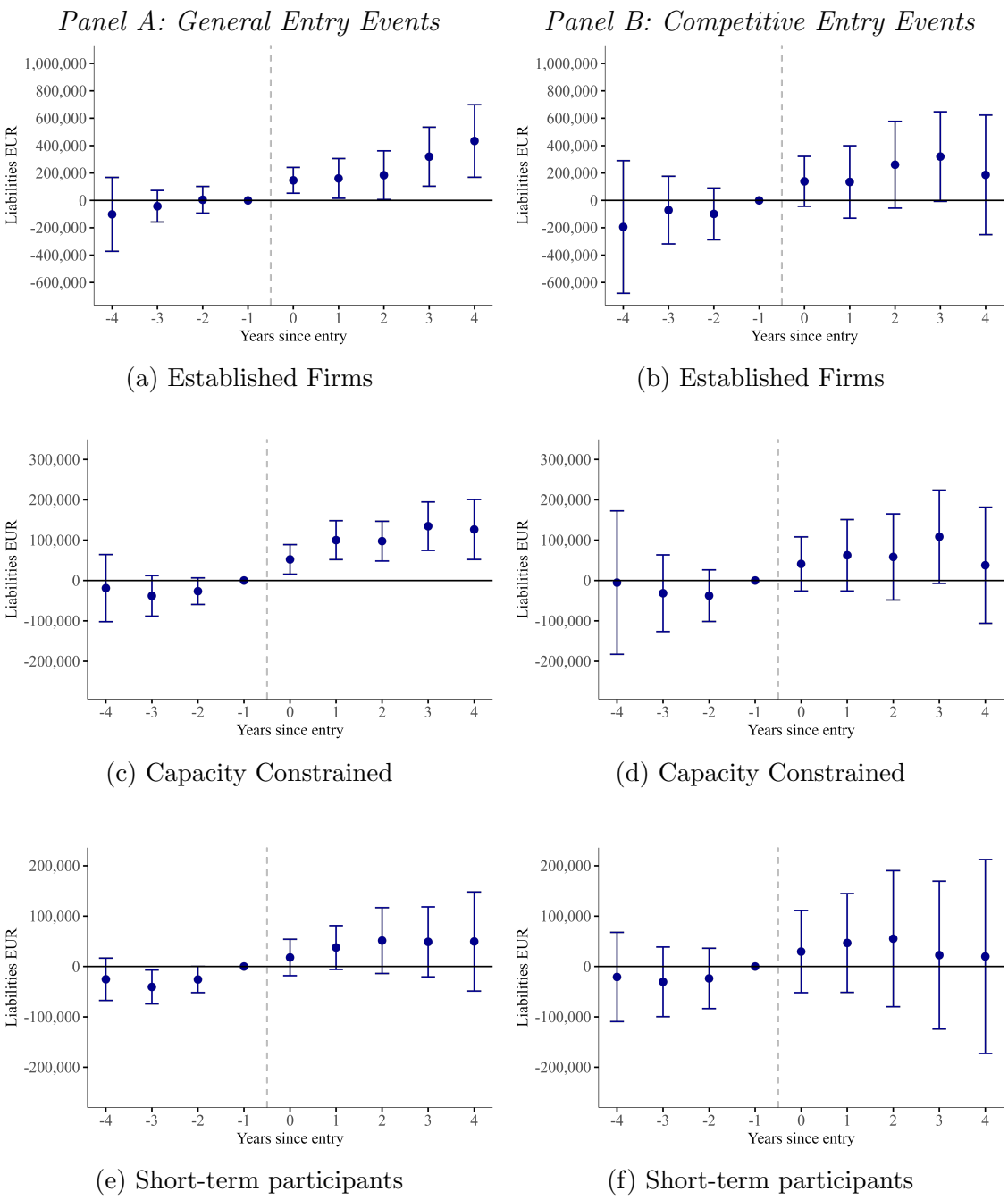
(d) Capacity Constrained

(e) Short-term participants

(f) Short-term participants

Notes: Figure E4 plots the estimated event-study coefficients, $\hat{\gamma}$, from equation 3. Panel A presents results for general entry, while Panel B reports results for competitive entry. The dependent variable is current ratio. Sub-panels (a) and (b) correspond to established firms (Columns 3 and 8 of Table E5); (c) and (d) to capacity-constrained firms (Columns 3 and 8 of Table E7); and (e) and (f) to short-term participants (Columns 3 and 8 of Table E9).

Figure E5. Event Study Plots Financial Performance: Liabilities Thousand Euro



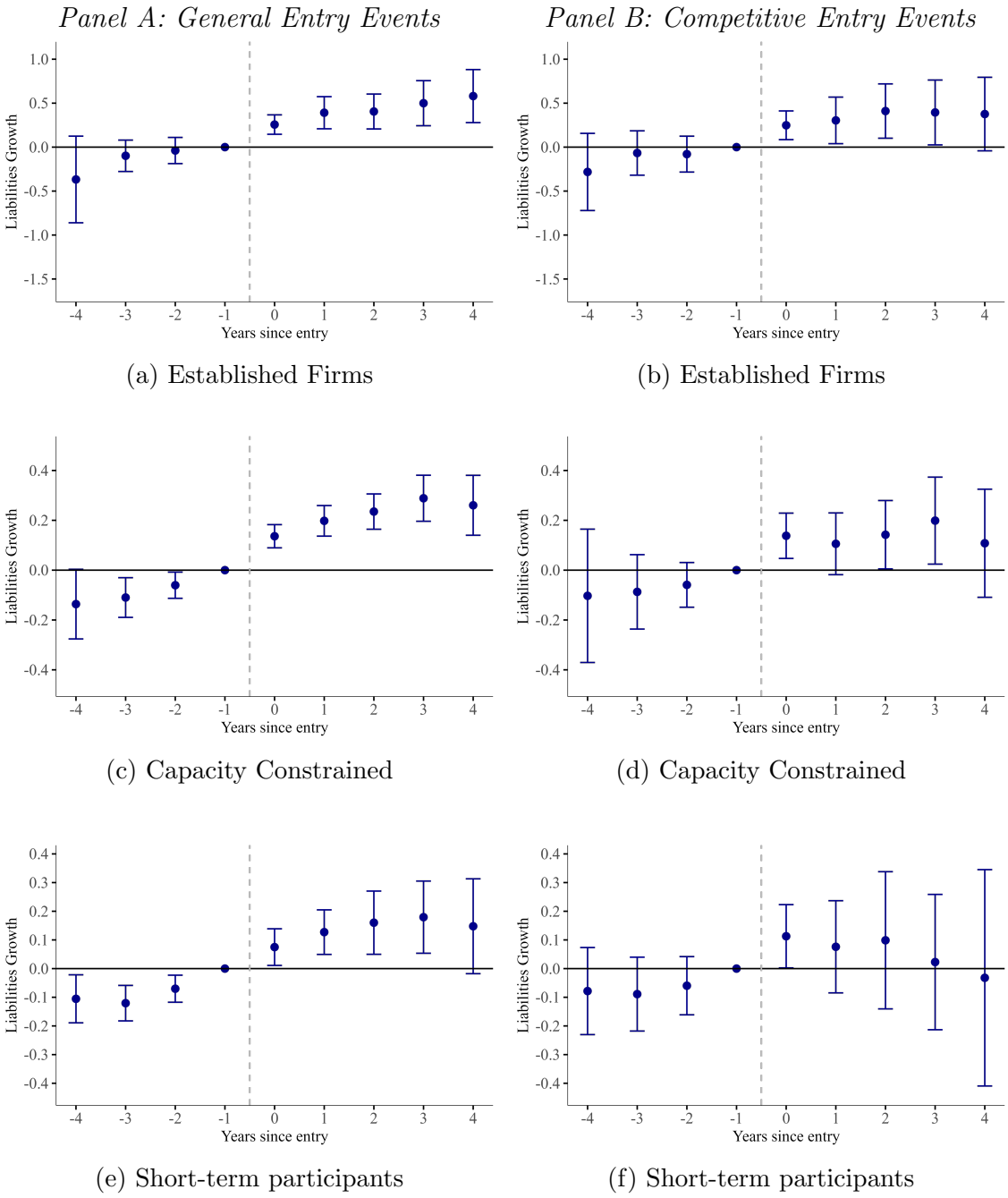
(a) Established Firms (b) Established Firms

(c) Capacity Constrained (d) Capacity Constrained

(e) Short-term participants (f) Short-term participants

Notes: Figure E5 plots the estimated event-study coefficients, $\hat{\gamma}$, from equation 3. Panel A presents results for general entry, while Panel B reports results for competitive entry. The dependent variable is liabilities in thousands of Euro. Subpanels (a) and (b) correspond to established firms (Columns 5 and 10 of Table E5); (c) and (d) to capacity-constrained firms (Columns 5 and 10 of Table E7); and (e) and (f) to short-term participants (Columns 5 and 10 of Table E9).

Figure E6. Event Study Plots Financial Performance: Liabilities Growth



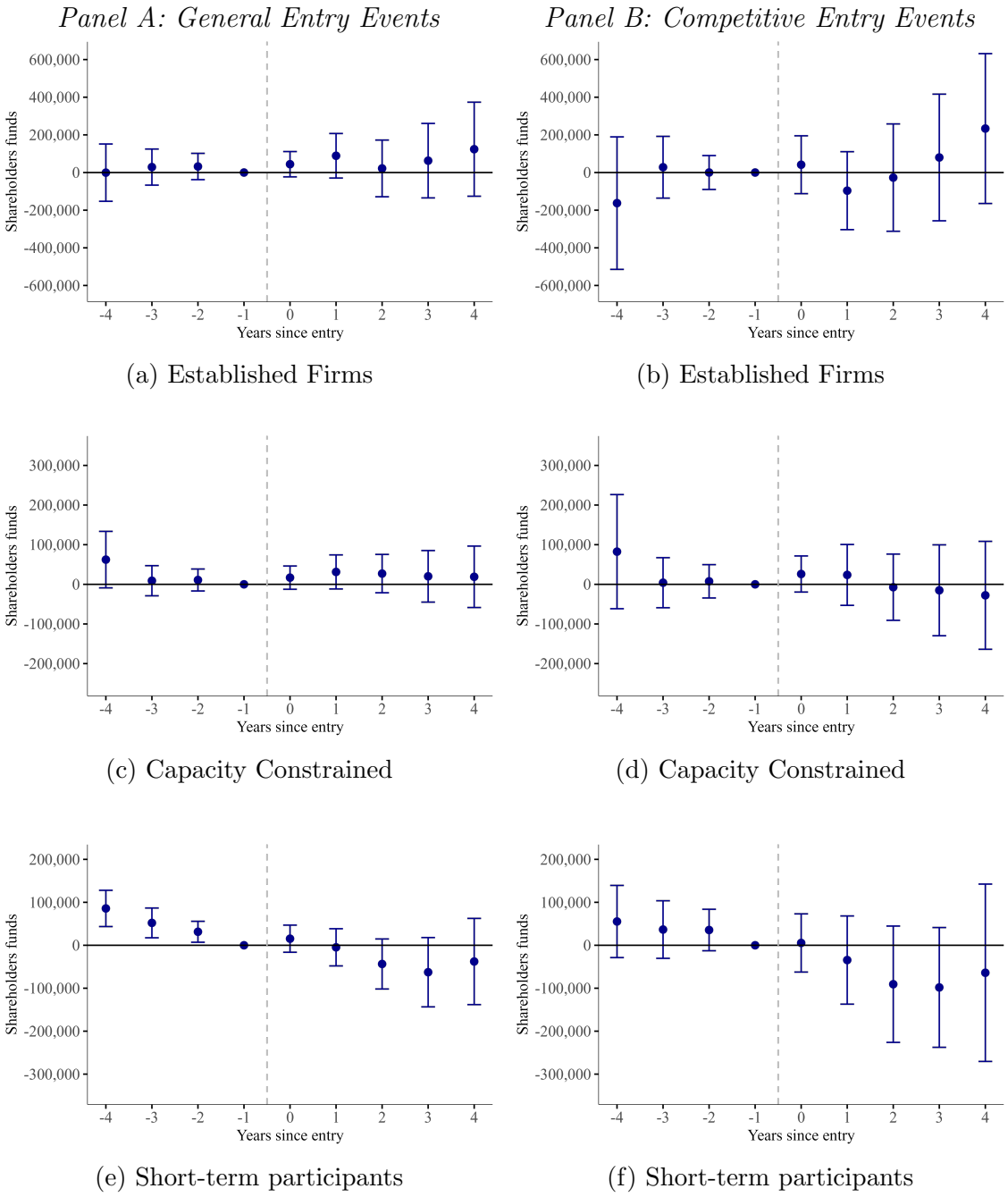
(a) Established Firms (b) Established Firms

(c) Capacity Constrained (d) Capacity Constrained

(e) Short-term participants (f) Short-term participants

Notes: Figure E6 plots the estimated event-study coefficients, $\hat{\gamma}$, from equation 3. Panel A presents results for general entry, while Panel B reports results for competitive entry. The dependent variable is liabilities growth. Sub-panels (a) and (b) correspond to established firms (Columns 4 and 9 of Table E5); (c) and (d) to capacity-constrained firms (Columns 4 and 9 of Table E7); and (e) and (f) to short-term participants (Columns 4 and 9 of Table E9).

Figure E7. Event Study Plots Financial Performance: Shareholders Funds



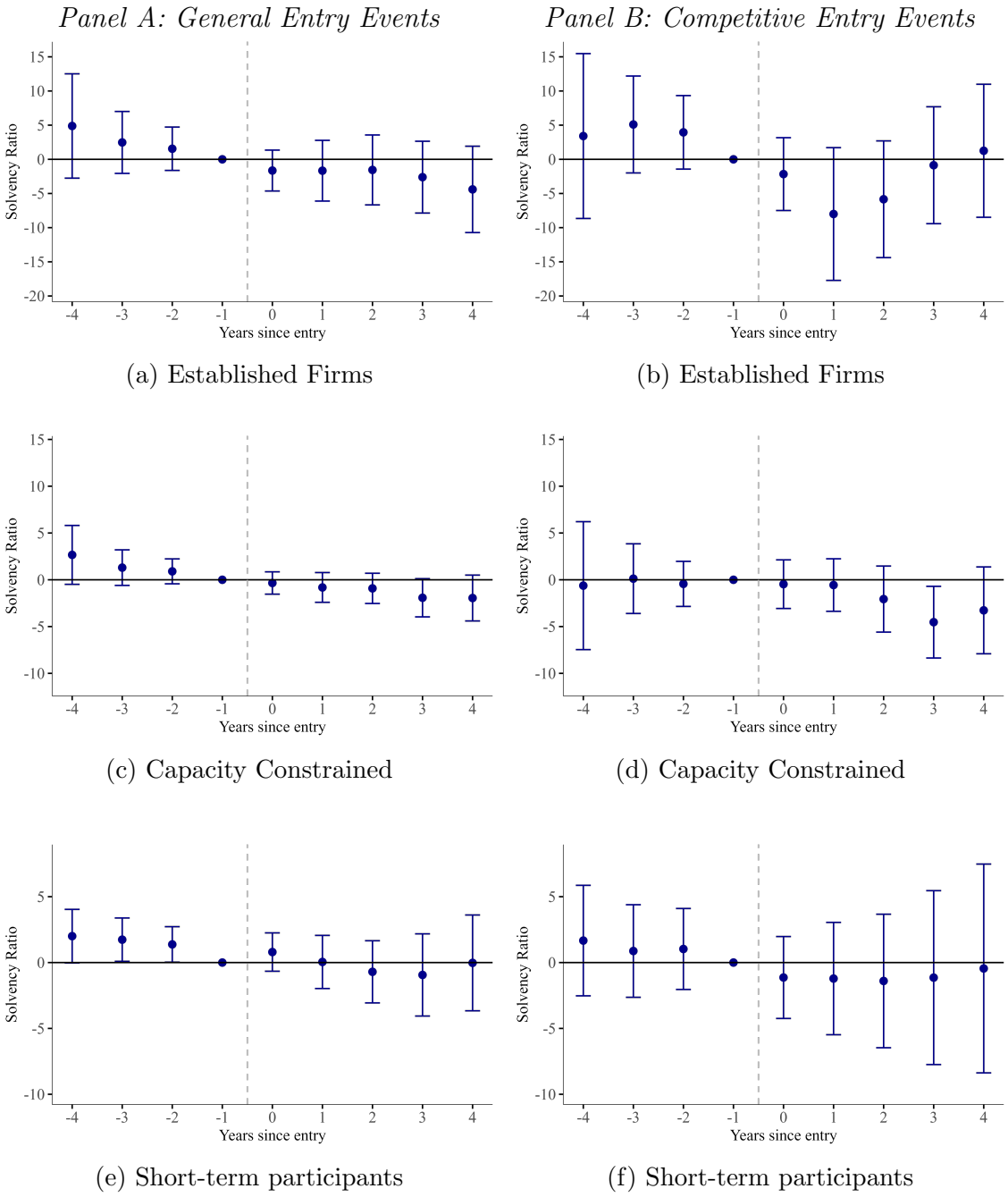
(a) Established Firms (b) Established Firms

(c) Capacity Constrained (d) Capacity Constrained

(e) Short-term participants (f) Short-term participants

Notes: Figure E7 plots the estimated event-study coefficients, $\hat{\gamma}$, from equation 3. Panel A presents results for general entry, while Panel B reports results for competitive entry. The dependent variable is liabilities growth. Sub-panels (a) and (b) correspond to established firms (Columns 2 and 6 of Table E6); (c) and (d) to capacity-constrained firms (Columns 2 and 6 of Table E8); and (e) and (f) to short-term participants (Columns 2 and 6 of Table E10).

Figure E8. Event Study Plots Financial Performance: Solvency



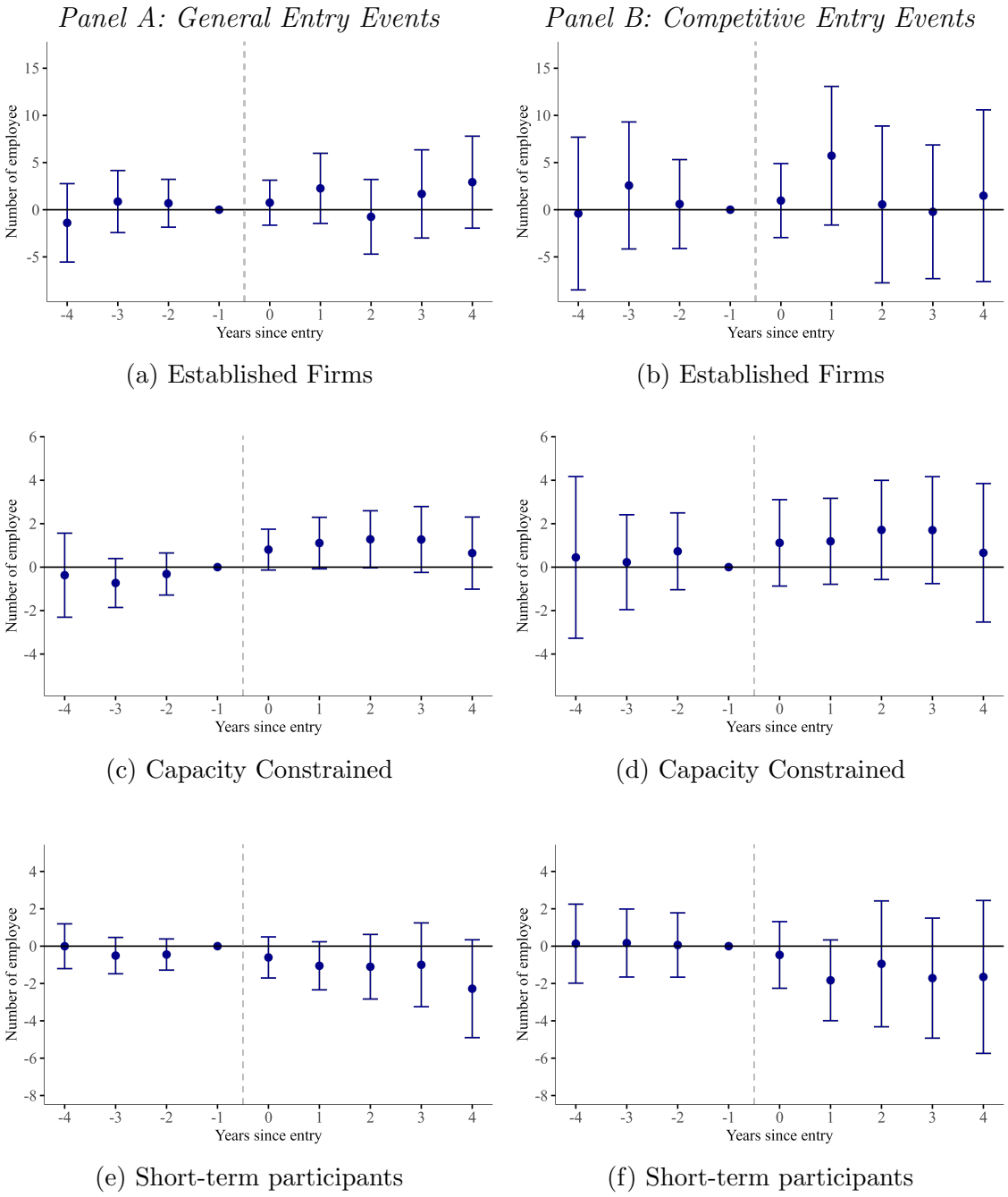
(a) Established Firms (b) Established Firms

(c) Capacity Constrained (d) Capacity Constrained

(e) Short-term participants (f) Short-term participants

Notes: Figure E8 plots the estimated event-study coefficients, $\hat{\gamma}$, from equation 3. Panel A presents results for general entry, while Panel B reports results for competitive entry. The dependent variable is liabilities growth. Sub-panels (a) and (b) correspond to established firms (Columns 1 and 5 of Table E6); (c) and (d) to capacity-constrained firms (Columns 1 and 5 of Table E8); and (e) and (f) to short-term participants (Columns 1 and 5 of Table E10).

Figure E9. Event Study Plots Financial Performance: Number of employees



(a) Established Firms (b) Established Firms

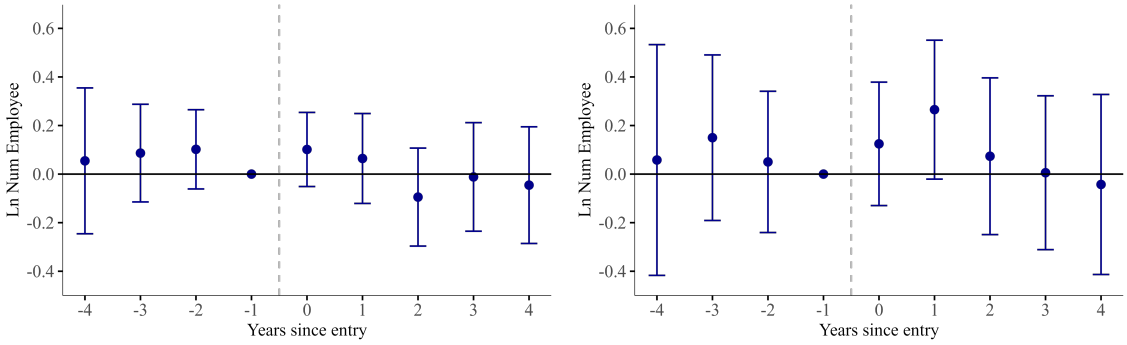
(c) Capacity Constrained (d) Capacity Constrained

(e) Short-term participants (f) Short-term participants

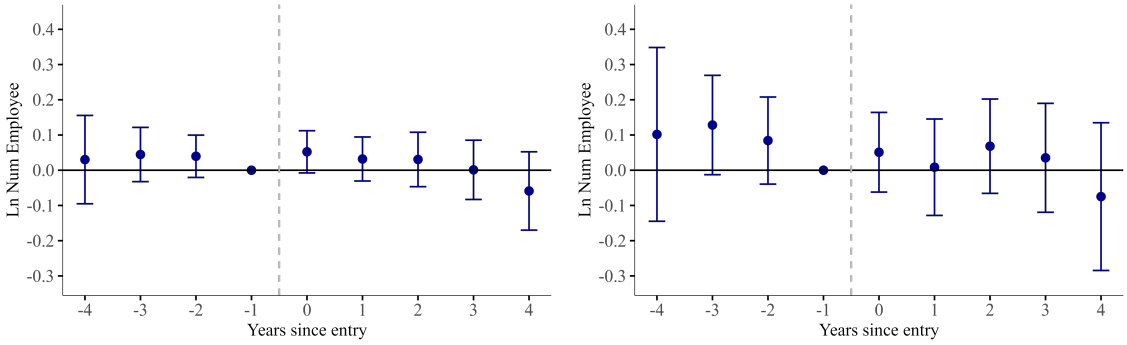
Notes: Figure E9 plots the estimated event-study coefficients, $\hat{\gamma}$, from equation 3. Panel A presents results for general entry, while Panel B reports results for competitive entry. The dependent variable is liabilities growth. Sub-panels (a) and (b) correspond to established firms (Columns 3 and 7 of Table E6); (c) and (d) to capacity-constrained firms (Columns 3 and 7 of Table E8); and (e) and (f) to short-term participants (Columns 3 and 7 of Table E10).

Figure E10. Event Study Plots Financial Performance: Employee growth

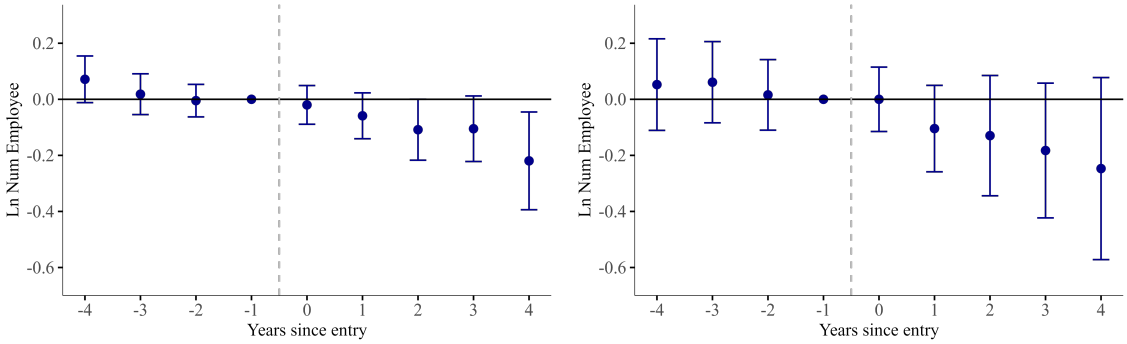
Panel A: General Entry Events *Panel B: Competitive Entry Events*



(a) Established Firms (b) Established Firms



(c) Capacity Constrained (d) Capacity Constrained



(e) Short-term participants (f) Short-term participants

Notes: Figure E10 plots the estimated event-study coefficients, $\hat{\gamma}$, from equation 3. Panel A presents results for general entry, while Panel B reports results for competitive entry. The dependent variable is liabilities growth. Sub-panels (a) and (b) correspond to established firms (Columns 4 and 8 of Table E6); (c) and (d) to capacity-constrained firms (Columns 4 and 8 of Table E8); and (e) and (f) to short-term participants (Columns 4 and 8 of Table E10).

F Robustness checks

This section presents the event study plots and regression tables of the estimations using not-yet-supplier firms as comparison groups. Table F1 presents the estimations for assets growth, capital assets, current ratio, liabilities growth, and liabilities. Table F2 presents the estimations for solvency, shareholder funds, number of employees, and employment growth.

Table F1. Event Study Estimates Financial Performance **Not Yet Suppliers** (Part 1)

	Panel A: General Entry Event					Panel B: Competitive Entry Event				
Event	Ln Assets	Assets	Current Ratio	Ln Liabilities	Liabilities	Ln Assets	Assets	Current Ratio	Ln Liabilities	Liabilities
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
5 years before entry	-0.017	22,353.825	0.042	-0.173*	-63,614.960*	-0.006	27,548.095	-0.458	-0.125	-54,092.621
	(0.040)	(38,011.255)	(0.240)	(0.039)	(22,052.895)	(0.085)	(80,598.633)	(0.517)	(0.088)	(39,651.157)
4 years before entry	-0.012	-18,894.554	0.109	-0.140*	-33,837.325	-0.015	-57,875.838	-0.361	-0.118	-40,624.794
	(0.025)	(27,493.495)	(0.142)	(0.029)	(14,984.239)	(0.055)	(52,554.406)	(0.339)	(0.052)	(35,346.500)
3 years before entry	-0.047*	-60,658.226*	0.097	-0.120*	-42,143.847*	-0.042	-78,318.391	-0.004	-0.094*	-39,311.854
	(0.016)	(17,595.090)	(0.100)	(0.018)	(10,041.671)	(0.037)	(33,976.448)	(0.209)	(0.033)	(22,601.316)
2 years before entry	-0.039*	-62,693.319*	0.025	-0.066*	-24,506.024*	-0.049	-61,256.044	0.046	-0.063	-36,101.234
	(0.012)	(12,432.310)	(0.075)	(0.013)	(7,626.737)	(0.025)	(22,475.746)	(0.174)	(0.025)	(15,970.613)
Year of entry	0.088*	14,952.516	-0.241*	0.113*	40,741.166*	0.092*	52,867.741	-0.104	0.134*	42,439.420
	(0.011)	(14,686.759)	(0.089)	(0.014)	(9,520.227)	(0.020)	(30,556.783)	(0.159)	(0.026)	(17,678.862)
1 year after entry	0.113*	-1,288.540	-0.437*	0.181*	75,335.956*	0.044	-46,056.163	-0.054	0.109*	61,217.398
	(0.016)	(22,275.253)	(0.116)	(0.019)	(12,948.732)	(0.027)	(41,717.855)	(0.227)	(0.036)	(24,396.528)
2 years after entry	0.109*	-493.401	-0.763*	0.221*	85,184.149*	0.056	-48,694.382	-0.262	0.151*	72,822.632
	(0.019)	(27,745.709)	(0.158)	(0.024)	(14,586.659)	(0.034)	(58,118.651)	(0.278)	(0.048)	(30,730.141)
3 years after entry	0.114*	52,254.883	-1.049*	0.267*	115,446.096*	0.016	-32,439.528	-0.691	0.161	98,080.252*
	(0.024)	(34,879.467)	(0.199)	(0.032)	(18,491.265)	(0.042)	(63,809.280)	(0.384)	(0.060)	(34,403.672)
4 years after entry	0.101*	56,550.350	-1.208*	0.249*	121,279.188*	-0.028	27,100.160	-0.729	0.079	41,869.886
	(0.028)	(43,990.882)	(0.232)	(0.037)	(21,317.577)	(0.057)	(90,660.685)	(0.436)	(0.074)	(44,740.563)
5 years after entry	0.070	46,411.588	-1.542*	0.310*	149,864.290*	-0.028	59,421.018	-1.092	0.175	114,893.540
	(0.036)	(50,483.995)	(0.275)	(0.043)	(26,807.631)	(0.064)	(96,323.112)	(0.532)	(0.082)	(54,100.662)
Observations	13,445	13,445	13,258	13,205	13,245	3,348	3,348	3,305	3,263	3,278
Cohorts	8	8	8	8	8	8	8	8	8	8
Years	13	13	13	13	13	13	13	13	13	13

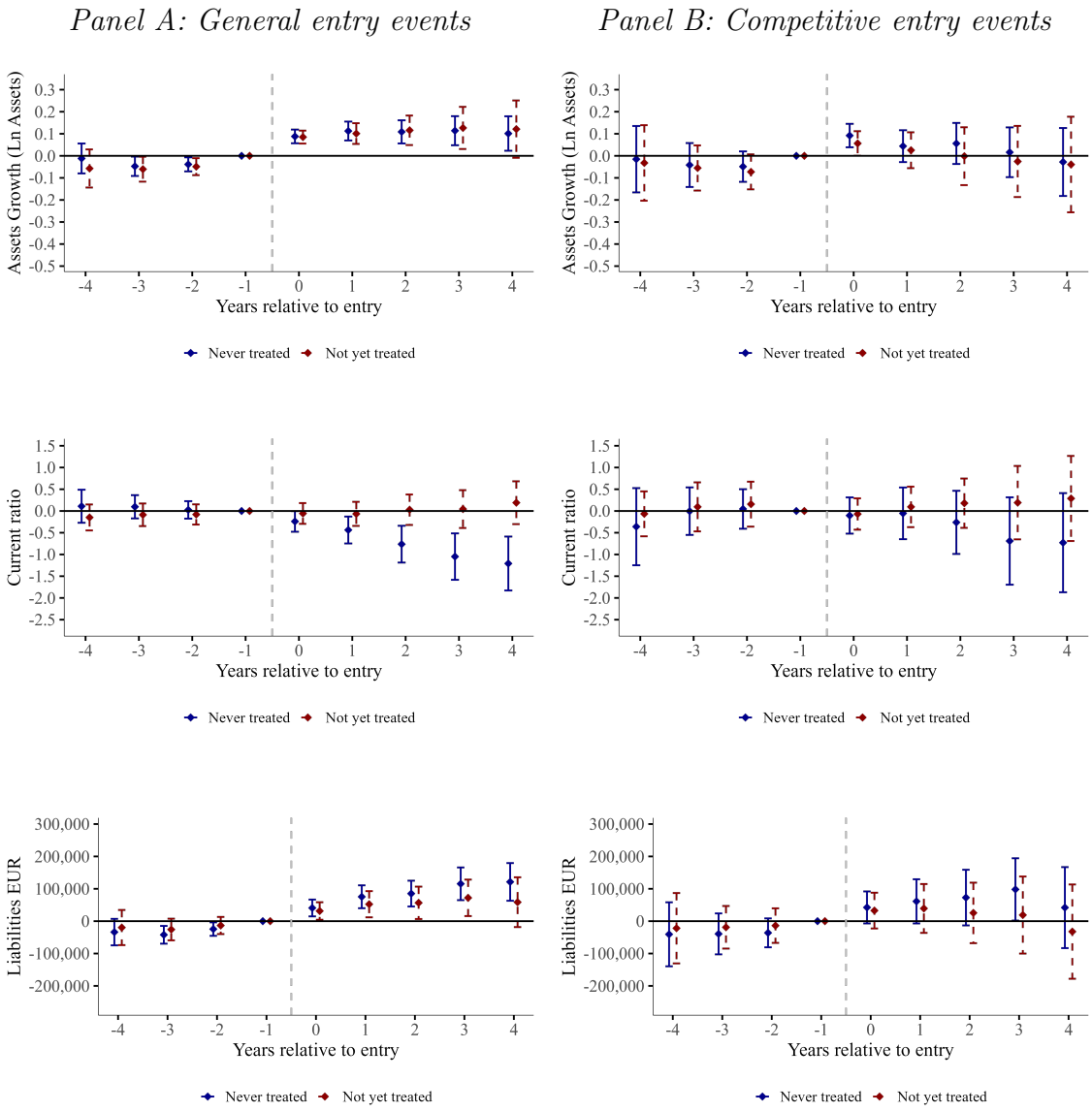
Notes: This table presents the estimations of event studies using Callaway and Sant'Anna estimator. Panel A presents the estimations for general entry events and Panel B for competitive entry events. Cohorts are defined by year of entry in the public procurement market: the first year in which the firm was awarded a contract by a public entity. The comparison group corresponds to not yet suppliers, never suppliers are excluded. Standard errors are presented in parenthesis and clustered at firm level.

Table F2. Event Study Estimates Financial Performance **Not Yet Suppliers** (Part 2)

	Panel A: General Entry Event				Panel B: Competitive Entry Event			
Event	Solvency	Shareholder	Employee	Ln Employee	Solvency	Shareholder	Employee	Ln Employee
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
5 years before entry	2.353	84,500.282*	-0.980	-0.002	3.232	96,372.139	-0.369	0.088
	(0.908)	(19,032.007)	(0.456)	(0.032)	(1.990)	(40,862.276)	(0.971)	(0.065)
4 years before entry	2.513*	70,744.342*	-0.416	0.041	1.044	48,102.051	-0.143	0.056
	(0.623)	(13,883.595)	(0.369)	(0.028)	(1.411)	(29,997.880)	(0.740)	(0.051)
3 years before entry	1.694*	33,263.133*	-0.615	0.027	0.931	19,325.002	0.094	0.084
	(0.434)	(8,507.272)	(0.272)	(0.020)	(0.877)	(17,671.290)	(0.515)	(0.034)
2 years before entry	1.234*	23,784.965*	-0.360	0.018	0.584	20,869.953	0.353	0.047
	(0.326)	(6,783.719)	(0.230)	(0.015)	(0.641)	(11,784.432)	(0.406)	(0.030)
Year of entry	0.160	18,340.010	0.114	0.020	-0.931	18,034.212	0.362	0.032
	(0.337)	(7,299.621)	(0.239)	(0.017)	(0.685)	(15,755.654)	(0.473)	(0.029)
1 year after entry	-0.494	19,447.391	0.319	-0.001	-1.459	-9,072.905	0.335	-0.014
	(0.463)	(11,480.974)	(0.324)	(0.019)	(0.882)	(22,767.946)	(0.586)	(0.035)
2 years after entry	-0.901	-1,031.977	0.324	-0.025	-2.164	-37,861.180	0.793	0.001
	(0.579)	(13,972.311)	(0.367)	(0.025)	(1.153)	(25,660.320)	(0.745)	(0.044)
3 years after entry	-1.640	-5,646.098	0.714	-0.024	-3.162	-34,020.320	0.806	-0.019
	(0.707)	(18,959.244)	(0.449)	(0.030)	(1.367)	(37,756.529)	(0.870)	(0.055)
4 years after entry	-1.510	11,136.842	0.193	-0.089	-2.201	-19,394.085	0.346	-0.106
	(0.776)	(24,637.740)	(0.558)	(0.035)	(1.474)	(47,556.658)	(1.047)	(0.070)
5 years after entry	-2.519	-16,287.526	0.028	-0.129*	-4.876*	-83,626.498	1.403	-0.069
	(0.922)	(28,673.184)	(0.704)	(0.042)	(1.641)	(52,686.095)	(1.347)	(0.080)
Observations	13,345	13,351	10,296	10,296	3,325	3,311	2,596	2,596
Cohorts	8	8	8	8	8	8	8	8
Years	13	13	13	13	13	13	13	13

Notes: This table presents the estimations of event studies using Callaway and Sant'Anna estimator. Panel A presents the estimations for general entry events and Panel B for competitive entry events. Cohorts are defined by year of entry in the public procurement market: the first year in which the firm was awarded a contract by a public entity. The comparison group corresponds to not yet suppliers, never suppliers are excluded. Standard errors are presented in parenthesis and clustered at firm level.

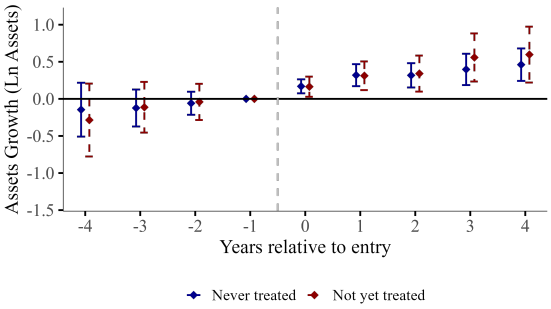
Figure F1. Event Study Plots Financial Performance



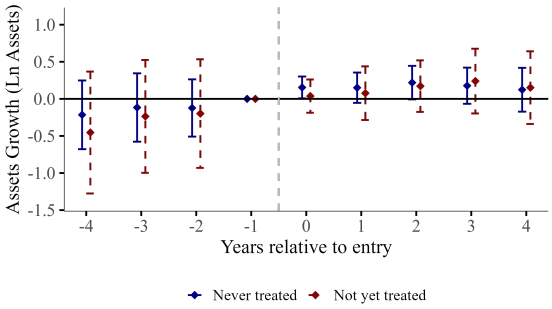
Notes: Figure F1 plots the estimated $\hat{\gamma}$ event-study coefficients from the regression given in equation 3 in the blue markers and solid lines. The red markers and dashed lines plot the estimated $\hat{\gamma}$ event-study coefficients comparing entrants with not yet suppliers while excluding explicitly never suppliers . Panel A presents the event study plots for general entry and Panel B for competitive entry. The dependent variables are: capital assets growth panels a and b, current ratio panels c and d, and liabilities panels e and f. Estimations based on Callaway and Sant'Anna estimator presented in table 3.

Figure F2. Event Study Plots Financial Performance Assets Growth by Firms Heterogeneity

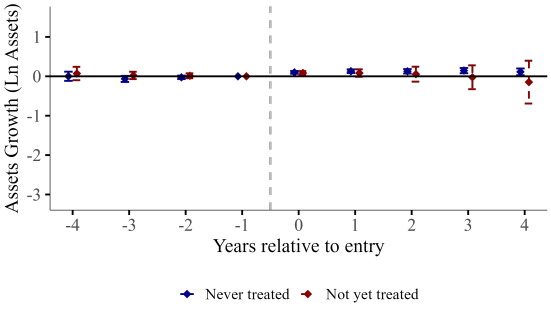
Panel A: General entry *Panel B: Competitive entry*



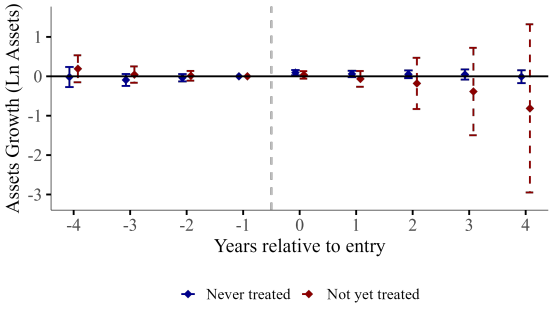
(a) Established Firms



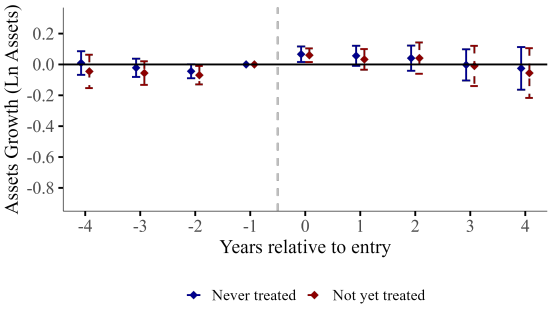
(b) Established Firms



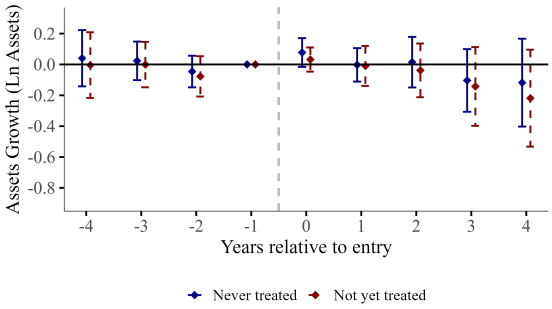
(c) Capacity Constrained



(d) Capacity Constrained



(e) Short-term participants



(f) Short-term participants

F.1 Additional regressions from mechanisms

Table F3. Relative bid reduce form regression - Alternative specification

	(1)	(2)	(3)	(4)
Short-term participant	-0.0456***	-0.0456**	-0.0530**	-0.0579**
	(-2.82)	(-2.34)	(-2.58)	(-2.30)
Capacity constrained	0.00244	0.00244	-0.00278	-0.0179
	(0.33)	(0.26)	(-0.30)	(-1.58)
Lowest Price (FPA)			0.0190**	0.0193*
			(2.02)	(1.95)
Firm age at auction			0.000203	0.000217
			(0.75)	(0.85)
Certified Firm			-0.0156	-0.000527
			(-1.51)	(-0.05)
Constant	1.069***	1.069***	1.055***	1.058***
	(190.97)	(263.92)	(84.31)	(73.12)
Observations	6672	6672	6663	6652
R^2	0.00138	0.00138	0.00291	0.0276
R^2adj	0.00108	0.00108	0.00217	0.0214
Year	No	No	No	Yes
Project	No	No	No	Yes
VCE	None	Firm Cluster	Firm Cluster	Firm Cluster

Notes: The specification in equation 6 includes dummy variables for short-term participants and capacity constrained firms, leaving established firms as a baseline. The main difference from the estimations from table 4 is that the firms here could have bid several times before their first win. t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table F4. Contracts characteristics

	Panel A: General			Panel B: Competitive					Panel C: Entry Events					Panel B: Entry Competitive				
Variable	Mean	Std.Dev	N	Mean	Std.Dev	N	Diff	p-value	Mean	Std.Dev	N	Diff	p-value	Mean	Std.Dev	N	Diff	p-value
WTO Agreement	0.40	0.49	14,711	0.42	0.49	3,362	-0.01	0.1167	0.44	0.50	4,235	-0.04	0.0000	0.53	0.50	1,095	-0.12	0.0000
Extensions	0.01	0.12	14,711	0.03	0.16	3,362	-0.01	0.0000	0.01	0.11	4,235	0.00	0.1486	0.02	0.13	1,095	0.01	0.0502
Electronic Auction	0.04	0.19	14,711	0.00	0.03	3,362	0.04	0.0000	0.01	0.07	4,235	0.03	0.0000	0.00	0.00	1,095	0.00	0.0833
Urgent Procedure	0.01	0.07	14,711	0.01	0.08	3,362	-0.00	0.3641	0.01	0.08	4,235	-0.00	0.6021	0.01	0.10	1,095	-0.00	0.3365
Outsourcing	0.01	0.09	14,112	0.01	0.10	3,362	-0.00	0.3228	0.01	0.09	4,122	0.00	0.9143	0.01	0.09	1,095	0.00	0.7535
SME tender	0.80	0.40	14,112	0.76	0.43	3,362	0.04	0.0000	0.86	0.35	4,122	-0.06	0.0000	0.87	0.34	1,095	-0.10	0.0000
Final Price Reported	0.79	0.41	14,711	0.99	0.07	3,362	-0.20	0.0000	0.82	0.39	4,235	-0.02	0.0004	1.00	0.06	1,095	-0.00	0.5229
Estimated Cost Reported	0.33	0.47	14,711	0.37	0.48	3,362	-0.04	0.0000	0.35	0.48	4,235	-0.02	0.0519	0.37	0.48	1,095	-0.00	0.9932
Final < Cost	0.25	0.43	14,711	0.32	0.47	3,362	-0.07	0.0000	0.29	0.46	4,235	-0.05	0.0000	0.33	0.47	1,095	-0.01	0.5312
Final = Cost	0.11	0.31	14,711	0.12	0.32	3,362	-0.01	0.1158	0.11	0.31	4,235	0.00	0.7299	0.12	0.33	1,095	-0.00	0.8267
Final > Cost	0.12	0.32	14,711	0.18	0.38	3,362	-0.06	0.0000	0.11	0.31	4,235	0.01	0.0736	0.18	0.38	1,095	0.00	0.9429
Missing Prices	0.52	0.50	14,711	0.38	0.49	3,362	0.14	0.0000	0.49	0.50	4,235	0.03	0.0001	0.37	0.48	1,095	0.01	0.4850
Quality Price Ratio	0.35	0.48	14,711	0.43	0.49	3,362	-0.08	0.0000	0.44	0.50	4,235	-0.09	0.0000	0.54	0.50	1,095	-0.11	0.0000
Lowest Price	0.03	0.16	14,711	0.05	0.22	3,362	-0.02	0.0000	0.04	0.19	4,235	-0.01	0.0005	0.07	0.26	1,095	-0.02	0.0150
Award Missing	0.62	0.48	14,711	0.52	0.50	3,362	0.10	0.0000	0.52	0.50	4,235	0.10	0.0000	0.39	0.49	1,095	0.14	0.0000

Notes: This table