



# Purpose matters: Impact of public loan guarantees on business growth

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## ABSTRACT

This study investigates the impact of public bank loan guarantees on firm performance in Finland, a small and open economy, leveraging a novel empirical approach and detailed financial instrument analysis. We combine registry-based data with records from Finnvera, Finland's National Promotional Bank, and apply the cutting-edge panel matching methodology of Imai et al. (2023) to address causal inference challenges in this context. Our results reveal that guarantees significantly boost turnover, employment, and total assets, with effects varying by loan purpose. Notably, guarantees tied to intangible investments yield the strongest growth in turnover and employment, alongside substantial asset expansion, a granularity often overlooked in prior studies. While average productivity effects are near zero, we uncover tentative evidence of positive productivity gains for intangible capital guarantees. Further disaggregation highlights amplified impacts among micro-enterprises, offering fresh insights into the heterogeneity of policy outcomes. These findings advance our understanding of public financial instruments' role in fostering economic growth at a nuanced level.

## 1. Introduction

National Promotional Banking (NPB) plays a vital role in supporting small and medium-sized enterprises (SMEs), with the European Association of Guarantee Institutions (AECM) reporting 206.5 billion EUR in outstanding guarantees, 45.3 billion EUR in new issuances, and 4.7 million SMEs aided across 31 countries in 2023. Guarantee volumes vary widely, from 2.5 % of GDP in France to 0.8 % in Italy, underscoring their economic significance.

Recent work by Bertoni et al. (2023) examines European Investment Fund (EIF) guarantees' effects on French SMEs, using a propensity score and coarsened exact matching framework to reveal sustained growth in sales, employment, and assets. We qualitatively replicate these findings in Finland, employing a distinct methodological lens. Existing studies—spanning the UK (Brown and Earle, 2017) Canada (Riding and Haines, 2001; Riding et al., 2007), Italy (Zecchini and Ventura, 2009), Spain (Briozzo and Cardone-Ripoteila, 2016), France (Lelarge et al., 2010; Barrot et al., 2024), Korea (Kang and Heshmati, 2008), and Japan (Uesugi et al., 2010) — consistently link bank loan guarantees to positive firm outcomes. Yet, gaps remain in granularity and methodological rigor.

This study advances the field by analysing Finnish NPB guarantees with comprehensive administrative and bank-specific data. We offer

three key contributions: (1) a pioneering granular analysis of loan purposes (e.g., working capital vs. intangible investments), revealing heterogeneous impacts overlooked in prior work; (2) the first application of Imai et al. (2023) panel matching framework in this domain, enhancing causal inference by matching firms' pre-treatment trajectories; and (3) new evidence from Finland's Nordic context, broadening the geographic scope of this literature. These innovations sharpen our understanding of how public guarantees drive economic outcomes.

## 2. The institutional setup

Finnvera, Finland's state-owned export credit agency and national promotional bank (NPB), provides bank loan guarantees to support new firms, investments, working capital, exports, and ownership transfers. This study focuses solely on its NPB guarantee function. Firms apply for loans from commercial banks, which may then seek Finnvera guarantees covering 50 %-80 % of the loan, ensuring banks retain at least 20 % risk exposure.

Finnvera operates on economic self-sustainability, requiring long-term profitability. Guarantee costs are risk-adjusted accordingly, with credit evaluations supplementing standard bank lending assessments (Fig. 1).

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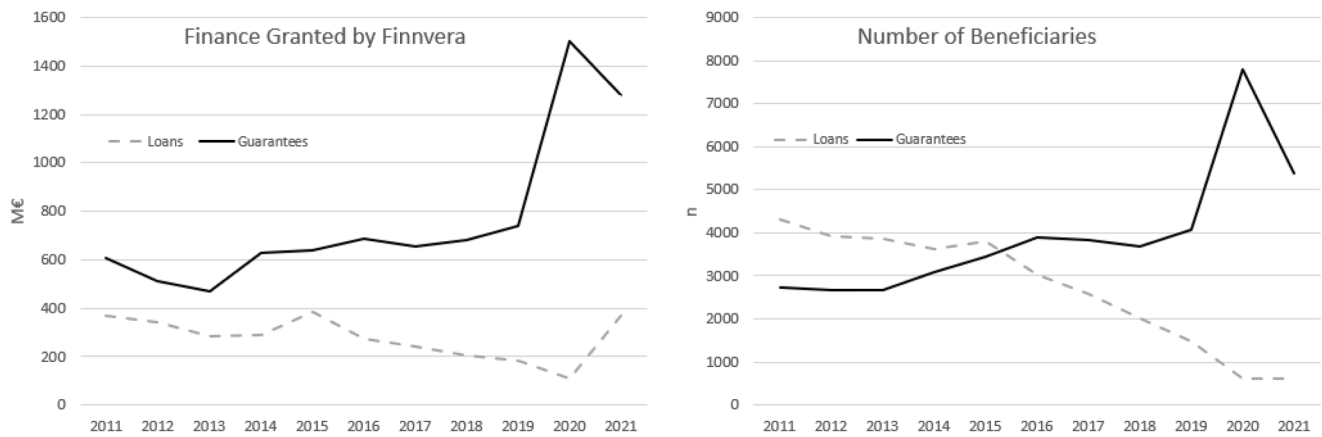


Fig. 1. Loans and guarantees by Finnvera in 2011–2021.

Table 1  
Descriptive Statistics 2011–2021 from the Sample Used in Estimations.

Treatment Group				Mean Values				
Variable	Category	n	Share	Turnover (M€)	Employees	Total Assets (M€)	Productivity (t€)	Guarantee Granted (t€)
Size	1	6,221	19 %	0.6	4	0.4	62	56
	2–9	16,465	50 %	1.5	9	1.0	54	92
	10–19	5,010	15 %	4.0	19	2.5	57	179
	20–49	3,527	11 %	7.3	36	4.8	58	285
	50–	1,571	5 %	25.4	108	16.7	59	967
	Total	32,794						
Age	<5 years	15,402	47 %	2.0	11	1.2	54	96
	5–19 years	11,766	36 %	3.7	18	2.4	58	168
	20–	5,626	17 %	7.2	30	5.0	60	324
	Total	32,794						
Industry	B, C, D and E <sup>a</sup>	9,179	28 %	6.7	29	4.6	60	297
	F <sup>b</sup>	3,899	12 %	2.7	15	1.3	60	95
	G-Ic	10,611	32 %	2.8	11	1.5	55	121
	J <sup>d</sup>	2,061	6 %	1.8	16	1.7	53	133
	Le	227	1 %	2.0	11	4.1	119	198
	M, N <sup>f</sup>	4,511	14 %	1.7	14	1.2	56	94
	O-Q <sup>g</sup>	986	3 %	0.9	13	0.5	43	66
	R, S, T and U <sup>h</sup>	1,320	4 %	0.7	7	0.9	40	67
	Total	32,794						
Finance	Intangible	1,168	4 %	2.0	15	1.4	52	108
	Machines	5,161	16 %	2.0	11	1.6	55	118
	Buildings	1,757	5 %	2.3	13	1.8	67	193
	Working Capital	24,708	75 %	3.9	19	2.5	56	170
	Total	32,794						
Potential Control Group (the untreated)				Mean Values				
Variable	Category	N	Share	Turnover (M€)	Employees	Total Assets (M€)	Productivity (t€)	
Size	1	585,655	42 %	0.2	2	0.4	162	
	2–9	659,322	47 %	0.7	5	0.8	73	
	10–19	83,239	6 %	3.2	16	3.4	66	
	20–49	45,505	3 %	9.9	34	9.5	77	
	50–	26,291	2 %	89.9	251	109.2	90	
	Total	1,400,012						
Age	<5 years	440,834	31 %	1.4	7	1.6	93	
	5–19 years	605,222	43 %	2.7	10	3.2	81	
	20–	353,956	25 %	4.0	13	4.8	180	
	Total	1,400,012						
Industry	B, C, D and E <sup>a</sup>	145,164	10 %	9.5	23	16.2	131	
	F <sup>b</sup>	240,637	17 %	1.3	7	1.1	75	
	G-Ic	442,533	32 %	3.1	10	1.7	142	
	J <sup>d</sup>	51,582	4 %	3.7	16	4.9	87	
	Le	46,945	3 %	1.5	4	10.0	415	
	M, N <sup>f</sup>	256,286	18 %	0.9	9	0.9	72	
	O-Q <sup>g</sup>	97,754	7 %	0.7	8	0.6	73	
	R, S, T and U <sup>h</sup>	119,111	9 %	0.2	3	0.2	41	
	Total	1,400,012						

<sup>a</sup> Total industry, <sup>b</sup> Construction, <sup>c</sup> Wholesale and retail trade, transportation and storage, accommodation and food service activities, <sup>d</sup> Information and communication, <sup>e</sup> Real estate activities, <sup>f</sup> Professional, scientific, technical, administration and support service activities, <sup>g</sup> Public administration, defence, education, human health and social work activities, <sup>h</sup> Other services.

### 3. Data and methodology

#### 3.1. The data

Our study focuses on firms receiving Finnvera guarantees, using an annual dataset from Statistics Finland covering all Finnish companies from 2011 to 2021. Finnvera's financing shifted from direct loans to bank loan guarantees over this period, with 1002 M€ supporting 6600 firms in 2011 and 967 M€ aiding 5200 firms in 2019. This trend, alongside a shrinking customer base, may reflect stricter bank lending policies and banking sector changes (Amberg and Becker, 2024).

We analyse financial statement data—detailing income, balance sheets, revenues, and expenses—alongside control variables like firm age, size, location, and industry (descriptive statistics in Table 1). Outcome variables include employment, turnover, total assets, and productivity (value added per employee). Our key contribution is assessing effects by financing purpose, leveraging detailed data on intended use to distinguish impacts across financial products—a novel addition, as use-specific effects (e.g., working capital vs. machinery investment) are underexplored.

Loans often serve multiple purposes; we classify each by its dominant use (e.g., a project with €1 million for buildings, €2 million for machinery, and €0.5 million for working capital is coded as machinery investment). Capital use distribution and average guarantees are reported in Table 2.

#### 3.2. The methodology

As our primary econometric method, we utilize the Panel Matching Method formalized by Imai et al. (2023). The main assumptions of the method are: 1) no spillover effects and 2) parallel trends assumption. Given that financing is granted mostly to small firms and only to a small subset of firms, the spillover effects are expected to be small.

We start by identifying set of control firms which carry identical treatment histories as the treated firms for a predetermined number of periods. We set the pre-treatment lag ( $L$ ) to be two, which means that firms under analysis must have at least two full accounting periods before the treatment.

In the sample, approximately 25 % of the treated firms received treatment more than once, highlighting the importance of accurately matching treatment histories. The refinement process, which enhances covariate balance based on firm age and two lags of the dependent variable, is also important. This approach accounts for the pre-treatment level and growth trend of a firm.<sup>1</sup> Additionally, we apply exact matching to industry and geographical area, ensuring that all comparisons are conditional on these two variables. The selection of matching variables closely follows, though not exactly, the formulation of Bertoni et al. (2023). This formalization ensures that industry-wide and area-wide shocks are taken into account in the analysis. We conduct the matching using propensity score weights.

Next, we define the lead period, that is, the period from which the average treatment effect for the treated (ATT) is calculated. The lead period affects the sample size, because firms without sufficient lead period are discarded from the data. Our primary specification assumes that the lead equals four ( $F = 4$ ). The lead period of four is chosen, because we are primarily interested in medium-term effects. Furthermore, the process of investing in capital, especially to heavy machinery or buildings, can take a considerable amount of time. We are interested in whether or not we can identify the saturation of the impact estimate a number of years after treatment. In practice, our lag and lead structure means that firms treated between 2013 and 2017 are in the final sample.

<sup>1</sup> As an additional robustness check, the refinement process was also conducted adding the logarithm of goods exports as a covariate. The results remain largely unchanged and are available upon request.

**Table 2**

The use of capital in Finnvera guarantees.

Use*	n	Average Financing (€)**
	(1)	(2)
Working Capital	20,729	175,000
Machinery and Equipment	2,872	139,000
Buildings	1,354	185,000
Intangible Capital	881	127,000
Total	25,836	204,000

\* Financing in land use and acquisition is dropped due to low frequency in the data ( $n = 46$ ). Financing for shares and holdings is related to transfer of firm ownership and are also excluded from the data. Finance for exports is outside the scope of this analysis.

\*\* Rounded to nearest thousand.

The outcome variable is the natural logarithm of the variable under investigation, measured in nominal terms, and treatment is denoted by a dummy variable equal to one when a Finnvera guarantee is received. Finally, the standard errors are computed using a block bootstrap with 1000 iterations.

Fig. 2 displays the standardized mean differences (SMDs) for the outcome variables of estimated models, measured in one and two periods prior to treatment. In line with established guidelines, an absolute SMD below 0.25 is generally considered indicative of acceptable covariate balance (Ho et al (2007), Stuart et al (2013)). All models estimated in this study meet this criterion, suggesting that the pre-treatment trends are sufficiently balanced to support credible causal inference.

### 4. Main results

Fig. 3 depicts our numerous results. A positive and sizable effect of guarantees is found with respect to turnover, employment and assets, but effects of guarantees on productivity are mostly statistically zero.

Several additional observations can be inferred from Fig. 3. First, the full effect is not typically visible immediately; it generally takes 1–2 years for the full impact to materialize. This finding underscores the limitation of the commonly used method of inspecting immediate effects. Second, the effects on turnover and assets are the most pronounced, whereas the impact on employment is smaller but more precisely estimated. Third, intangible investments have the greatest effect on both turnover and employment. Fourth, working capital exhibits the lowest impact estimates across all metrics, although the effects are still positive and statistically significant for turnover, employment, and assets. Fifth, investments in intangible assets show a notable pattern of increasing productivity gains after three years of treatment, indicating that these gains take considerable time to develop. While the estimate is not significant at the 5 % level, it is significant at the 10 % level. This result is tentatively consistent with findings by, for example, McGrattan (2020), Protogerou and Panagiotopoulos (2024) and Felix Roth and Rammer (2023).

The information provided in Fig. 3 in mind, we can do a "back of the envelope" calculation on the cost per job created of which an example is provided in the following. Assume a (causal) ATT estimate of 0.13 for Finnvera guarantees on employment, which is the weighted average of the impact estimates at  $t + 4$ . The average firm-level employment in 2021 was 10.6 and there were 5,381 new Finnvera guarantees. We can combine these numbers, and we get  $0.13 \times 10.6 \times 5381 \approx 7400$  employed thanks to Finnvera guarantees. The total amount of guarantees was 1,208 m€, thus, guarantee per employee amounts to approximately 174,000€. The credit loss rate is approximately 2.5 %, thus, the credit loss per new employee ratio equals approximately 4,350€. Half of the

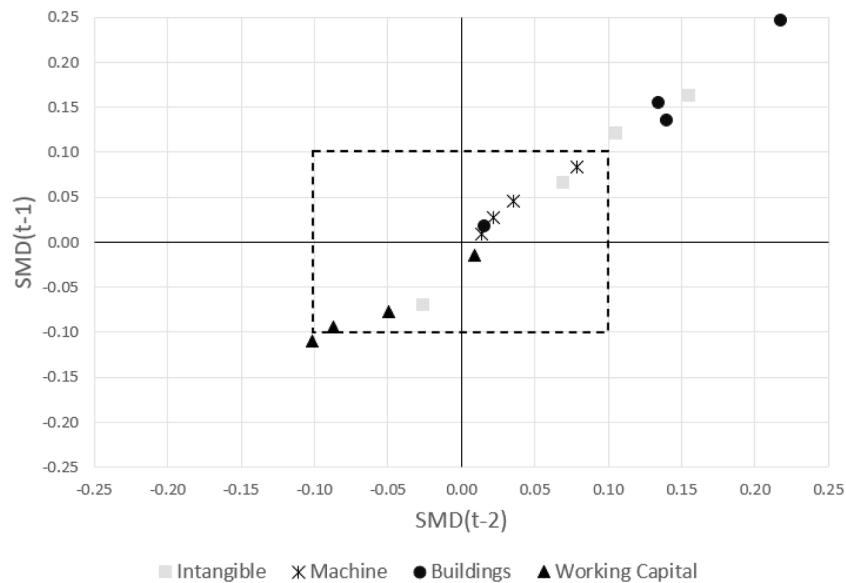


Fig. 2. Standardized Mean Differences in Estimated Models.

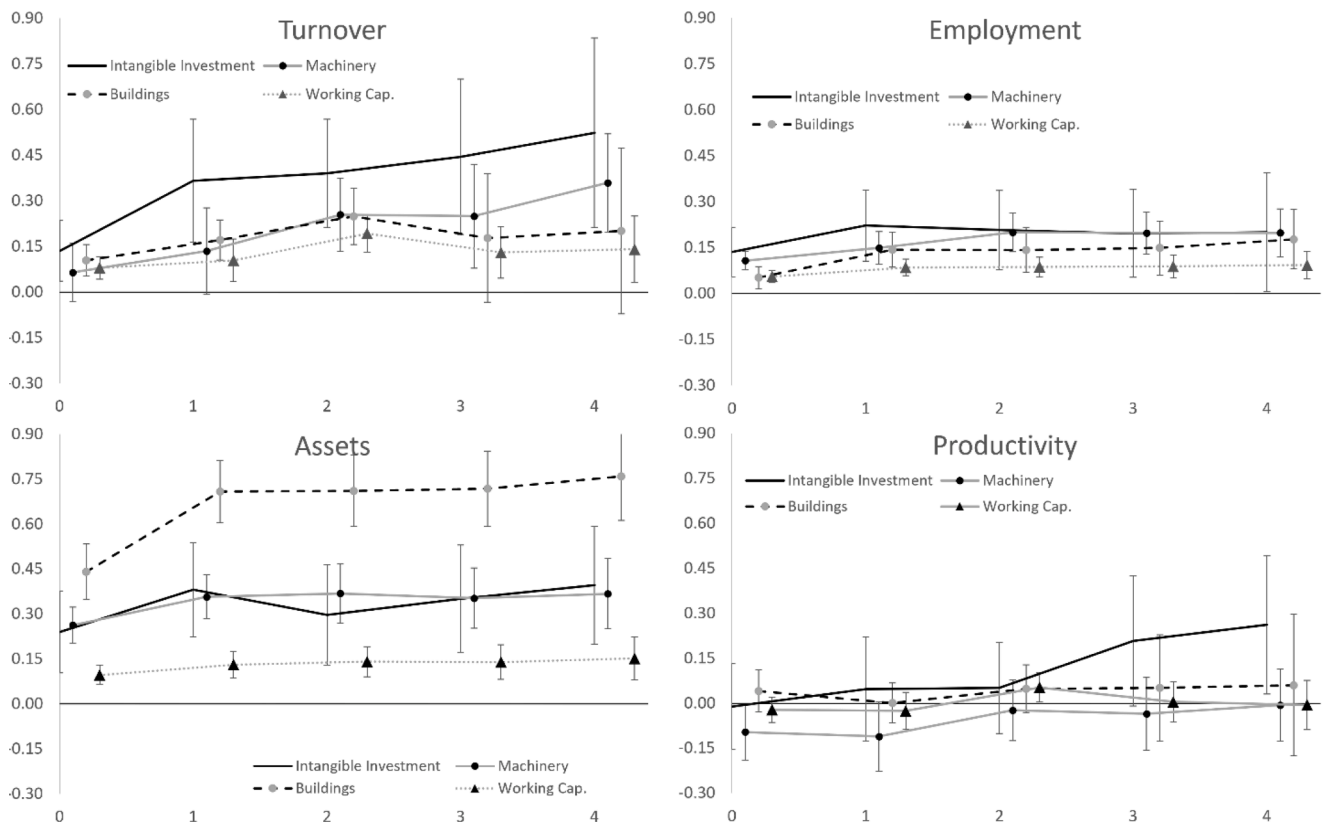


Fig. 3. Impact of Finnvera financing on turnover compared to (matched) control group.

credit loss is financed by the state whereas the other half remains within Finnvera, to be covered through its revenues. Overall, the direct cost per employee to the public sector is approximately 2,170€.<sup>2</sup> An average wage earner in Finland has a tax wedge of 43.5 % which equals to €23,000 in paid taxes and compulsory social security contributions

<sup>2</sup> Year 2021 was still affected by the covid pandemic. In a more typical year, the credit loss per employee is closer to 1,500€.

(OECD, 2024). Thus, under these assumptions, the direct monetary net benefit to the public sector is strictly positive.

### 5. Effects according to firm size

Firm size, measured by the number of employees, correlates negatively with ATT. The smaller the firm, the bigger impact we observe. The results are reported in Table 3. The impact measure is the estimate four years after treatment. The effect is by far largest for sole proprietors. The

**Table 3**  
Medium Term Effects According to Firm Size.

	Intangible	Machines	Buildings	Working Capital	Intangible	Machines	Buildings	Working Capital
Employees	Turnover				Employment			
1	0.987*	0.753*	0.421*	0.503*	0.695*	0.428*	0.253*	0.324*
2–9	0.462*	0.365*	0.051	0.133*	0.203*	0.199*	0.207*	0.119*
10–19	0.520	0.267	0.138	0.010	-0.132	0.123	0.054	0.089
20–49	-0.484	0.002	0.215	0.004	-1.008	-0.003	0.303	-0.031
50–	0.377	0.003	0.353	0.028	0.349	0.017	0.134	-0.033
Employees	Total Assets				Productivity			
1	0.823*	0.616*	0.941*	0.547*	0.207	0.093	0.313*	0.059
2–9	0.375*	0.357*	0.787*	0.183*	0.242*	0.002	-0.158	0.031
10–19	0.176	0.449*	0.478*	0.003	0.262	-0.035	0.123	-0.116
20–49	0.060	0.029	0.270	-0.072	0.873	0.107	-0.105	-0.001
50–	0.408	-0.381	-0.030	-0.001	0.537	-0.091	0.198	0.003

\* Statistically significant below 5 % confidence level.

impact estimate diminishes as a function of firm size but stays positive and statistically significant in many cases. The problem with estimating the impact on larger firms is that the sample size diminishes considerably, which widens the confidence intervals.

The results indicate that the impact estimates across outcomes are, unsurprisingly, correlated. If a positive impact is observed in, for example, turnover, also positive impact is to be expected in terms of employment and total assets. In general, the results indicate positive results for micro enterprises, whereas there is more variation for firms with 10 or more employees.

In terms of productivity, the results are mixed. Finance for working capital is statistically zero in all firm sizes. Also, investment in machinery shows statistically insignificant relation to productivity. On the other hand, investments in intangible capital show consistent positive effect on productivity, although the effect is statistically significant only for firms with 2–9 employees. This observation, however, enhances the indicative findings on productivity in previous section.

## 6. Conclusions

The impact of national promotional bank (NPB) guarantees on firm outcomes is a vital research area, given the substantial investments in NPB schemes globally and the implicit and explicit state subsidies most NPBs receive.

Our findings show that NPB guarantees primarily boost turnover, employment, and total assets in the short and medium term. Effects vary by financing purpose: investments in intangible capital most strongly enhance turnover and employment, while building investments drive the largest increases in total assets. Productivity impacts are often statistically indistinguishable from zero, though intangible capital investments hint at positive effects.

This study adds nuance to Barrot et al. (2024) who suggest negative labor allocation effects reduce aggregate productivity. We find no clear evidence of significant direct negative productivity impacts, yet the potentially positive productivity role of intangible capital highlights the need for case-by-case analysis of guarantee programs. This avenue merits further exploration.

The analysis of heterogeneous effects reveals that impact estimates are higher for smaller firms. However, there are statistical uncertainties regarding larger firms in many finance use categories due to the small number of treated companies. Therefore, the results concerning firms with 20 or more employees should be interpreted with caution.

Although this article represents a preliminary effort to understand

the effects of financing in relation to its purpose, it is evident that the use of financing plays a significant role. Future research should distinguish between different purposes of financing to obtain more accurate and practically applicable results. Additionally, the impact of financing on exports and ownership transfers warrants further investigation, taking into account the specific characteristics of these subjects.

## Data availability

The data that has been used is confidential.

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