Online Appendix for "Greening the Economy: How Public-Guaranteed Loans Influence Firm-Level Resource Allocation"

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A Institutional framework

A.1 EU Banks' Role in Transitioning to a Low-Carbon Economy

On December 12, 2015, 195 nations signed the "Paris Agreement" at the UN Climate Change Conference (COP21). This legally binding international treaty, along with the UN 2030 Agenda for Sustainable Development[1] represents the most significant initiative aimed at transitioning from a high-carbon economy ("brown economy") to a low-carbon economy ("green economy"). In November 2021, during the 26th Conference of the Parties (COP26), the guidelines for the Paris Agreement were approved and formally adopted. The Paris Agreement, with its goal of limiting the increase in global average temperature to a maximum of 2°C above pre-industrial levels, marks a turning point in creating a truly low-carbon and climate-resilient global economy.

The EU has been leading in the worldwide effort to significantly decrease carbon emissions. In 2016, the European Commission (EC) appointed a "High-Level Expert Group On Sustainable Finance (HLEG)" with the aim of creating guidelines for the establishment and development of sustainable finance in Europe. The main goal of the HLEG is to guide the European capital market towards financing projects that promote "sustainable economic growth".

In 2018, the EC announced its strategic mid-term goal to limit greenhouse gas emissions by at least 55% by 2030 and its long-term goal to create a climate-neutral European economy by 2050.[2] In March 2018, the EC published the "Action Plan: Financing Sustainable Growth".[3] This plan has three main goals: "i) reorient capital flows towards sustainable investment in order to achieve sustainable and inclusive growth; ii) manage financial risks stemming from climate change, resource depletion, environmental degradation and social issues; and iii) foster transparency and long-term in financial and economic activity.[4] Other key characteristics of the Action Plan include establishing a common taxonomy for sustainable finance, creating

[1] Available at: https://sustainabledevelopment.un.org/post2015/transformingourworld.

[2] European Commission communication, November 2018 "A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy" Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0773.

[3] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0097.

[4] Page 2 paragraph 1 "Finance for a more sustainable world" in the "Action Plan: Financing Sustainable Growth." Available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0097.

EU common standards for “European green financial products”, giving a mandate to the European Banking Authority (EBA) to assess how ESG risks can be included in the three pillars of prudential supervision, and, above all, incorporating sustainability in prudential requirements for insurance companies and banks (i.e., recalibrating capital requirements for banks to consider climate-related and environmental risks). As described in the Action Plan, the banking sector is expected to play a pivotal role in the transition toward a more sustainable economy *“The financial system is being reformed to address the lessons of the financial crisis, and in this context, it can be part of the solution towards a greener and more sustainable economy. Reorienting private capital to more sustainable investments requires a comprehensive shift in how the financial system works”.*[5] In 2019 and 2020, the Single Supervisory Mechanism (SSM)[6] identified climate-related risks as a significant risk driver on the SSM Risk Map[7] for the Euro area banking system. The ECB believes that institutions must adopt a comprehensive and forward-looking approach to evaluating climate-related and environmental risks. In May 2020, the ECB published its first draft[8] of the “Guide on climate-related and environmental risks”.[9] This guide describes the meaning of climate-related and environmental risks for banks and defines its two main drivers (i.e., physical and transition risks). The "physical risks" refer to the financial impact of adverse climatic events (e.g., floods, wildfires and storms). The "transition risks", on the other hand, may arise from implementing policies to shift the economy away from its dependence on fossil fuels. This guide also describes the climate-related and environmental key performance indicators (KPIs) that EU banks are expected to integrate into their strategy. Specifically, a European bank must integrate and disclose the following environmental KPIs indicators: “i) the carbon emission footprint of its assets; ii) the average energy label of its mortgage portfolios; iii) the number of homes that saw an energy label improvement thanks to its financing; and

[5] Page 1 paragraph 1 "Setting the scene" in the “Action Plan: Financing Sustainable Growth”. Available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0097.

[6] The Single Supervisory Mechanism (SSM) is the banking supervisory arm of the ECB. See: https://www.bankingsupervision.europa.eu/about/thessm/html/index.en.html.

[7] SSM Risk Map 2019. Available at: https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ra/ssm.ra2019.en.pdf. SSM Risk Map 2020. Available at: https://www.bankingsupervision.europa.eu/ecb/pub/ra/html/ssm.ra2020~a9164196cc.en.html.

[8] Subject to public consultation

[9] Guide on climate-related and environmental risks. Available at: https://www.bankingsupervision.europa.eu/legalframework/publiccons/html/climate-related_risks.en.html..

iv) the share of assets under management that was invested according to a predefined green investment mandate".[10] Finally, this guide requests banks to include climate-related and environmental risks in their: risk appetite framework (RAF); business strategy; management body; committees; organizational structure; reporting; existing risk management framework. We can say that European banks are under strong regulatory pressure to decrease their exposure to brown companies and increase their exposure to green companies, facilitating the transition to a greener economy.

A.2 Public-Guaranteed Loans in Europe as a Response to COVID-19

Since the first reported cases on January 21, 2020, in Northern Italy, COVID-19 has spread throughout the EU with devastating and shocking impact (Ding et al., 2021). The first wave, which peaked in April 2020, led to a surge in infections and fatalities. The unprecedented containment measures adopted by European governments, such as travel restrictions, lockdowns, school closures, and bans on large gatherings, helped reduce the virus's spread. However, the containment measures drastically affected firms' activities, negatively affecting the real economy (OECD, 2020). For this reason, European governments issued a series of relief mechanisms, such as tax deferrals, grants, equity injections, and changes to accounting policies, to avoid corporate failures and protect the economy (Kirti et al., 2022). Furthermore, numerous European countries have implemented (or enhanced) their guarantee schemes to address firms' liquidity shortages as a critical component of their policy response (Altavilla et al., 2021; Schivardi and Romano, 2020).

As EU Commission Regulation No. 651/2014 defined, the PGLs schemes EU countries designed during the pandemic had several common features. Specifically, the Commission has established: i) limits on the total size of guaranteed loans, which cannot exceed 25% of the beneficiary's total turnover in 2019 or twice the annual wage bill of the beneficiary for 2019; ii) minimum guarantee premiums that increase with maturity and are more rigorous for large enterprises compared to Small and Medium Enterprises (SMEs); iii) a maximum

[10] Page 18, "Guide on climate-related and environmental risks". Available at: https://www.bankingsupervision.europa.eu/legalframework/publiccons/html/climate-related_risks.en.html..

maturity period of six years for all loans. Interestingly, the EC designed PGLs schemes to ensure that banks have enough "accountability" to remain aware of the creditworthiness of firms when granting guaranteed loans (Altavilla et al., 2021). For example, if losses are shared equally between the bank and the state, the public guarantee cannot exceed 90% of the loan principal, and if the state has a lower priority than the bank, the public guarantee cannot exceed 35% of the loan principal.

However, certain details of these schemes are determined by *ad-hoc* national policies. Table A1 in this Appendix reports the PGLs schemes for the twelve European countries considered in our study. Both the Italian and German governments also offered 100% guaranteed loans, with Italy providing this for all loans up to €30,000 for small firms. However, as shown in the table, the guaranteed portion typically ranged from 70% to 90%, with smaller percentages given to larger firms. The table also highlights that the Italian, German, Spanish, and French schemes are more complex, with *ad-hoc* limitations. We can observe that during the COVID-19 pandemic, PGLs were primarily issued to address liquidity shortages faced by firms. Numerous European countries implemented or expanded their guarantee schemes as a crucial component of their policy response. While this approach aimed to alleviate liquidity issues, it may have also led to unintended consequences on the real economy.

Table A1: **State Guarantee Framework**

Country	Program Name	Type of firm	Turnover Firm size	N. Employees	Max amount	Limit	% Guarantee	Interest rate
Austria	SME loan guarantee program	All			2,5 M (excluded in specific cases)	(never >25% rev. in 2019) or (twice wage bill 2019)	90%	Capped 2%
Belgium	Regional							Not disclosed
Finland	FSA	All non financial corporations			Ad-hoc agreement	Ad-hoc agreement	80%	Not disclosed
France	PGE	Small	<1,5 BN (turn.)	<5,000 empl.	5 M	(never >25% rev. in 2019)	90%	0,25% to 0,50% first year after 0,50% to 2%
	PGE	Medium	>1,5 BN but <5 BN (turn.)	>5,000 empl.	5 M	(never >25% rev. in 2019)	80%	0,25% to 0,50% first year after 0,50% to 2%
	PGE	Large	>5 BN (turn.)	>5,000 empl.	5 M	(never >25% rev. in 2019)	70%	0,25% to 0,50% first year after 0,50% to 2%
Germany	KFW	Companies in the KFW-Schnellkredit programme		>10 empl.	1 BN	(never >25% rev. in 2019) or (twice wage bill 2019)	100%	3%
	KFW	SMEs	<50 M turnover <= 43 M (balance sheet)	<50 empl.	1 BN	(never >25% rev. in 2019) or (twice wage bill 2019)	90%	1% to 1,46%
	KFW	All the others (except “large” see below)			1 BN	(never >25% rev. in 2019) or (twice wage bill 2019)	80%	2% to 2,12%
	WSF	Large	Firms with two of the following characteristics >43 M turnover >50 M sales >249 employees		Ad-hoc agreement	Ad-hoc agreement	Ad-hoc agreement	Not disclosed
Greece	SGF-SMEs	SMEs	<50 M turnover	<250 empl.	1,5 M	(never >25% rev. in 2019)	80%	Not disclosed
Ireland	CGS	SMEs	<50 M turnover	<499 empl.	1,5 M	Ad-hoc agreement	80%	Maximum 4%

Continued Table from previous page

Country	Program Name	Type of firm	Turnover Firm size	N. Employees	Max amount	Limit	% Guarantee	Interest rate
Italy	CGF	Small		<500 empl.	<= 30,000	(never >25% rev. in 2019) or (twice wage bill 2019)	100%	0,25% to 0,50% first year 0,50% to 1% second year 0,50% to 1% third year. 1% to 2% after
	CGF	Small	<3,2 M turnover	<500 empl.	>30,000 but <= 80,000	(never >25% rev. in 2019) or (twice wage bill 2019)	100%	0,25% to 0,50% first year 0,50% to 1% second year 0,50% to 1% third year. 1% to 2% after
	CGF	Small		<500 empl.	>30,000 but <= 5M	(never >25% rev. in 2019) or (twice wage bill 2019)	90%	0,25% to 0,50% first year 0,50% to 1% second year 0,50% to 1% third year. 1% to 2% after
	SACE	Medium	<1,5 BN	>500 but <5,000 empl.	No Max Amount	(never >25% rev. in 2019) or (twice wage bill 2019)	90%	0,25% to 0,50% first year 0,50% to 1% second year 0,50% to 1% third year. 1% to 2% after
	SACE	Medium /Large	>1,5 BN but <5 BN	>5,000 empl.	No Max Amount	(never >25% rev. in 2019) or (twice wage bill 2019)	80%	0,25% to 0,50% first year 0,50% to 1% second year 0,50% to 1% third year. 1% to 2% after
	SACE	Large	>5 BN		No Max Amount	(never >25% rev. in 2019) or (twice wage bill 2019)	70%	0,25% to 0,50% first year 0,50% to 1% second year 0,50% to 1% third year. 1% to 2% after
Luxemburg		Small /Medium	<50 M turnover	<250 empl	2,5 M	(never >25% rev. in 2019)	85%	1,5% to 3%
Netherlands	SME CGS	Small /Medium		<250 empl	No Max Amount	(never >25% rev. in 2019)	80%	Not disclosed
Portugal	MPE	All			No Max Amount	(never >25% rev. in 2019)	90%	Not disclosed
Spain	ICO	Small /Medium	<50 M turnover <= 43 M (balance sheet)	<50 empl.	No Max Amount	(never >25% rev. in 2019) or (twice wage bill 2019)	80%	0,20% to 1,20%
	ICO	Large	>50 M turnover >43 M (balance sheet)	>50 empl.	No Max Amount	(never >25% rev. in 2019) or (twice wage bill 2019)	70%	0,20% to 1,20%
	ICO	Renewals	>50 M turnover >43 M (balance sheet)	>250 empl.	No Max Amount	(never >25% rev. in 2019) or (twice wage bill 2019)	60%	0,20% to 1,20%

Table A2: **Green State Guarantee Lending**

Table A2 reports estimates from equation **??** where the impact of Greenhouse Gas Emission (GHGTot) on the Public Guarantee Loan share (PGL) is analyzed. GHGTot is the sum of Scope 1, 2 and 3 GHG emissions to the firm's revenues. In column (1), we include ILS* Quarter and Bank fixed effects, and in column (2), we add Country fixed effects. Standard errors are two-way clustered at the Firm Bank level. Observations are between Q1-2019 and Q4-2020. All variables are defined in Table **??**. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

DEPENDENT VARIABLE **PGL**	(1)	(2)
GHGTot	-0.024***	-0.024***
	(-3.357)	(-3.357)
Firm Size	-0.023***	-0.023***
	(-10.266)	(-10.266)
Firm ROA	0.017**	0.017**
	(2.202)	(2.202)
Firm Working capital	0.041***	0.041***
	(3.862)	(3.862)
Firm Cash	0.095***	0.095***
	(5.093)	(5.093)
Firm Debt	-0.025***	-0.025***
	(-8.564)	(-8.564)
Bank Size	-0.100***	-0.100***
	(-2.680)	(-2.680)
Deposit	-0.665***	-0.665***
	(-2.640)	(-2.640)
NPL	-0.257	-0.257
	(-1.123)	(-1.123)
Bank ROA	-2.358*	-2.358*
	(-1.662)	(-1.662)
Liquidity ratio	-0.272	-0.272
	(-1.318)	(-1.318)
Fees and commissions	0.104	0.104
	(0.626)	(0.626)
Bank Capitalitation	0.029	0.029
	(0.100)	(0.101)
RWA	0.128	0.128
	(0.892)	(0.892)
Bank Provisions	2.027	2.027
	(0.784)	(0.784)
Moratoria	-0.126*	-0.126*
	(-1.954)	(-1.954)
CB Liquidity	-0.488***	-0.488***
	(-3.094)	(-3.094)
Observations	4,528,330	4,528,330
R-squared	0.536	0.536
Bank FE	YES	YES
ILS*Quarter FE	YES	YES
Country*Quarter FE	NO	YES
Cluster	Firm Bank	Firm Bank
N. Banks	1,030	1,030
N. Firms	478,141	478,141

Table A3: **Green State Guarantee Lending: Firm Heterogeneity**

Table A3 reports estimates from equation **??** where the impact of Greenhouse Gas Emission (GHGTot) on the Public Guarantee Loan share (PGL) and firm heterogeneity is analyzed. GHGTot is the sum of Scope 1, 2 and 3 GHG emissions to the firm's revenues. All models include ILS*Quarter, Bank and Country fixed effects. Standard errors are two-way clustered at the Firm Bank level. Observations are between Q1-2019 and Q4-2020. All variables are defined in Table **??**. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

DEPENDENT VARIABLE **PGL**	(1)	(2)	(3)	(4)
GHGTot	-0.019***	-0.023***	0.007	-0.054***
	(-2.640)	(-2.641)	(0.942)	(-4.184)
Firm ROA	0.029***			
	(3.479)			
GHGTot*Firm ROA	-0.002***			
	(-3.088)			
Firm Working capital		0.042***		
		(3.528)		
GHGTot*Firm Working capital		-0.000		
		(-0.107)		
Firm Cash			0.118***	
			(5.690)	
GHGTot*Firm Cash			-0.003***	
			(-6.531)	
Firm Debt				-0.028***
				(-9.367)
GHGTot*Firm Debt				0.001**
				(2.498)
Observations	4,528,330	4,528,330	4,528,330	4,528,330
R-squared	0.537	0.536	0.537	0.537
Bank controls	YES	YES	YES	YES
Firm controls	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES
ILS*Quarter FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Cluster	Firm Bank	Firm Bank	Firm Bank	Firm Bank
N. Banks	1,030	1,030	1,030	1,030
N. Firms	478,141	478,141	478,141	478,141

Table A4: **Green State Guarantee Lending: Lending growth.**

Table A4 reports estimates from equation **??** where the impact of Greenhouse Gas Emission (GHGTot) and the Public Guarantee Loan share (PGL) on lending growth is analyzed. GHGTot is the sum of Scope 1, 2 and 3 GHG emissions to the Firm's revenues. In column (1), we include Firm* Quarter and Bank fixed effects; in column (2), we add Country fixed effects; in column (3)-(4), we substitute Firm fixed effects with ILS fixed effects. Standard errors are two-way clustered at the Firm Bank level. Observations are between Q1-2019 and Q4-2020. All variables are defined in Table **??**. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

DEPENDENT VARIABLE **Lending (Lending growth)**	(1)	(2)	(3)	(4)
GHGTot			0.013	0.013
			(0.919)	(0.919)
PGL	0.163***	0.163***	0.155***	0.155***
	(9.448)	(9.448)	(7.409)	(7.409)
GHGTot*PGL	-0.001***	-0.001***	-0.001*	-0.001*
	(-3.608)	(-3.608)	(-1.663)	(-1.663)
Firm Size			0.001*	0.001*
			(1.899)	(1.899)
Firm ROA			0.032***	0.032***
			(10.564)	(10.564)
Firm Working Capital			0.009***	0.009***
			(5.430)	(5.430)
Firm Cash			-0.037***	-0.037***
			(-9.573)	(-9.573)
Firm Debt			0.009***	0.009***
			(7.648)	(7.648)
Bank Size	0.012	0.012	0.012	0.012
	(0.720)	(0.720)	(0.683)	(0.683)
Deposit	-0.139	-0.139	-0.110	-0.110
	(-0.717)	(-0.717)	(-0.556)	(-0.556)
NPL	-0.295*	-0.295*	-0.286*	-0.286*
	(-1.960)	(-1.960)	(-1.811)	(-1.811)
Bank ROA	-2.264***	-2.264***	-2.382***	-2.382***
	(-2.645)	(-2.645)	(-2.582)	(-2.582)
Liquidity Ratio	-0.129	-0.129	-0.103	-0.103
	(-0.942)	(-0.942)	(-0.723)	(-0.723)
Fees and Commissions	-0.103	-0.103	-0.090	-0.090
	(-1.437)	(-1.437)	(-1.142)	(-1.142)
Bank Capitalitation	0.150	0.150	0.134	0.134
	(0.786)	(0.786)	(0.678)	(0.678)
RWA	-0.045	-0.045	-0.041	-0.041
	(-0.618)	(-0.618)	(-0.543)	(-0.543)
Bank Provisions	-6.392***	-6.392***	-5.528***	-5.528***
	(-3.213570)	(-3.213)	(-2.617)	(-2.617)
Moratoria	-0.047***	-0.047***	-0.041**	-0.041**
	(-2.838)	(-2.838)	(-2.031)	(-2.031)
CB Liquidity	-0.066	-0.066	-0.053	-0.053
	(-1.066)	(-1.066)	(-0.806)	(-0.806)
Observations	2,502,658	2,502,658	3,077,158	3,077,158
R-squared	0.425	0.425	0.379	0.379
Bank FE	YES	YES	YES	YES
Firm*Quarter FE	YES	YES	NO	NO
ILS*Quarter FE	NO	NO	YES	YES
Country*Quarter FE	NO	YES	NO	YES
Cluster	Firm Bank	Firm Bank	Firm Bank	Firm Bank
N. Banks	953	953	961	961
N. Firms	210,107	210,107	343,725	343,725

Table A5: **Green State Guarantee Lending: Bank-Firm New Relationship.**
Table A5 reports estimates from equation **??** where the impact of Greenhouse Gas Emission (GHGTot) on the Bank-Firm New Relationship is analyzed. GHGTot is the sum of Scope 1, 2 and 3 GHG emissions to the Firm's revenues. In column (1), we include ILS fixed effects; in column (2), we add Country fixed effects. Standard errors are two-way clustered at the Firm Bank level. Observations are between Q1-2019 and Q4-2020. All variables are defined in Table **??**. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

DEPENDENT VARIABLE **Bank-Firm New Relationship**	(1)	(2)
GHGTot	0.001***	0.001***
	(5.400)	(5.657)
PGL	0.187***	0.186***
	(10.756)	(10.296)
GHGTot*PGL	-0.004***	-0.004***
	(-11.431)	(-11.381)
Firm Size	-0.056***	-0.057***
	(-16.653)	(-17.329)
Firm ROA	-0.022	-0.023*
	(-1.518)	(-1.683)
Firm Working capital	-0.036***	-0.035***
	(-11.748)	(-12.053)
Firm Cash	0.339***	0.336***
	(18.517)	(17.946)
Firm Debt	-0.081***	-0.081***
	(-14.608)	(-14.699)
Bank Size	-0.002	-0.004
	(-0.730)	(-1.378)
Deposit	-0.071	-0.079
	(-1.028)	(-0.914)
NPL	-0.248**	-0.238
	(-1.964)	(-1.568)
Bank ROA	2.720	4.733
	(1.169)	(1.486)
Liquidity ratio	-0.162	-0.170
	(-0.833)	(-0.868)
Fees and commissions	0.095*	0.067
	(1.824)	(1.338)
Bank Capitalitation	0.153	0.029
	(0.692)	(0.134)
RWA	-0.034	-0.066
	(-0.660)	(-1.155)
Bank Provisions	1.266	2.563***
	(1.499)	(3.016)
Moratoria	0.073	0.028
	(0.790)	(0.344)
CB Liquidity	0.331*	0.414**
	(1.776)	(2.001)
Observations	940,979	940,979
R-squared	0.535	0.537
ILS FE	YES	YES
Country FE	NO	YES
Cluster	Firm Bank	Firm Bank
N. Banks	1,029	1,029
N. Firms	470,213	470,213

Table A6: **Robustness test: Controlling for share lending.**

Table A6 reports estimates from equations **??**-**??**-**??**. $GHGTot$ is the sum of Scope 1, 2 and 3 GHG emissions to the Firm's revenues. $Share$ represents the portion of a company's overall credit from the bank, calculated precisely at the firm-bank level, based on committed loan sums as of December 2019. is Standard errors are two-way clustered at the Firm Bank level. Observations are between Q1-2019 and Q4-2020. All variables are defined in Table **??**. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
VARIABLES	PGL	Lending (Lending growth)	Lending (Lending growth)	Bank-Firm New Relationship
PGL		0.166***	0.152***	0.194***
		(14.332)	(9.657)	(7.306)
GHGTot	-0.018*		0.001	0.122***
	(-1.953)		(0.042)	(5.343)
GHGTot*PGL		-0.001***	-0.001*	-0.004***
		(-3.348)	(-1.694)	(-5.612)
Share	-0.160***	-0.020***	-0.013***	-0.088***
	(-8.582)	(-6.047)	(-3.672)	(-3.779)
Observations	2,130,020	1,012,839	1,357,947	517,614
R-squared	0.622	0.488	0.439	0.585
Firm controls	YES	YES	YES	YES
Bank controls	NO	YES	YES	YES
Bank FE	YES	YES	YES	YES
Firm*Quarter FE	NO	YES	NO	NO
ILS*Quarter FE	YES	NO	YES	NO
Country*Quarter FE	YES	YES	YES	NO
ILS FE	NO	NO	NO	YES
Country FE	NO	NO	NO	YES
Cluster	Firm Bank	Firm Bank	Firm Bank	Firm Bank
N. Banks	84	78	81	89
N. Firms	305,290	111,280	203,125	313,012

Table A7: **ISS greenhouse gas emission proxy**

Table A7 reports estimates from equation **??** where the impact of disclosed Greenhouse Gas Emission (ISS_GHGTot) on both the firm probability of default (PD) and the Public Guarantee Loan share (PGL) is analyzed. In column (1), we include ILS fixed effects; in column (2), we include IL and Bank fixed effects; in columns (3-4), we include IL*Quarter and Bank fixed effects; and in column (5), we include IL*Quarter, Country*Quarter and Bank fixed effects. Standard errors are two-way clustered at the Firm Bank level. All variables are defined in Table **??**. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Sample period: 2019			Full sample	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	PD	PD	PD	PGL	PGL
ISS_GHGTot	-0.427**	-0.389**	-0.404**	-0.170**	-0.171**
	(-2.380)	(-2.653)	(-2.389)	(-2.153)	(-2.144)
Firm Size	0.010	0.010	0.017	-0.013*	-0.013*
	(0.549)	(0.548)	(0.754)	(-1.779)	(-1.751)
Firm ROA	-0.773***	-0.772***	-1.121***	0.080	0.081
	(-3.287)	(-3.256)	(-3.339)	(0.668)	(0.671)
Firm Working capital	0.017	0.035	-0.005	-0.024	-0.024
	(0.206)	(0.502)	(-0.043)	(-0.263)	(-0.264)
Firm Cash	0.007	-0.011	0.099	0.077	0.077
	(0.074)	(-0.124)	(0.798)	(0.716)	(0.712)
Firm Debt	0.191**	0.171**	0.198**	-0.071	-0.068
	(2.616)	(2.447)	(2.565)	(-1.577)	(-1.480)
Bank Size				0.102	0.055
				(1.555)	(0.724)
Deposit				0.151	0.100
				(0.479)	(0.301)
NPL				-0.194	-0.212
				(-0.694)	(-0.550)
Bank ROA				-0.076	-0.690
				(-0.037)	(-0.255)
Liquidity ratio				-0.225	-0.295
				(-0.504)	(-0.534)
Fees and commissions				-0.215	-0.241
				(-1.234)	(-1.168)
Bank Capitalitation				0.512	0.634
				(0.972)	(0.921)
RWA				-0.232	-0.299
				(-0.738)	(-0.719)
Bank Provisions				2.007	4.965
				(0.672)	(1.422)
Moratoria				-0.233	-0.297
				(-1.133)	(-1.206)
CB Liquidity				0.300	0.467
				(1.090)	(1.418)
Observations	3,240	3,238	2,313	5,971	5,966
R-squared	0.790	0.808	0.775	0.734	0.735
Bank FE	NO	YES	YES	YES	YES
IL FE	YES	YES	NO	NO	NO
IL*Quarter FE	NO	NO	YES	YES	YES
Country*Quarter FE	NO	NO	NO	NO	YES
Cluster	Firm Bank	Firm Bank	Firm Bank	Firm Bank	Firm Bank
N. Banks	58	56	55	59	59
N. Firms	554	554	534	534	534

Table A8: **Robustness: Green State Guarantee Lending - COVID19 outbreak.** Table A8 reports estimates from equation ?? where the impact of Greenhouse Gas Emission (GHGTot) on the Public Guarantee Loan share (PGL) during the Covid outbreak is analyzed. GHGTot is the sum of Scope 1, 2 and 3 GHG emissions to the firm's revenues. COVID19 is a dummy variable that equals one from 2020Q1-Q4, and zero from 2019Q1-Q4. In column (1), we include ILS*Quarter and Bank fixed effects; in column (2), we add Country*Quarter fixed effects. Standard errors are two-way clustered at the Firm Bank level. Observations are between Q1-2019 and Q4-2020. All variables are defined in Table ??. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Full Sample	
DEPENDENT VARIABLE	(1)	(2)
PGL		
GHGTot	0.014	0.013
	(1.513)	(1.469)
GHGTot*COVID19	-0.051***	-0.051***
	(-4.142)	(-4.229)
Firm Size	-0.033***	-0.033***
	(-8.794)	(-8.822)
Firm ROA	-0.006	-0.005
	(-0.389)	(-0.384)
Firm Working capital	0.048***	0.048***
	(2.734)	(2.726)
Firm Cash	0.109***	0.109***
	(5.878)	(5.892)
Firm Debt	-0.033***	-0.033***
	(-7.047)	(-7.155)
Bank Size	0.098	0.099
	(0.742)	(0.424)
Deposit	-0.246	-0.229
	(-0.628)	(-0.530)
NPL	0.232	0.304
	(1.223)	(1.132)
Bank ROA	-2.672	-2.871
	(-1.592)	(-1.437)
Liquidity ratio	-0.341	-0.314
	(-1.129)	(-0.930)
Fees and commissions	-0.032	-0.027
	(-0.129)	(-0.087)
Bank Capitalitation	1.815**	1.938*
	(2.026)	(1.819)
RWA	0.349	0.399
	(1.320)	(1.227)
Bank Provisions	6.194	6.911
	(1.015)	(1.103)
Moratoria	-0.398***	-0.398***
	(-3.774)	(-3.741)
CB Liquidity	-0.446**	-0.471**
	(-2.066)	(-2.188)
Observations	2,130,020	2,130,020
R-squared	0.601	0.602
Bank FE	YES	YES
ILS*Quarter FE	YES	YES
Cluster	Firm Bank	Firm Bank
N. Banks	84	84
N. Firms	305,290	305,290

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