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Monetary policy, market power and Risk Shifting : does bailout matter in Tunisian banking sector?

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Outline

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General background

▶ **Since Tunisia's political change, the conduct of monetary policy by the Central Bank of Tunisia (CBT) has experienced a historic turning point as it has implemented a full allotment policy starting from July 2011.**

▶ **The objective of this policy was to resolve the problem of the dry-up of bank liquidity, preserving the financial stability and strengthening the resilience of the productive sector in the face of the shocks it faces.**

▶ **Like several countries, during the period 2011-2021, the Tunisian government employed also these two types of State aid**

  ▶ **State aid has been concentrated on recapitalizing of three public banks (enactment of Law No. 31-2015)**

    ● Capital increase amounting to **757 M dinars** for the **STB bank**

    ● Capital increase amounting to **90 M dinars** for the **BH bank**

    ● For the **BNA**, the government transformed its debt structure into shares in its capital for an amount of **80 M dinars**

    ● For the **STB**, the government has decided to allocate an endowment of **100 M dinars** to enhance the equity capital.

  ▶ **Program liquidity support** (short-term and longer-term refinancing operations (1, 3 and 6 months), the 24-hour standing loan facility or the currency swap)

General background

► **The state aid issue for the banking sector has been the subject of much academic and political debate, especially after the 2007-2008 financial crisis, where several banking sectors have been supported through several state aids programs: implicit & explicit:**

► **Implicit State aid**

- Liquidity support

► **Explicit Stae aid**

- Blanket guarantees

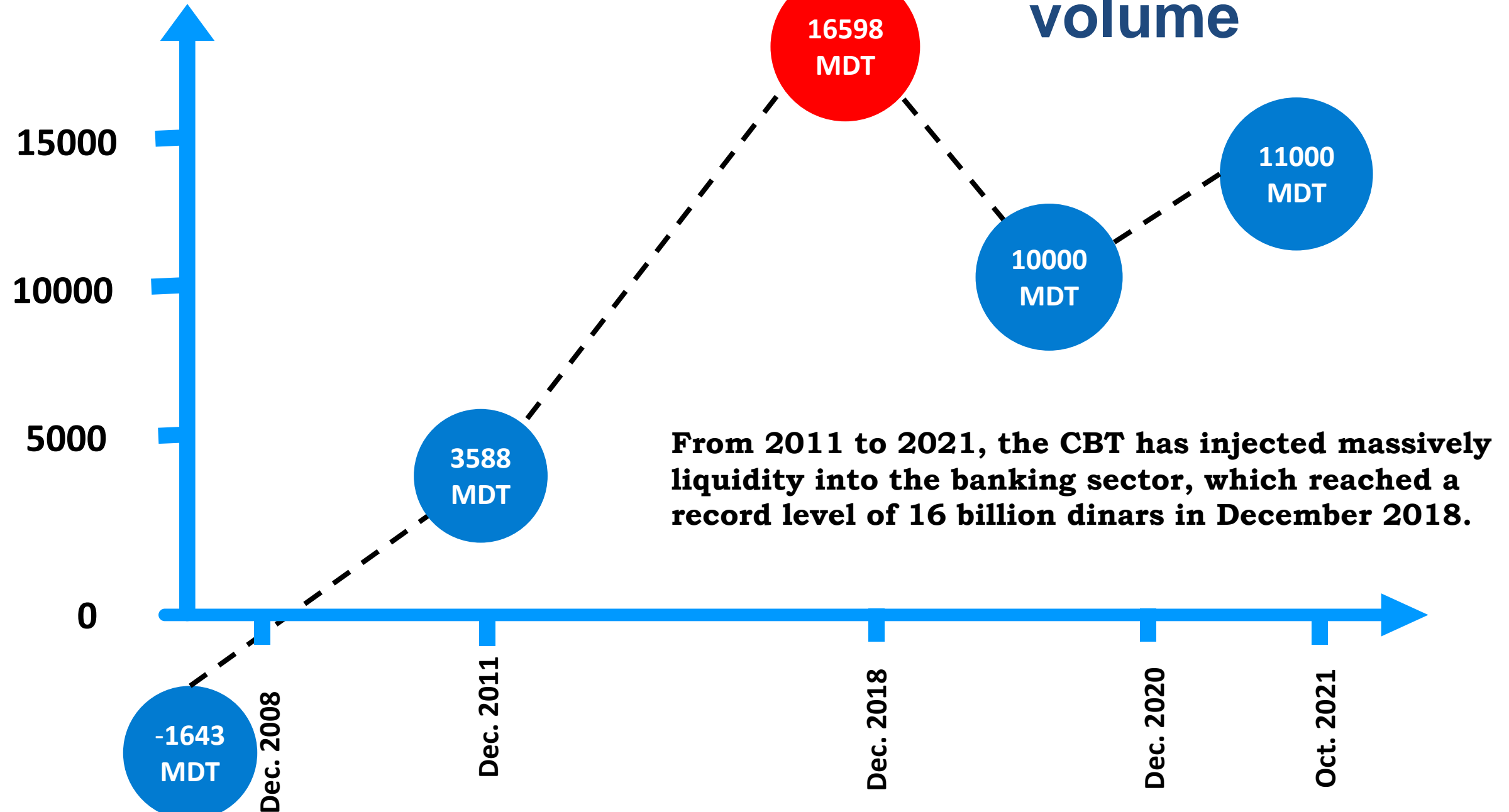- Recapitalization

- Nationalizations

General background

► **As much as these aids helped banks to refinance themselves at lower rates, they were also likely to distort competition among banks by inducing them to take on more risk (Beck, 2010)**

  ► **Public authorities faced the dilemma of either avoiding bank failure or reinforcing moral hazard. The fact remains that rescuing banks in the name of financial stability is costly for both the government and the taxpayer.**

  ► **These implicit subsidies could also have a dissuasive effect on bank's shareholders, who would feel less concerned with monitoring managers' behavior and would encourage excessive risk-taking through heavier debts.**

  ► **Under this perspective, the issue of rationing and controlling such state aid is necessary to address the distortion of fair competition that resulted from such aid. This control aimed thus at monitoring government interventions and strengthening competition (Beck, 2010; Hasan & Marinč, 2016).**

General background

State aid

Implicit state aid

Explicit state aid

Full allotment policy

Liquidity support

Recapitalization
BNA, STB & BH

Blanket guarantees

General background

Global refinancing volume

From 2011 to 2021, the CBT has injected massively liquidity into the banking sector, which reached a record level of 16 billion dinars in December 2018.

- 16598 MDT
- 11000 MDT
- 10000 MDT
- 3588 MDT
- -1643 MDT

15000
10000
5000
0

Dec. 2008
Dec. 2011
Dec. 2018
Dec. 2020
Oct. 2021

Literature revue

From a theoretical viewpoint, state aid could affect market power and bank risk.

Relationship

Empirical studies

Relationship
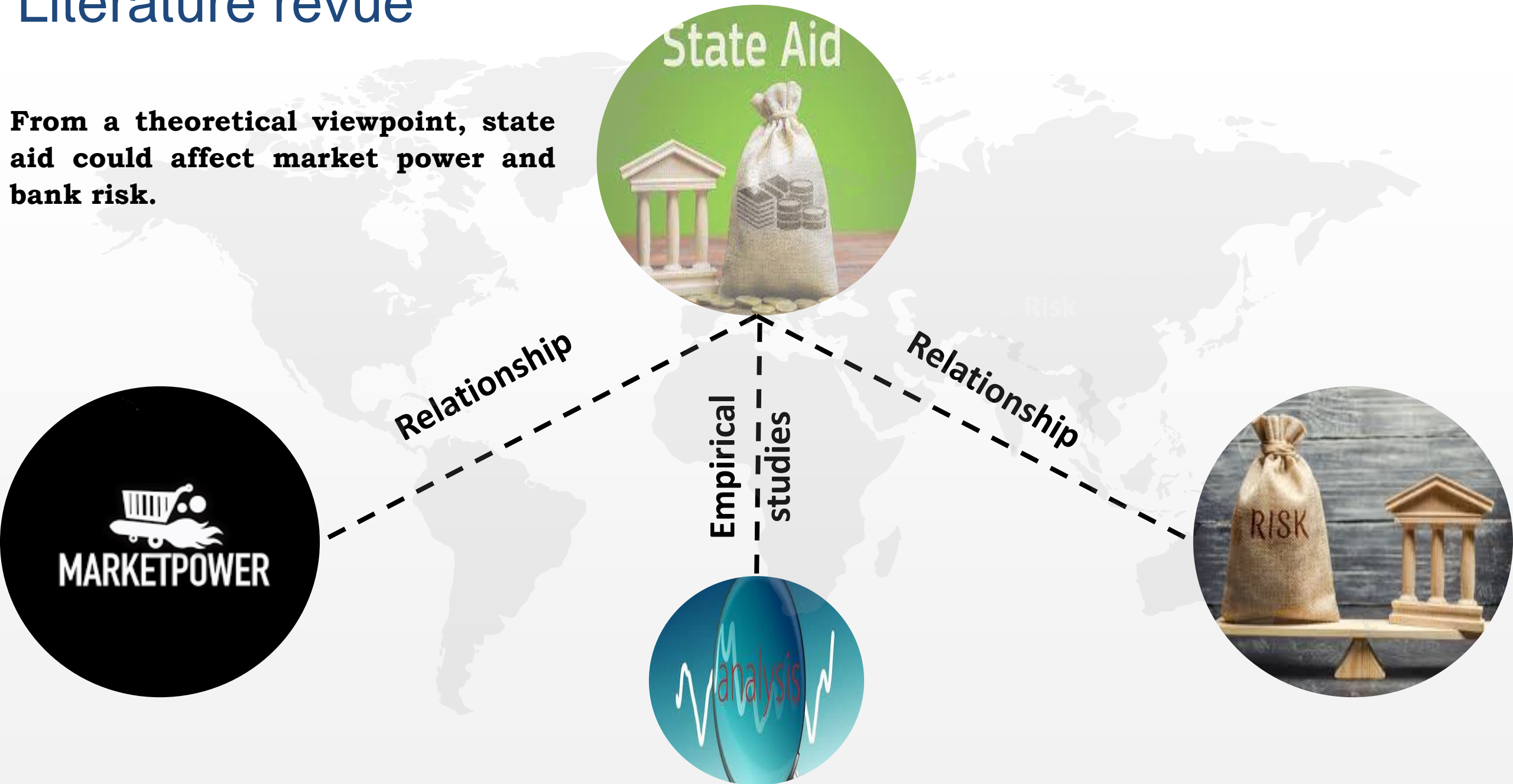
Theoritical Framework

Berger & Roman (2015)

Bank bailouts could decrease the market power, creating a *level playing field*

Bank bailouts could increase market power, creating a competitive distortions or an *uneven playing field*

Decrease MP

Increase MP

Level playing field

Uneven playing field

Channels
Predation
Decreased-moral-hazard
Stigma
Cost-disadvantge

Channels
Safety
Increased-moral-hazard
Charter value/quiet life
Cost-advantage

Theoritical Framework

Berger & al (2020)

State aid can reduce the risk-taking of bailed-out banks, enhancing *financial stability*

State aid can increase the bank risk-taking, increasing *financial fragility*

Stability

Fragility

Channels
Capital Priority
Decreased-moral-hazard
Charter value/quiet life
Stigma
Cost-disadvantge

Channels
Capital Cushion
Increased-moral-hazard
Prediction
Safety
Cost-advantage
TBTF, TITF, TMTF

Empirical studies

Results obtained by the different studies are mixed about the effects of state aid on market power and bank risk.

Relationship · **Relationship**

MARKETPOWER · State Aid · Risk

−	**+**	**+**	**−**
Calderon & Schaeck (2012): S-Aid forms considered : 1- blanket guarantees, 2-liquidity support, 3- recapitalizations, 4- Nationalizations	Berger & Roman (2015) Koetter & Noth (2016) : Liquidity support (TARP)	Brandao-Marques et al. (2013) : Liquidity support Dam & Koetter (2012) : Liquidity support Duchin & Sosyura (2014): Liquidity support (TARP)	Gropp et al. (2011) Berger et al. (2016) Berger et al. (2020) : Liquidity support (TARP)

Empirical studies used serval forms and measures of bailout (blanket guarantees, liquidity support, recapitalizations, and nationalizations).

Methodology

Data

Sample	Period	Sources
20 banks	2011-2020	CMF & CBT

400 bank-year observations

Methodology
Variables & econometric models

Baseline model

$$Risk_{it} = f\left(Bailout, CAMEL, Macroeconomics\right)$$

$$Market\ power_{it} = f\left(Bailout, CAMEL, Macroeconomics\right)$$

Our baseline model is then written as follows. Dependent variables can be either market power or bank risk, as a function of:

- Bailout
- CAMEL: Variable related to bank's characteristics
- Macroeconomic: macro-economic variables.

Formally, this model is regressed in three steps.

Methodology

econometric models: the first step aims to predict bailout probability. To do so, we use the logit model.

Prediction of Bailout probability

$$\log\left(\frac{P(BR_{it}=1)}{1-P(BR_{it}=1)}\right) = \alpha_i + \sum_{k=1}^{6}\alpha_k X_{ki,t-1} + \sum_{p=1}^{3}\beta_p X_{pi,t-1} + \varepsilon_{it}$$

Logit model

Variables

$\log\left(\frac{P(BR_{it}=1)}{1-P(BR_{it}=1)}\right) =$ is a dummy variable that takes 1 if the bank will obtain additional refinancing from the CBT in case it faces large unanticipated losses that would be likely to cause a bankruptcy risk and takes zero otherwise, denoted as Bailout,

$X_{k,i,t-1}$: control variables (variables CAMELS);

X

Choice of bailout probability

To estimate the bailout probability, we use two main elements:

- Amount of refinancing paid to banks
- Threshold at which a bank is considered a failing bank (lack of liquidity).

In this case, we consider a bank to be in distress when the refinancing to total deposits ratio exceeds the threshold at 10%.

Methodology

econometric models: the **second step** is to analyze the effect of the bailout probability on market power.

Bailout probability & Market power

$$Lerner_{it} = \alpha_i + \beta_1 Bail\hat{o}ut_{it-1} + \sum_{k=2}^{8} \beta_k X_{k,it-1} + \varepsilon_{it}$$

Variables	Estimation technique
Lerner : Lerner index **Bailout** : bailout probability **X** : control variables (SP, Size, LTA, CTA, ROA & GDPG)	To do this, we use FGLS method to resolve the heteroskedasticity, and autocorrelation problems.

Methodology

econometric models: the **third step** aims to examine the effect of bailout probability on bank risk

Bailout probability & Risk

$$Risk_{it} = \alpha_i + \beta_1 Bai\hat{l}out_{it-1} + \sum_{k=2}^{8} \beta_k X_{k,it-1} + \varepsilon_{it}$$

Variables	Estimation technique
Risk : non-performing loans, or Zscore **Bailout** : bailout probability **X** : control variables (SP, Size, LTA, CTA, ROA & GDPG)	To do this, we use FGLS method to resolve the heteroskedasticity, and autocorrelation problems.

Results & discussion
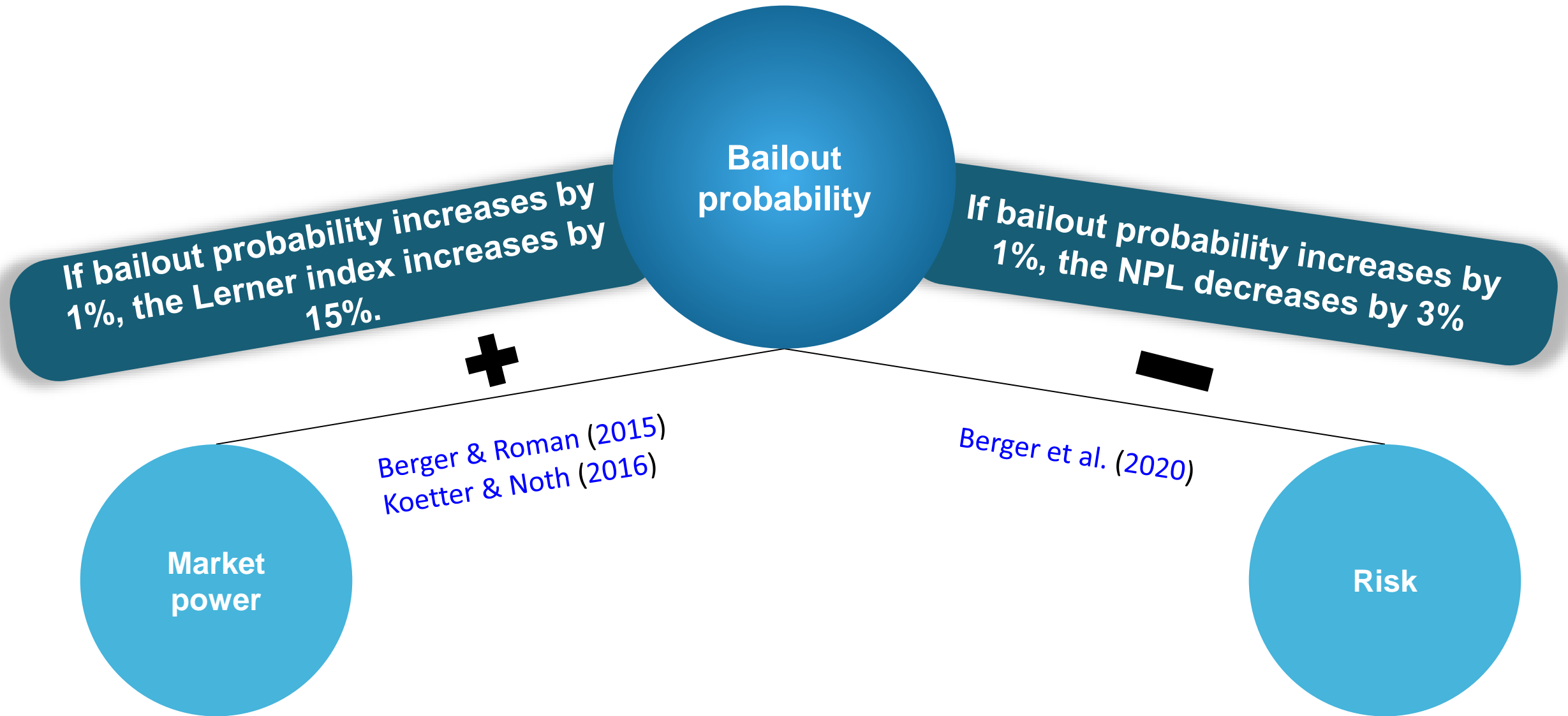
Bailout probability

If bailout probability increases by 1%, the Lerner index increases by 15%.

If bailout probability increases by 1%, the NPL decreases by 3%

+

−

Berger & Roman (2015)
Koetter & Noth (2016)

Berger et al. (2020)

Market power

Risk

Variables	BR
$RECAP_{t-1}$	-2.231***
	(0.495)
$ELEC_{t-1}$	5.888***
	(1.445)
LTA_{t-1}	4.734***
	(1.699)
CTA_{t-1}	1.814*
	(1.037)
DTA_{t-1}	3.582**
	(1.478)
NPL_{t-1}	-2.079***
	(0.653)
$Size_{t-1}$	0.597***
	(0.173)
ROA_{t-1}	11.56***
	(1.448)
$GDPG_{t-1}$	0.587**
	(0.243)
PS_{t-1}	0.426***
	(0.051)
Constant	-2.208***
	(0.552)
Observations	380
F-value	49.59

Bailout Regression Results
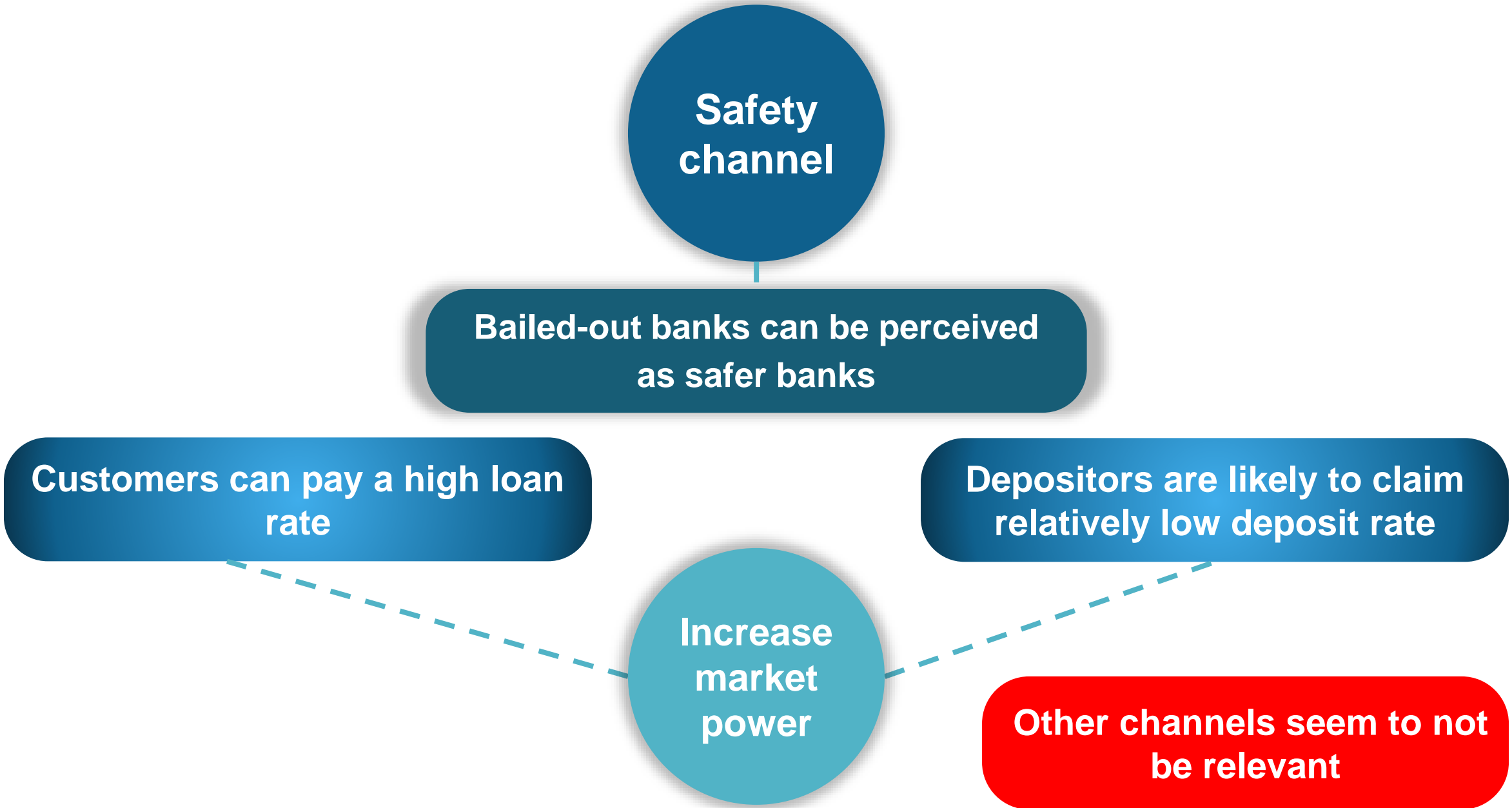
Bailout Regression Results

▶ **Bailout regressions results of step 1, showing the predicting signs. Specifically, the financial and political variables are significantly correlated with bailout probability.**

▶ The results indicate that the financial and political variables significantly correlate with bailout probability.

● During the election period, banks were more likely to receive bailouts.

● During public banks' recapitalization period, banks were less likely to receive liquidity support. This may be because, during this period, monetary policy authorities could help troubled banks.

● For the marginal effects of the financial variables (CAMELS), they show the expected signs. Liquidity (LTA) and capitalization (CTA), deposits level (DTA) and performance (ROA) have a positive effect on our dependent variable.

VARIABLES	(1) Lerner	(2) Lerner	(3) Lerner	(4) Lerner	(5) Lerner	(6) Lerner
$Bailout_{t-1}$	0.255***	0.268***	0.254***	0.261***	0.265***	0.283***
	(0.027)	(0.027)	(0.026)	(0.026)	(0.026)	(0.026)
NPL_{t-1},	-0.111*	-0.144**	-0.113*	-0.149**	-0.117*	-0.198***
	(0.066)	(0.071)	(0.065)	(0.063)	(0.066)	(0.068)
PS_{t-1},	0.051***	0.049***	0.054***	0.057***	0.059***	0.062***
	(0.010)	(0.010)	(0.010)	(0.009)	(0.011)	(0.009)
$Size_{t-1}$,	-0.018***	-0.022***	-0.025***	-0.025***	-0.020***	-0.031***
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
LTA_{t-1},		0.058				0.073**
		(0.038)				(0.036)
CTA_{t-1},			0.043***			0.008
			(0.010)			(0.020)
ROA_{t-1},				-0.286***		-0.279**
				(0.053)		(0.116)
$GDPG_{t-1}$,					-0.968***	-0.967***
					(0.286)	(0.283)
Constant	0.332***	0.322***	0.388***	0.404***	0.362***	0.420***
	(0.047)	(0.049)	(0.045)	(0.042)	(0.047)	(0.043)
Observations	380	380	380	380	380	380
Number of banks	20	20	20	20	20	20
Hausman test	6.54	7.31	8.35	6.54	11.89	10.47
p-value	0.089	0.063	0.682	0.886	0.104	0.234
Wald Test	1033.88	1048.93	1168.03	1316.68	1061.01	1376.83
p-value	0.000	0.000	0.000	0.000	0.000	0.000
Heteroskedasticity test	57.67	53.73	52.93	54.96	52.38	46.34
p-value	0.000	0.000	0.000	0.000	0.000	0.000
Autocorrelation Test	9.547	9.703	9.638	8.376	9.760	9.400

Bailout probability & Market power regression results

▶ **Our findings show that bailout probability has a positive impact on Lerner index.**

▶ **These results are certainly economically significant. Based in the coefficient of bailout variable (which is 0.283) reported in column 6, if bailout probability increases by 1%, the Lerner index increases by 15%.**

● To calculate this percentage, we used elasticities, calculated at the sample mean point, whose formula is as follows: $E^p_{X_k} = (1-p)X_k\alpha_k$, where p is the predicted Lerner index and   is mean Lerner index, and is the coefficient associate related to bailout.

Discussions of results of bailout-market power nexus

Safety channel

Bailed-out banks can be perceived as safer banks

Customers can pay a high loan rate

Depositors are likely to claim relatively low deposit rate

Increase market power

Other channels seem to not be relevant

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Discussions of results of bailout-market power nexus

► **This finding may be driven essentially by the _safety_ channel, i.e., that bailed-out banks can be perceived as safer bank.**

► More specifically, the safety channel is particularly important for most SMEs in

Tunisia because of their high dependence to bank financing due to their low capitalization.

- SMEs are constrained to pay high loan rates because they considered that some of these charges as an insurance premium against a sudden break-up in funding from the bailed-out banks.

- Depositors are likely to claim relatively low remuneration on their deposits because they consider bailed out banks as safers and thus able to satisfy customer demands for withdrawal of funds.

► Finally, in the Tunisian context, our findings are attributed to the fact that the other channels do not seem relevant (cost advantage,) as they are not operational due to the instruments used by the CBT to conduct its bailout policy.

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| VARIABLES	(1) NPL	(2) NPL	(3) NPL	(4) NPL	(5) NPL	(6) NPL	(7) NPL
$Bailout_{t-1}$,	-0.050**	-0.052**	-0.052**	-0.049**	-0.051**	-0.056***	-0.0310**
	(0.021)	(0.021)	(0.021)	(0.021)	(0.022)	(0.022)	(0.012)
PS_{t-1}	0.021***	0.020***	0.020***	0.021***	0.021***	0.020***	
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	
$Bailout \times PS_{t-1}$							-0.719***
							(0.184)
$Size_{t-1}$	-0.013***	-0.016***	-0.012***	-0.013***	-0.013**	-0.016***	-0.012***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
LTA_{t-1}		0.039*				0.038*	0.042***
		(0.020)				(0.021)	(0.0144)
CTA_{t-1}			-0.010			-0.027	0.005
			(0.010)			(0.017)	(0.003)
ROA_{t-1}				-0.027		-0.161	0.107**
				(0.066)		(0.100)	(0.050)
$GDPG_{t-1}$					0.070	0.155	-1.053***
					(0.154)	(0.161)	(0.192)
Constant	0.189***	0.190***	0.189***	0.189***	0.188***	0.187***	0.183***
	(0.009)	(0.010)	(0.009)	(0.009)	(0.010)	(0.010)	(0.0286)
Observations	380	380	380	380	380	380	380
Number of banks	20	20	20	20	20	20	20
Wald Test	117.78	120.59	118.95	117.21	116.53	124.32	195.02
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Heteroscedasticity test	55.11	46.80	54.54	56.34	55.15	47.36	57.23
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Autocorrelation test	252.67	208.61	247.43	248.96	250.50	213.02	219.17
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bailout probability & Risk regression results

▶ **The results obtained from step 3 show that bailout probability has a negative impact on bank risk measured by NPL.**

▶ **These results are certainly economically significant. Based in the coefficient of bailout variable (which is -0.056) reported in column 6, if bailout probability increases by 1%, the NPL decreases by 3%.**

● To calculate this percentage, we used elasticities, calculated at the sample mean point whose formula is as follows: $E_{X_k}^p = (1-p)X_k\alpha_k$, where p is the predicted Lerner index and   is mean Lerner index, and is the coefficient associate related to bailout.

Discussions of results of bailout-risk nexus
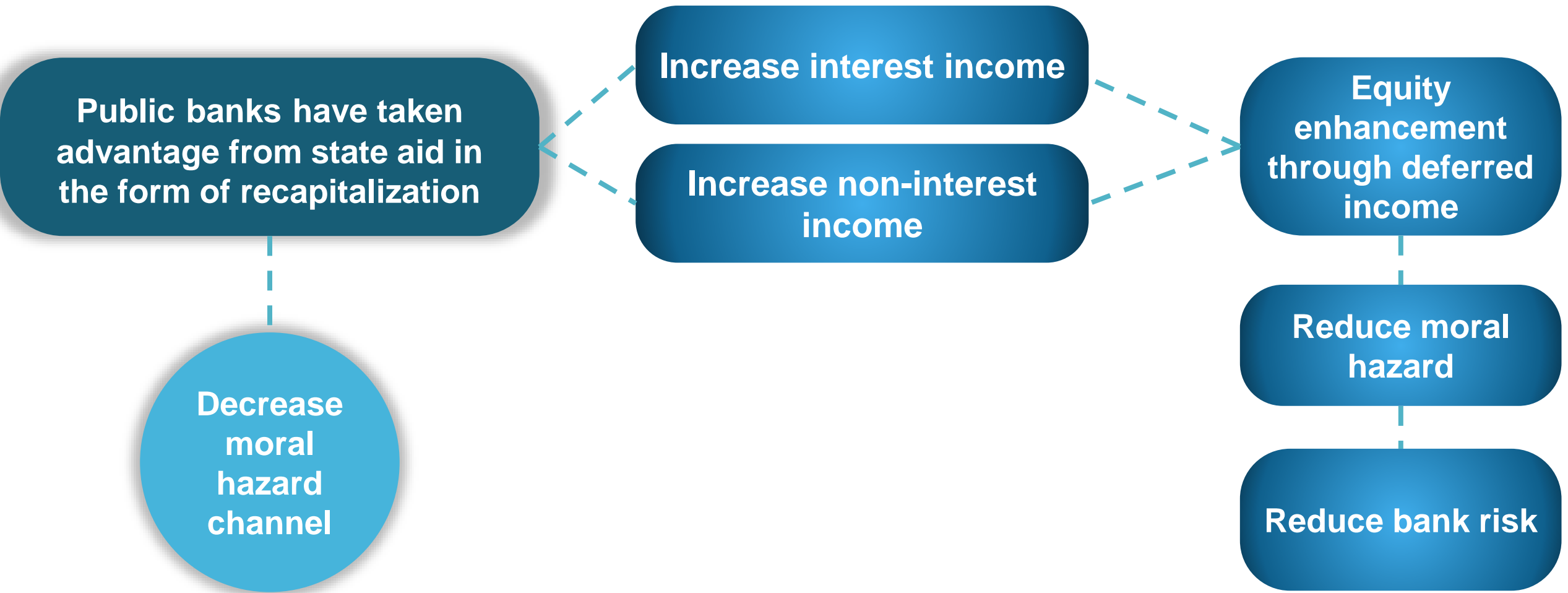
Discussions of results of bailout-risk nexus

► **In addition, the estimated coefficient related to interaction variable (between bailout probability and ownership structure (PS)), see column 7, has a negative effect on bank risk.**

► This result is explained by the fact that the first three public banks have taken advantage from recapitalization, which allowed them to increase their interest income and no-interest income. This income increase allowed these banks to increase their provisions to cover their credit and market risks and to increase their capital through deferred income. Therefore, equity enhancement is likely to reduce moral hazard and thus bank risk.

► **In sum, our results may be driven primarily by the decrease moral hazard channel.**

Recommandations

Recommandations

CBT Improve its reporting on its liquidity support program by disclosing information (amount, interest rate…) on bailed out banks

In the time of covid-19, State aid should be analyzed differently, by accepting more risk and more market power to preserve productive firms

Once the Tunisian economy is stabilized, CBT must pay more attention to the consideration of competition between banks to restore a level playing field,

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Thank you for your attention!