China's State-Owned Enterprises Reform: The Impact of Private Shareholding on Corporate Performances

PPOL 768 RESEARCH PROPOSAL PRESENTATION

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Agenda

Project Background: Context & Motivation

- China's State-owned Enterprises (SOEs): A Brief Overview
- Policy Solution: Mixed-ownership Reform
- Problem Statement

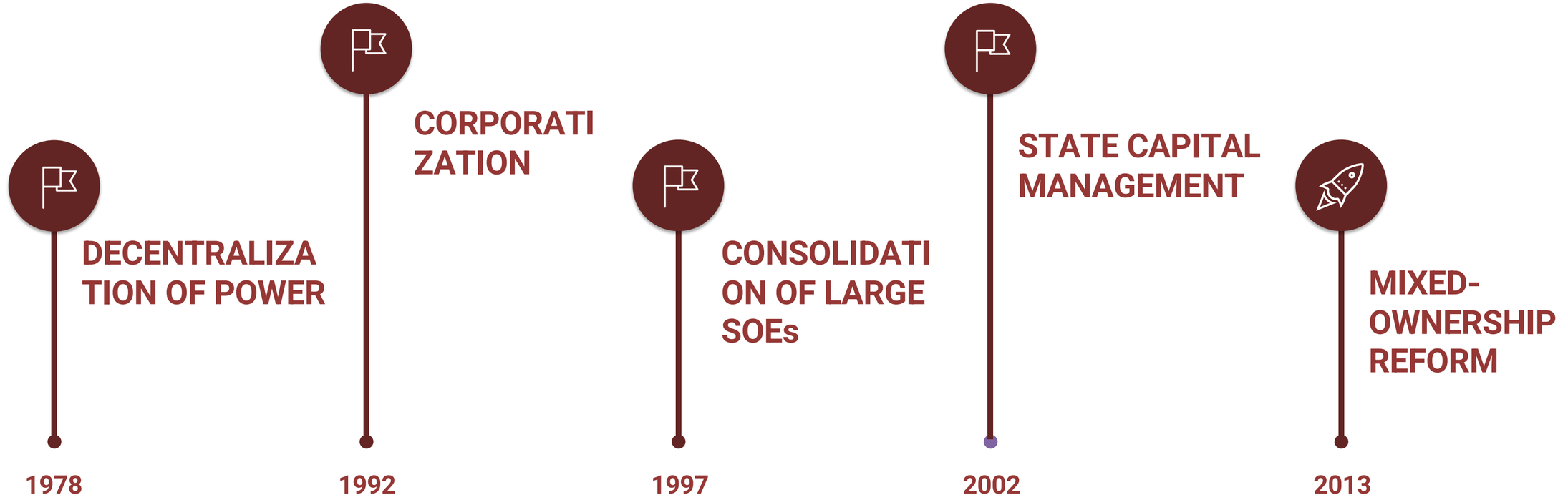
China's State-owned Enterprises (SOEs): A Brief Overview

WHAT	**What is an SOE?**
HOW	**How do SOEs function in the economy?**
WHY	**Why is there a need for mixed-ownership reform?**

The Classification of SOEs in China	
SOEs	**Examples**
Central SOEs	Aluminum Corporation of China Limited, China Minmetals Corporation, China Nonferrous Metal Mining (Group) Co., Ltd., etc.
Local SOEs	Bailian Group, Jinjiang International Holdings Co., Ltd., etc.
Entities supervised by MOF	China Publishing Group Corp, China Arts and Entertainment Group Ltd, China Railway, etc.
Financial institutions controlled by Huijin	Industrial and Commercial Bank of China (ICBC), Agricultural Bank of China (ABC), China Construction Bank (CCB), Bank of China (BOC), etc.

Source: Citic China Securities Research, Asia Briefing

Policy Solution: Mixed-Ownership Reform



Timeline of SOE reforms

Problem Statement

- Scope of the study
- Relevance of the study
- Research Questions

Data & Methodology

- Data
- Model & Hypothesis
- Methodology

Data

•**Source:** The data of this research comes from the China Stock Market & Accounting Research Database (CSMAR) database, which contains the stock data of all companies listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange.

•**Characteristics:** All collected data (all required variables in the model) will form panel data spanning from 2004 to 2019. The time span of the panel data is in units of year. Considering that the 2020-2022 Covid-19 epidemic in China will seriously bias the analysis of policy effects, we will choose to ignore the data for these three years.

•**Sample:** After simply processing the data, we found that there are 2,386 companies listed on the Shanghai and Shenzhen stock exchanges with state-owned shares, of which 670 belong to the treatment group if the threshold is 0.5.

Control Variables

Control Variable	Description	Calculation
Sales growth	The % increase in sales over selected periods	Sales growth rate = ((Current period sales - Previous period sales) / Previous period sales) x 100%
Loss indicator	A binary variable that indicates whether a company has incurred a net annual loss	Loss indicator = 1 if net loss is incurred, 0 otherwise
Market value	The current market value of a company's equity	Market value = Current stock price x Number of outstanding shares
Change in EPS	The percentage change in a company's earnings per share (EPS) over a certain period	Change in EPS = [EPS at t (lag_EPS) - EPS at t-1] / EPS at t-1 x 100%
Debt to asset	The ratio of a company's total debt to its total assets	Debt to asset ratio = Total liabilities / Total assets
Book to market	The ratio of a company's book value of equity to its market value of equity	Book to market ratio = Book value of equity / Market value of equity

Model & Hypothesis

$$CAR_{i,t} = \beta_0 + \beta_1 \times Post_{i,t} + \beta_2 \times Treatment_{i,t} + \beta_3 \times Post * Treatment_{i,t} + \beta_4 \times SalesGrowth_{i,t} + \beta_5 \times LossIndicator_{i,t} + \beta_6 \times LogMarketvalue_{i,t} + \beta_7 \times ChangeInEPS_{i,t} + \beta_8 \times DebtToAssets_{i,t} + \beta_9 \times BookToMarket_{i,t} + \epsilon$$

H_0: China's 2015 SOE/Ownership Reforms has no effect: $\beta_3 = 0$
H_1: China's 2015 SOE/Ownership Reforms has effect: $\beta_3 \neq 0$

Methodology: Difference in Difference (DiD)

AVERAGE OUTCOME	Before	After	Difference
No Treatment	***A***	***B***	B – A
Treatment	***C***	***D***	D – C
Difference	C – A	D – B	((D – C) – (B – A)) = ((D – B) – (C – A)) = ***Diff-in-Diffs Estimate***

$$Y = \beta_0 + \beta_1(After) + \beta_2(Treat) + \beta_3(After*Treat) + e$$

AVERAGE OUTCOME	Before	After	Difference
No Treatment	β_0	$\beta_0 + \beta_1$	β_1
Treatment	$\beta_0 + \beta_2$	$\beta_0 + \beta_1 + \beta_2 + \beta_3$	$\beta_1 + \beta_3$
Difference	β_2	$\beta_2 + \beta_3$	β_3

Post & Treatment

	Post	Treat
Data from 2004-2015	0	
Data from 2016-2019	1	
None of 2016-2019 treatment index < 0.5		0
One of 2016-2019 treatment index < 0.5		1

Treatment Example

Treatment Index: This index is equal to the proportion of the company's state ownership (from 2016 to 2019) in that year divided by the status in 2015.

Company A with 90% state ownership in 2015

Treat = 1 for index in 2018 & 2019 < 0.5

Time	State ownership proportion	index
2016	90%	1
2017	70%	0.78
2018	40%	0.44
2019	20%	0.22

Company B with 60% state ownership in 2015

Treat = 0 for no index < 0.5

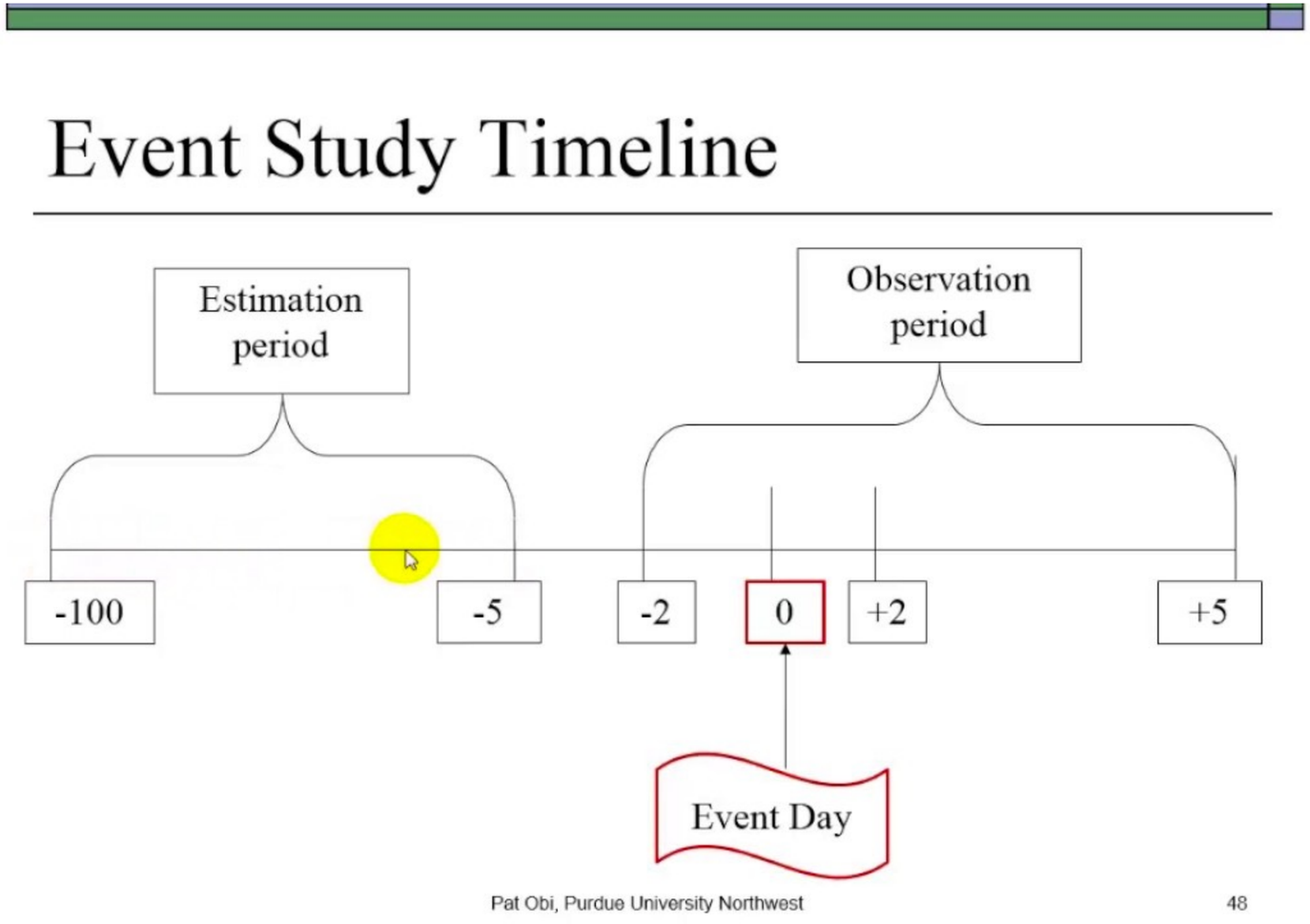
Time	State ownership proportion	index
2016	60%	1
2017	50%	0.83
2018	40%	0.67
2019	40%	0.67

Methodology: Event Study

The cumulative abnormal return (CAR) of stocks is the value used to judge whether the company has changed in the event study method.

The short-term event research method relies on three basic assumptions:

1. According to the efficient market hypothesis, the financial market is efficient;
2. The event under study is not expected by the market;
3. There is no mixed effect of other events during the window period of event occurrence.



- **The estimation period is the time period used to estimate the expected returns of the asset.**
- **The observation period is the time period over which the abnormal returns are calculated and analyzed.**

Model Specifications

	Regression 1	Regresion 2
CAR	Each firm has only two different CAR values, one for the entire pre-treatment period and one for the entire post-treatment period.	Each firm have their annual CAR for each year.
Purpose	Allow us to better capture the overall long-term impact of policies	Focuses on observing short-term fluctuations in policy impacts
Bias Example	In 2018, due to the throes of reform, the overall abnormal return of the treatment group was significantly lower than that of the control group, and this situation was reversed in 2019 due to the positive effect, and this effect is expected to continue.	The policy has a strong lag effect, with no large positive effect until 2019.

CAR Calculation

1) **Calculate the expected return of the stock through the Capital Asset Pricing Model (CAPM):**

$$r = R_f + \beta \times (R_m - R_f)$$

- r is the expected return on the investment
- R_f is the risk-free rate of return (usually estimated as the yield on government bonds)
- R_m is the expected return of the overall market
- β is the asset's sensitivity to market risk. To calculate beta for a stock, the most commonly used method is regression analysis, which involves running a regression of the stock's returns against the returns of a market index, such as the S&P 500.

2) **Calculate the actual return of the stock (direct from CSMAR database).**
3) **Subtract the expected return from the actual return to get the abnormal return.**
4) **Summing the abnormal returns over the period we are interested in is the CAR we need.**

Project Feasibility

Complications

- **Selection bias**: If companies in the treatment and control groups are systematically different, the DID estimates may be biased. While the DID approach attempts to control for unobserved time-invariant factors, it cannot control for time-varying unobserved factors that may affect both the treatment assignment and the outcome variable (CAR).
- **Parallel trends assumption**: The DID approach relies on the assumption that the treatment and control groups would have followed parallel trends in the outcome variable in the absence of the treatment. If this assumption is violated, the DID estimates may be biased. We may conduct placebo tests or visually inspect pre-treatment trends to assess the plausibility of the parallel trends assumption.

Complications (cont.)

- **Policy spillover effects:** If the new policy has spillover effects on companies in the control group, the DID estimates may not accurately capture the true treatment effect. For example, the policy might lead to changes in industry dynamics or market structure that indirectly affect companies without significant changes in state-owned shareholding.
- **External validity:** The findings of this study may not be generalizable to other countries, industries, or time periods. The results may also depend on the specific policy being studied and its implementation. Caution should be exercised when extrapolating the findings to other contexts.
- **Limited time frame:** If the effects of the policy take longer to materialize than the time period considered in the study, the DID estimates may not fully capture the long-term impact of the policy. Expanding the post-treatment period or considering longer-term outcome measures in the future may help address this limitation.

THANK YOU