

# Bankruptcy Design

B. Espen Eckbo

2010

## Agenda

- **Auction as a bankruptcy process**
- Systemically important financial institutions
- Banking system bailout – Scandinavian style



## Bankruptcy systems, internationally

- UK – a “receivership system” (until 2003)
  - Strong protection of secured creditor rights
  - *Excessive piecemeal liquidations?*
- US – a “renegotiation system” (Ch. 11)
  - Stay of debt claims, DIP financing, voluntary sale
  - *Excessive continuation of old management?*
- Sweden – a “mandatory auction system”
  - Stay of all debt claims, DIP financing possible
  - *Excessive risk-shifting and fire-sales?*

Eckbo

Bankruptcy Design (45)

3



## U.S. milestones

- 1978: Creation of Chapter 11 ostensibly to avoid fire sales
- 1980/90s: Growing evidence that U.S. Ch. 11 is costly

*The U.S. bankruptcy system seems to be fundamentally flawed. It is expensive, it exacerbates conflicts among different classes of creditors, and it often takes years to resolve individual cases... [The] value of viable businesses is destroyed... in providing life support for terminal cases. -- Michael C. Jensen (1991)*

- 2000s: Market mechanisms lowering bankruptcy costs

Eckbo

Bankruptcy Design (45)

4

## Market mechanisms lowering bankruptcy costs

- Private workouts in "prepackaged" bankruptcy filings
- Debt markets - distressed bond ("vulture") funds
- Both developments has led to auction sales inside Ch. 11  
*When firms can be sold as going concerns, the need for the traditional negotiated plan of reorganization disappears... Today the Chapter 11 of a large firm is an auction of the assets, followed by litigation over the proceeds... [The era of] the law of corporate reorganizations... has come to an end.*

--Douglas G. Baird and Robert K. Rasmussen (2002)

Eckbo

Bankruptcy Design (45)

5

## Comparing control rights in bankruptcy

### **Mandatory Auction**

- Management loses control
- Firm is restructured by buyer in auction
- Cash settlement according to APR
- Stay of collateral, DIP financing rare

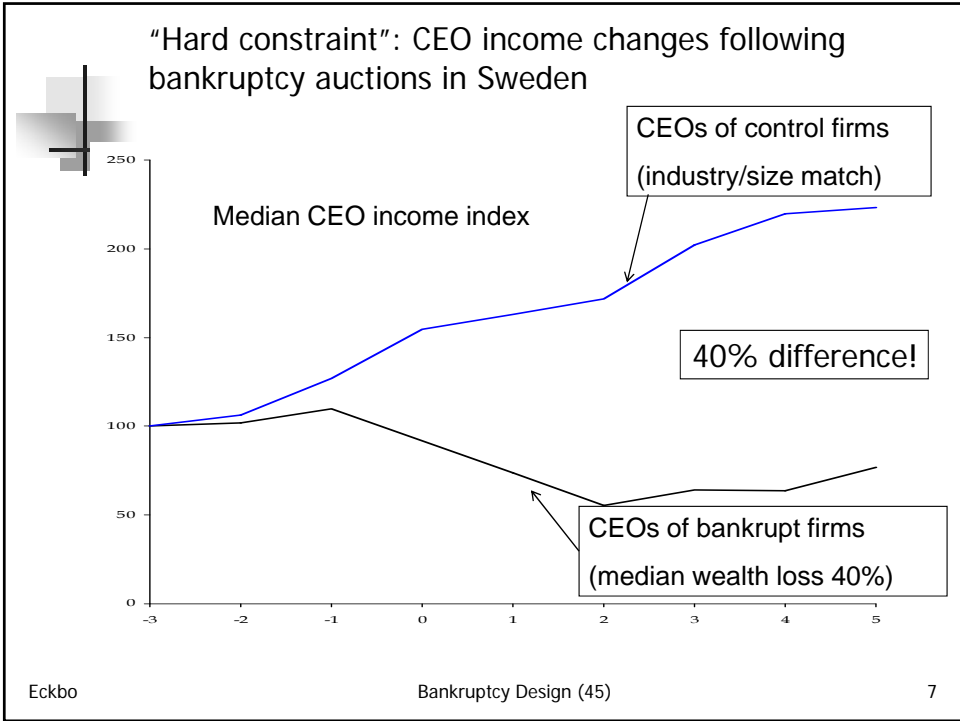
### **Renegotiation**

- Management retains control
- Firm is restructured by creditor consensus
- Securities payment, deviations from APR
- Stay of collateral, DIP financing frequent

Eckbo

Bankruptcy Design (45)


6



**Comparing duration, recovery, and survival**

Swedish Auctions	US Chapter 11
<ul style="list-style-type: none"> <li>Av. duration 2 months</li> <li>Total debt recovery 40%</li> <li>APR strictly enforced</li> <li>76% going concern sales</li> <li>Surviving firms perform at industry median</li> </ul>	<ul style="list-style-type: none"> <li>Av. duration 2 years</li> <li>Total debt recovery 40%</li> <li>Deviations from APR</li> <li>70% survive Chapter 11</li> <li>Surviving firms perform below industry median</li> </ul>

Eckbo Bankruptcy Design (45) 8



## Do auctions create fire-sale discounts?

---

- Auction demand may be temporarily low
  - Due diligence time pressure
  - Relatively efficient industry rivals may be cash constrained
  - Industry debt overhang – underinvestment incentives
- Result: winning bidder may be low-valuation (industry outsider)
  - If so, sales prices are temporarily low (discounted) relative to value of assets in best alternative use



## But...

---

- No evidence of fire-sale discounts in auctions where the bankrupt firm is bought as a going-concern
  - (Eckbo and Thorburn JFE 2008)
- Auction premiums unrelated to
  - Degree of industry-wide distress and liquidity
  - Whether buyer is industry outsider v. insider
  - Whether acquisition method is merger v. LBO
- Also no empirical support for self-dealing arguments

## “Fire-sale”: basic idea

- Auction demand is temporarily low
  - Time pressure
  - Auction requires cash payment, and relatively efficient industry rivals are cash constrained
  - Debt overhang and underinvestment incentives
- Result: winning bidder may be low-valuation (industry outsider)
  - If so, sales prices are temporarily low relative to value of assets in best alternative use

## Counter-arguments...

- Inefficient buyers may hire efficient industry insider to run the firm
  - If so, the acquisition price may be right
- Cash constraints and incentive effects of debt overhang may lead to “project financing”
  - “LBO financing” of acquisition price
- Severe prospect of inefficient liquidation may prompt prepackaged bankruptcy filing
  - Increases the effective period available to search for efficient buyer

## Our Swedish sample

- 258 bcy filings by private firms, 1988-1991
- Minimum 20 employees
- Average pre-filing assets of \$3 mill.
- Complete set of auction prices for going-concern sales and piecemeal liquidations
- Average going-concern premium: 125%
- 75% of firms sold as going concerns
  - 60% are salebacks; 25% are prepacks

Eckbo

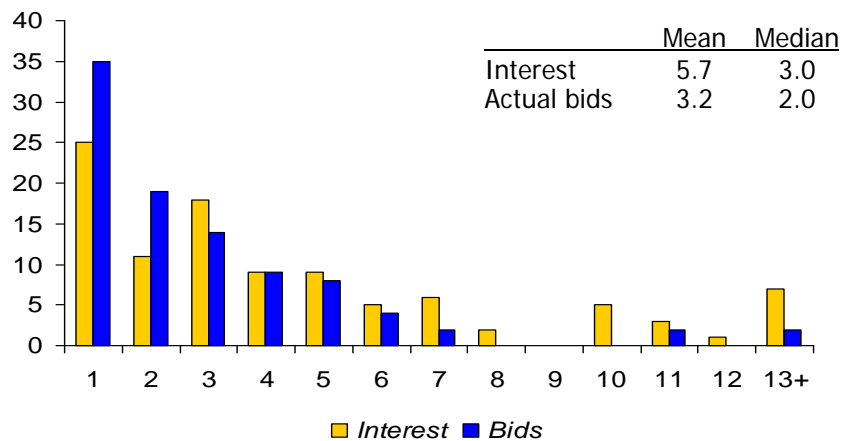
Bankruptcy Design (45)

13

## Bidder interest and actual bids

Frequency

147 going concern auctions, 1988-1991



Eckbo

Bankruptcy Design (45)

14

## Empirical approach

- Economic v. financial distress
  - Prices may be low because decreases in industry profits permanently lowers demand (economic distress)
- Step 1: Estimate “fundamental” price
  - $p^* = f(\text{asset size, profits, specificity, tangibility, PL})$ 
    - PL captures lack of going concern value
- Step 2: Estimate effect of fire-sale variables on model residual
  - $p - p^* = f(\text{industry liquidity, auction outcomes})$

Table 2  
Estimation of the fundamental auction price ( $p^*$ ) and auction debt recovery rate ( $r^*$ )

The cross-sectional regression models in Panel A and Panel B are, respectively,  $p = \beta_{1p}X_1 + \epsilon_{1p}$  and  $r = \beta_{1r}X_1 + \epsilon_{1r}$ , where  $p \equiv \ln(P)$ ,  $P$  is the total proceeds from the bankruptcy proceeding, and  $r$  is the debt recovery rate ( $r = (P - C)/D \in [0, 1]$ , where  $D$  is the face value of the target's debt and  $C$  is the direct costs of the bankruptcy proceedings). The fundamental auction price is defined as  $p^* \equiv \beta_{1p}X_1$ , and the fundamental recovery rate is  $r^* \equiv \beta_{1r}X_1$ . The table shows the OLS coefficient estimates  $\hat{\beta}_{1p}$  and  $\hat{\beta}_{1r}$ . Total sample of 258 Swedish firms filing for auction bankruptcy 1988-1991. Variable definitions for the regressors in  $X_1$  are given in Table 1 (p-values in parentheses).

Constant	Target asset characteristics									Industry conditions		Adjusted $R^2$	F-value
	Size	Asset sales	Profit	Profit *GC	Profit *PL	Specific *GC	Specific *PL	Intangible	PL	Ind Profit	Bus Cycle		
<b>A. Auction price regressions</b>													
5.44 (0.000)	0.67 (0.000)	-0.56 (0.000)	-0.46 (0.309)			-0.86 (0.048)	1.77 (0.055)	-1.61 (0.000)	-1.06 (0.000)			0.50	37.51 (0.000)
5.56 (0.000)	0.66 (0.000)	-0.56 (0.000)	-0.47 (0.295)			-0.91 (0.078)	1.67 (0.039)	-1.64 (0.000)	-1.07 (0.000)	1.99 (0.433)	-0.02 (0.435)	0.50	29.22 (0.000)
<b>B. Auction recovery rate regressions</b>													
0.73 (0.001)	-0.01 (0.461)	-0.04 (0.121)		0.30 (0.020)	-0.25 (0.031)	-0.09 (0.303)	0.28 (0.123)	-0.29 (0.000)	-0.18 (0.000)			0.18	8.22 (0.000)
0.76 (0.001)	-0.01 (0.275)	-0.04 (0.138)		0.25 (0.058)	-0.22 (0.061)	-0.10 (0.218)	0.20 (0.262)	-0.30 (0.000)	-0.18 (0.000)	1.03 (0.040)	-0.00 (0.306)	0.19	7.18 (0.000)



## Step 2: Fire-sale tests

- Do price residuals ( $p-p^*$ ) and recovery rate residuals ( $r-r^*$ ) vary with industry liquidity?
- Industry liquidity measures (4-digit SIC level):
  - Industry distress: fraction of 15,000 firms with and  $ICR < 1$  or filing for bankruptcy next year
  - Industry leverage: median debt-to-asset (book value) ratio in the industry
  - Number of firms in industry
- Auction outcome
  - Industry outsider vs. industry insider
  - Buyout vs. merger

Eckbo

Bankruptcy Design (45)

17

Table 3  
Determinants of auction price residuals ( $p - p^*$ ) and recovery rate residuals ( $r - r^*$ )

Coefficient estimates from OLS regressions of the standardized auction price residuals  $p - p^*$  (Panel A) and total debt recovery rate residuals (Panel B). The standardized residuals are from the first regression models in Panels A and B of Table 2, respectively. The explanatory variables are defined in Table 1 (p-values are in parentheses).

Con- stant	Industry liquidity conditions					Auction outcomes			Adj. $R^2$	F- value	N
	<i>Ind Distress</i>	<i>Distress +GC</i>	<i>Distress +PL</i>	<i>Ind Leverage</i>	<i>No of firms</i>	<i>PL</i>	<i>Out- sider</i>	<i>Buyout</i>			
<b>A. Auction price residual (<math>p - p^*</math>)</b>											
1.07 (0.103)	-0.50 (0.286)	-0.04 (0.946)	-1.88 (0.033)	-0.95 (0.273)	-0.57 (0.067)	0.00 (0.993)			0.01	1.52 (0.196)	258
0.88 (0.181)			-0.91 (0.294)	-0.59 (0.055)	0.60 (0.091)				0.02	1.92 (0.092)	258
0.88 (0.181)		-0.07 (0.895)	-1.88 (0.033)	-0.86 (0.319)	-0.59 (0.056)	0.57 (0.118)	-0.10 (0.541)		0.01	1.66 (0.132)	258
0.56 (0.454)		0.12 (0.854)	-2.03 (0.020)	-0.29 (0.756)	-0.69 (0.051)	0.50 (0.211)	-0.11 (0.558)	-0.12 (0.489)	0.02	1.51 (0.167)	204
<b>B. Auction recovery rate residual (<math>r - r^*</math>)</b>											
0.97 (0.138)	-0.67 (0.158)			-0.88 (0.312)	-0.21 (0.495)	-0.00 (0.993)			0.00	1.11 (0.350)	258
0.83 (0.209)		-0.32 (0.554)	-1.70 (0.054)	-0.84 (0.331)	-0.23 (0.456)	0.45 (0.207)			0.00	1.28 (0.272)	258
0.83 (0.209)		-0.35 (0.520)	-1.71 (0.053)	-0.81 (0.355)	-0.23 (0.461)	0.42 (0.247)	-0.08 (0.599)		0.00	1.11 (0.355)	258
0.31 (0.704)		-0.01 (0.985)	-1.76 (0.060)	-0.40 (0.694)	-0.18 (0.631)	0.63 (0.149)	-0.10 (0.631)	0.10 (0.583)	-0.01	0.69 (0.677)	204

Eckbo

Bankruptcy Design (45)

18

## Buyer industry affiliation

- Industry outsiders pay on average similar prices as industry insiders
  - No evidence of lower prices to “less efficient industry outsiders”
- Are prices sensitive to industry illiquidity measures for the subsample of industry outsiders?
  - Add interaction variables for industry distress across the going-concern subsamples

Eckbo

Bankruptcy Design (45)

19

Table 4

Tests for the impact of industry distress on price and recovery rate residuals conditional on buyer industry affiliation

The dependent variable in Panel A is the standardized auction price residuals  $p - p^*$  from the first regression in Panel A of Table 2. In Panel B, the dependent variable is the standardized recovery rate residuals  $r - r^*$  from the first regression model in Panel B of Table 2. *Insider* is the complement to *Outsider* in continuation sales, so that  $Outsider + Insider + PL = 1$ . All other variables are defined in Table 1 (p-values in parentheses).

Constant	Industry liquidity conditions					Auction outcomes			Adj. $R^2$	F-value	N
	<i>Ind Distress</i>	<i>Distress *Outsider</i>	<i>Distress *Insider</i>	<i>Distress *PL</i>	<i>Ind Leverage</i>	<i>No of firms</i>	<i>Outsider</i>	<i>PL</i>			
<b>A. Tests for the impact on the auction price residual (<math>p - p^*</math>)</b>											
1.15 (0.092)		1.17 (0.231)	-0.54 (0.381)	-1.84 (0.036)	-1.01 (0.249)	-0.56 (0.071)	-0.66 (0.102)	0.39 (0.301)	0.02	1.76 (0.096)	258
1.15 (0.092)	1.17 (0.231)		-1.72 (0.129)	-3.02 (0.018)	-1.01 (0.249)	-0.56 (0.071)	-0.66 (0.102)	0.39 (0.301)	0.02	1.76 (0.096)	258
<b>B. Tests for the impact on the recovery rate residual (<math>r - r^*</math>)</b>											
0.95 (0.165)		0.22 (0.826)	-0.56 (0.369)	-1.69 (0.056)	-0.87 (0.321)	-0.21 (0.491)	-0.34 (0.403)	0.34 (0.372)	0.00	1.02 (0.418)	258
0.95 (0.165)	0.22 (0.826)		-0.78 (0.493)	-1.91 (0.137)	-0.87 (0.321)	-0.21 (0.491)	-0.34 (0.403)	0.34 (0.372)	0.00	1.02 (0.418)	258

Eckbo

Bankruptcy Design (45)

20



## Summary

---

- Price residuals decrease with industry distress for piecemeal liquidations but not for going-concern sales
- Prices are lower in piecemeal liquidations
- Firms with intangible and specific assets:
  - Are less likely to be liquidated piecemeal
  - Are more likely to be sold to industry insider
  - Are more likely to be financed using LBO technique



## Liquidation preemption?

---

- Excessive liquidation and fire-sales may be preempted by a prepack or a saleback
- Prices in preemptive transactions should be
  - higher than in piecemeal liquidations  
(as going-concern value is preserved)
  - but lower than in regular going-concern sales  
(as buyer has more bargaining power)

**Table 6**  
**Determinants of auction price residuals ( $p - p^*$ ) and debt recovery residuals ( $r - r^*$ ) in prepacks and salebacks**

The standardized residuals  $p - p^*$  and  $r - r^*$  are from the first regression models in Panel A and Panel B, respectively, reported in Table 2. The explanatory variables are defined in Table 1 (p-values are in parentheses).

Con- stant	Industry liquidity conditions				Auction outcomes						Adj. $R^2$	F- value	N	
	<i>Distress</i> <i>+GC</i>	<i>Distress</i> <i>+PL</i>	<i>Ind</i> <i>Leverage</i>	<i>No of</i> <i>firms</i>	<i>PL</i>	<i>Prepack</i>	<i>Saleback</i>	<i>Prepack</i> <i>+Saleback</i>	<i>Prepack</i> <i>+Nonsale</i>	<i>Nonprepack</i> <i>+Saleback</i>				
<b>A. Auction price residual (<math>p - p^*</math>)</b>														
0.90 (0.164)	-0.09 (0.858)	-1.89 (0.028)	-0.74 (0.383)	-0.56 (0.062)	0.45 (0.202)	-0.52 (0.001)						0.06	3.55 (0.002)	258
1.06 (0.112)	-0.14 (0.794)	-1.89 (0.030)	-0.77 (0.375)	-0.57 (0.066)	0.31 (0.392)	-0.56 (0.001)	-0.17 (0.232)					0.06	3.37 (0.002)	251
1.06 (0.113)	-0.14 (0.795)	-1.89 (0.030)	-0.77 (0.377)	-0.57 (0.066)	0.31 (0.401)			-0.73 (0.001)	-0.56 (0.041)	-0.17 (0.296)		0.06	2.94 (0.004)	251
<b>B. Total recovery rate residual (<math>r - r^*</math>)</b>														
0.83 (0.207)	-0.33 (0.537)	-1.71 (0.053)	-0.80 (0.355)	-0.22 (0.470)	0.41 (0.251)	-0.12 (0.433)						0.00	1.17 (0.323)	258
0.99 (0.144)	-0.30 (0.593)	-1.70 (0.056)	-0.86 (0.334)	-0.23 (0.463)	0.29 (0.428)	-0.15 (0.350)	-0.18 (0.231)					0.01	1.27 (0.264)	251
0.99 (0.148)	-0.28 (0.616)	-1.70 (0.057)	-0.88 (0.321)	-0.23 (0.461)	0.32 (0.396)			-0.35 (0.117)	-0.06 (0.823)	-0.15 (0.396)		0.00	1.13 (0.342)	251

## Summary: liquidation preemption

- Evidence of lower prices in prepacks but not in salebacks
- The probability for a prepack:
  - Increases in asset specificity and intangibility
- The probability for a saleback:
  - Also increases in industry distress
- Is liquidation preemption risky?:
  - Examine refiling rates compared to non-prepacks

Table 9  
Bankruptcy refiling probability for targets sold as going-concern

Coefficients in logit estimations of the probability that the surviving firm refiles for bankruptcy within 2 years of the auction. The sample is 150 Swedish firms sold as going-concern in auction bankruptcy 1988-1991. P-values are in parentheses. Variable definitions are in Table 1.

Constant	Target asset characteristics				Industry conditions			Auction outcomes			Cox Snell $R^2$	Chi- square
	<i>Size</i>	<i>Profit</i>	<i>Specific</i>	<i>Intan- gible</i>	<i>Bus Cycle</i>	<i>Ind Distress</i>	<i>Ind Leverage</i>	$p - p^*$	<i>Outsider</i>	<i>Prepack</i>		
-2.42 (0.628)	-0.14 (0.577)	0.43 (0.837)	2.83 (0.015)	-1.12 (0.260)	-0.22 (0.012)	-5.32 (0.003)	6.90 (0.022)	-0.06 (0.794)			0.14	22.96 (0.003)
-2.79 (0.599)	-0.14 (0.601)	-0.66 (0.778)	2.78 (0.037)	-1.15 (0.149)	-0.22 (0.017)	-6.25 (0.001)	8.00 (0.012)	0.02 (0.932)	-1.46 (0.016)	1.35 (0.007)	0.21	35.01 (0.000)

## Conclusion

- Investors are pushing for auction-type procedures to resolve insolvency – against opposition
- Research support the use of auctions as a bankruptcy procedure
- A reform of U.S.-types of bankruptcy codes towards greater reliance on auctions is likely to enhance economic efficiency



## Agenda

---

- Auction as a bankruptcy process
- **Systemically important financial institutions**
- Banking system bailout – Scandinavian style



## What's different about banks?

---

- A “bank” is a state/federal authorized “franchise” – not a “corporation” – often holding separate legal entities:
  - Depository bank
  - Commodity broker/derivatives dealer
  - Futures commission merchant
  - Insurance company
  - Delaware corporations
  - Foreign corporations
- U.S. Bankruptcy Code does not address insolvency of banks, savings and loans, and credit unions




## U.S. failed bank resolution authorities

- Depository banks
  - FDIC acts as conservator/receiver (ResolutionTrust Corporation) – and typically uses auction
  
- Insurance companies
  - State insurance regulators
  
- Stockbrokers and commodity brokers (broker-dealers)
  - Securities Investor Protection Corporation (and Ch. 7)
  - Lehman: Brokerage accounts transferred to Barclays



## Qualified financial contracts (QFC)

- Mostly derivatives, swaps and repos
  
- Protected from the automatic stay provisions of the FDI Act and the U.S. bankruptcy code
  - Counterparties permitted to enforce default and termination provisions and to liquidate collateral
  - Remaining shortfall constitutes unsecured claim against bankruptcy estate
  
- The safe harbor of QFC helps reduce counterparty risk by promoting orderly netting-out and replacement transactions




## Counterparty reputation of dealer banks

- The one factor which allows dealer banks to collateralize derivative positions using over-night cash deposits (repos)
- Probably impossible to prevent client/counterparty “run” from a bank whose reputation is in weakened
  - Neither deposit insurance nor stay of claims work here
- Prior to their collapse in 2008, neither Bear Stearns nor Lehman Brothers dared reveal their liquidity problems by borrowing openly from Federal facilities – set up at that time precisely for the purpose of lowering counterparty risk

Eckbo

Bankruptcy Design (45)

31



## Contingent reverse convertibles: A solution?

- Subordinated debt instrument where the *issuer* (bank) has the option to force conversion into its own (newly issued) equity
- Raises core Tier 1 capital on a contingent basis
- BUT: Does not lead to capital infusion – only reduces leverage
- What should be the trigger?
  - Some suggest a declaration by the Fed of a systemic crisis
  - But then it is probably already too late
  - The conversion needs to take place in “good times” – how?

Eckbo

Bankruptcy Design (45)

32



## Reverse convertibles w/forced rights offer

- Idea: To force infusion of new equity from existing shareholders upon debt conversion
  - Again – conversion must take place before crisis point
- The threat: “Supply new equity capital – or you will be substantially diluted by convertible debtholders”
- Unresolved issues:
  - Optimal conversion trigger: Systemic component?
  - “Death spiral” from short-selling anticipating conversion?
  - Bond funds (who cannot hold equity) must sell immediately – will the market be deep enough?

## Conclusions

- Existing procedures for resolving bank insolvencies relies heavily on auctions and are therefore typically more efficient than corporate bankruptcy procedures (Ch. 11)
- It is unclear that current capital reserve requirements (even Basel III) is sufficient to hedge against the type of “rapid-fire” insolvency characterizing the deterioration of counterparty risk
- It is unclear that the idea of banks relying on reverse convertible securities to avoid default is a superior solution to outright forced auction



## Agenda

---

- Auction as a bankruptcy process
- Systemically important financial institutions
- **Banking system bailout – Scandinavian style**

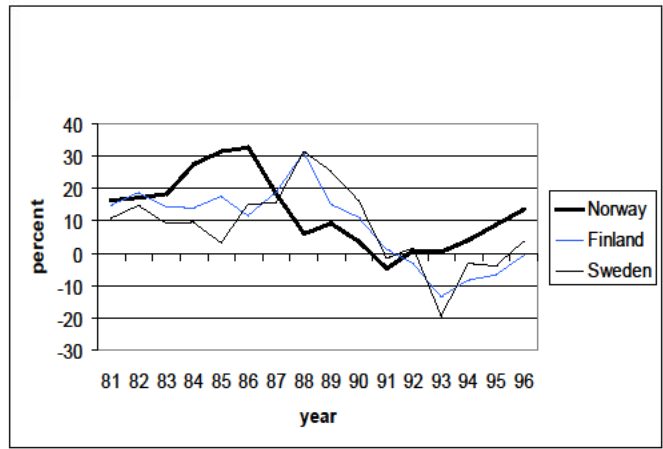


## Common path to banking crises

---

- More than 100 banking crises internationally over the past 40 years
- Path to crisis remarkably similar across countries with very different governance/political systems
  - Relaxation of bank lending standards
  - Household leverage increases – housing market heats up
  - Financial system fragility – exposed to exogenous economic shocks
- Also the path in Scandinavia late 1980s/early 1990s

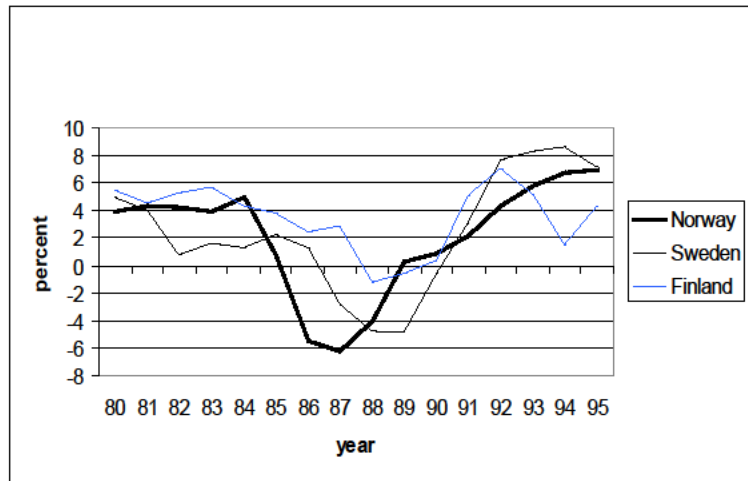
Figure 1: Annual percent growth in nominal lending by parent banks in Norway, Sweden and Finland, 1981-1996.



Eckbo

Bankruptcy Design (45)

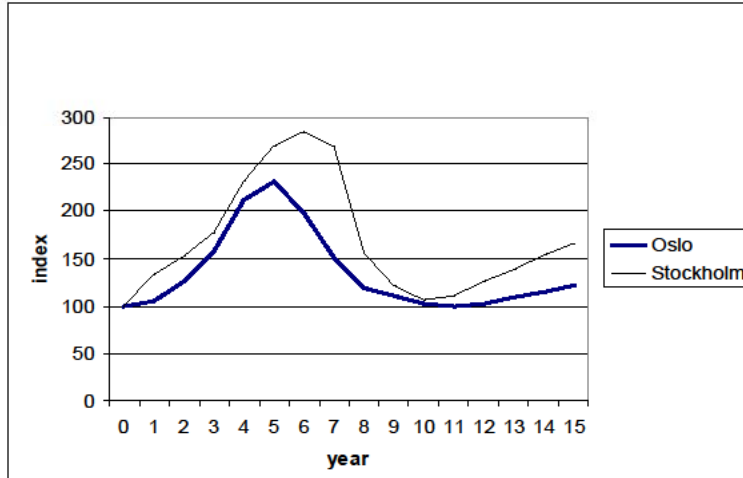
Figure 2: Annual percent household savings rate (in percent of disposable income) in Norway, Sweden and Finland, 1980-1995.



Eckbo

Bankruptcy Design (45)

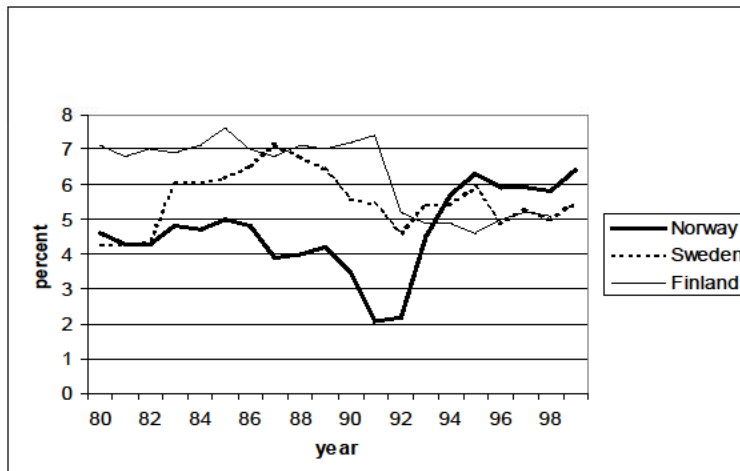
Figure 3: Annual commercial real estate price indices for Oslo (1981=100) and Stockholm (1983=100).



Eckbo


Bankruptcy Design (45)

Figure 4: Annual percent bank capital reserves (in percent of year-end total assets) for commercial banks in Norway, Sweden and Finland, 1980-1999



Eckbo

Bankruptcy Design (45)



## Two different bailout strategies

- Norway:
  - Placed the largest commercial bank in receivership (zeroed out old equity)
  - Infused taxpayer funds into the bank using a type of preferred equity capital
  - “Owner of last resort”
  
- Sweden:
  - Issued a system-wide debt guarantee
  - Purchased equity control in the third-largest bank
  - Spun off non-performing loans into a “bad bank”

Eckbo

Bankruptcy Design (45)

41



## Government as “owner of last resort”

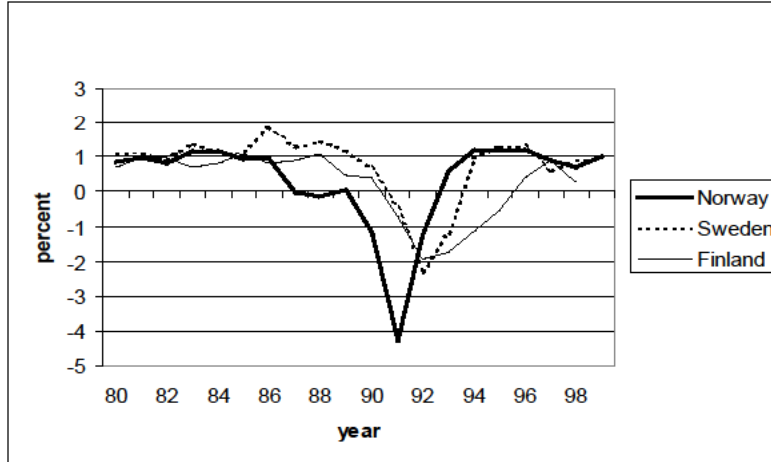
- Scandinavian experience with government bailout appears to be positive for taxpayers
  - IMF estimates overall bailout cost to be close to zero for taxpayers in both Norway and Sweden
  
- Norway made sure that existing equity was zeroed out BEFORE the taxpayer bailout
  - But subordinated debt got a windfall
  
- Sweden successful in its implementation of the “bad bank”
  - But here equity-holders also got a windfall

Eckbo

Bankruptcy Design (45)

42

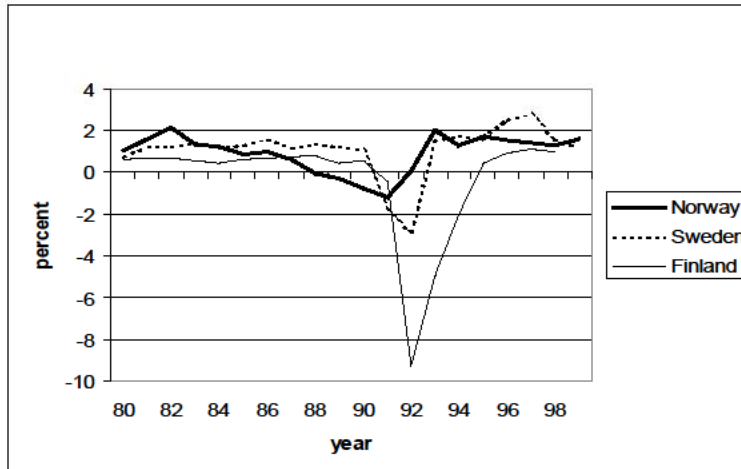
Figure 5a: Annual percent profits before tax (in percent of total assets) for commercial banks in Norway, Sweden and Finland, 1980-99



Eckbo


Bankruptcy Design (45)

Figure 5b: Annual percent profits before tax (in percent of total assets) for savings banks in Norway, Sweden and Finland, 1980-99



Eckbo

Bankruptcy Design (45)



## Conclusions

---

- Using the government to bail out systemically important financial institutions may be efficient
  - Need to clarify definition of “systemically important”
  - Bailout terms must be at least as demanding as if the funds came from the private sector (which refused)
    - Control rights
    - Upside participation
    - Superpriority
  - Government ownership must be temporary (covering the turnaround period only) and it must follow best governance practices (shareholder oriented)