

# Economics of Conflict, War, and Peace

Prof. Dr. Jurgen Brauer; Summer 2009  
Chulalongkorn University; Bangkok, Thailand

Session 4.2  
Capital: Major conventional weapons

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## Major conventional weapons: trade (1)

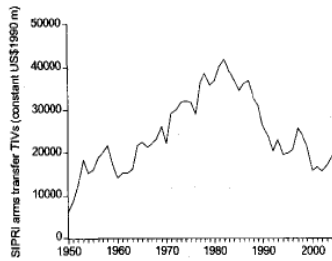


Figure 1. World arms transfer volume, 1950–2004, in constant 1990 US\$ million, SIPRI trend-indicator values. Source: SIPRI (unpublished data).

Brauer in Sander/Hartley, 2007, p. 978.

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## Major conventional weapons: trade (2)

Table 1  
World rank and volume of transfers in major conventional weapons, leading suppliers, 1950–2004, selected years (in constant 1990 US\$m, SIPRI trend-indicator values)

Country rank/supplier	Sum 2000–2004	1950	1960	1970	1980	1990	2000	2004	Sum 1950–2004	[1992–2004]
01/Russia	26,925	0	0	0	0	0	4,016	6,197	49,169	[1992–2004]
02/USA	25,930	1,446	5,074	7,138	8,588	7,901	6,400	5,453	465,085	
03/France	6,358	15	889	1,608	2,958	1,605	717	2,122	86,230	
04/FR Germany	4,878	0	135	1,096	1,249	1,468	1,105**	1,091**	47,640**	
05/UK	4,450	1,456	1,804	478	1,040	1,569	1,121	985	80,470	
† 06/Ukraine	2,118	0	0	0	0	0	326	452	5,216	[1992–2004]
* 08/China	1,436	0	282	609	828	848	187	128	38,739	
† 10/Israel	1,258	0	0	13	227	46	272	283	5,598	
† 13/Belarus	744	0	0	0	0	0	261	50	1,837	[1993–2004]
† 14/Uzbekistan	595	0	0	0	0	0	0	170	895	[2002–2004]
† 15/Spain	479	0	4	70	11	130	50	75	4,546	
† 19/South Korea	313	0	0	0	71	44	6	50	1,328	
† 21/Georgia	348	0	0	0	0	0	54	20	320	[1999–2004]
* 24/Brazil	131	0	2	0	158	65	0	100	2,878	
* 25/Indonesia	130	0	0	5	4	0	0	80	443	
* 27/South Africa	122	0	25	3	24	0	37	35	641	
* 28/Turkey	117	0	0	0	11	0	21	18	181	
* 29/North Korea	96	0	0	0	5	4	0	0	1,996	
† 30/Kyrgyzstan	92	0	0	0	0	0	0	0	616	[1995–2004]
† 33/Singapore	73	0	0	0	0	5	1	70	435	
* 34/Jordan	72	0	0	0	0	0	0	72	435	
* 37/Libya	50	0	0	0	65	36	0	0	919	
* 38/Lebanon	45	0	0	0	0	0	0	0	48	
* 39/India	44	0	0	0	0	2	46	22	498	
World total	84,479	6,358	14,006	22,069	36,744	26,053	15,838	19,156	1,341,671	

Brauer in Sander/Hartley, 2007, p. 979.

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## What is to be explained?

- Addition of states as arms producers/exporters (whole-units), esp. of non-high income states
- Drop-off of states as arms producers/exporters (whole-units), esp. of non-high income states
- Transnationalization of arms production, esp. of components
- Integration of non-high income and some high-income states into transnationalized arms production and component supply chain
- Integrate fall of post-Cold War demand and continuous unit-cost increase (Dunne/Surry: "structural disarmament") into the model

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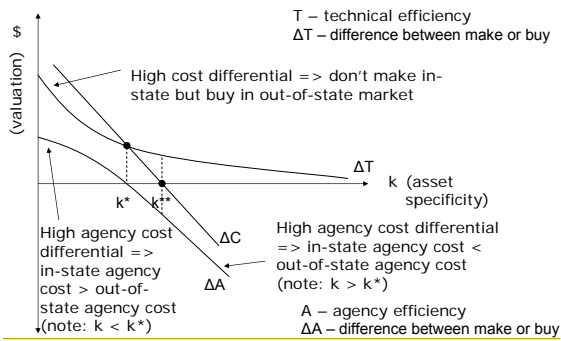
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## A heuristic model (1)




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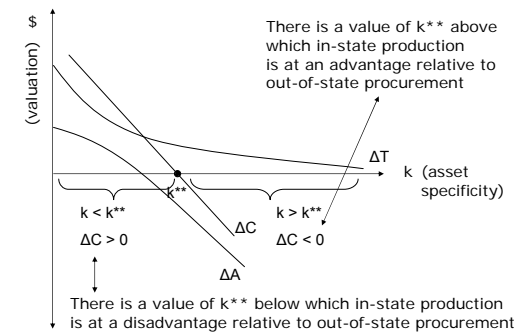
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## A heuristic model (2)




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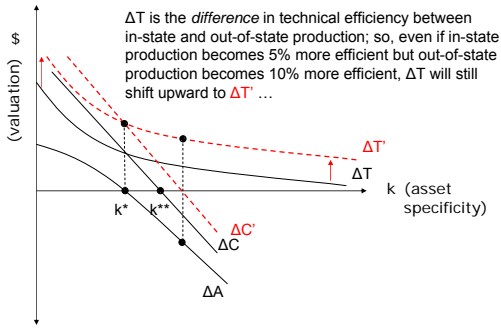
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### A heuristic model (3)




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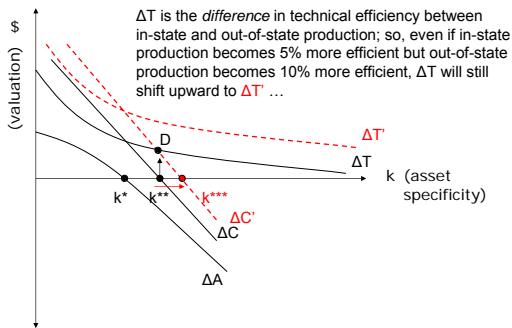
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### A heuristic model (4)




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### Playing with the model

- If  $\Delta T$  rises to  $\Delta T'$ ,  $k^{**}$  shifts right to  $k^{***}$ 
  - more contracting out
- If  $\Delta T$  falls,  $k^{**}$  shifts left
  - less contracting out
- If  $\Delta A$  rises,  $k^{**}$  shifts right
  - if the *difference* in agency cost rises
  - more contracting out
- If  $\Delta A$  falls,  $k^{**}$  shifts left
  - less contracting out
- If both  $\Delta T$  and  $\Delta A$  change, the move of  $k^{**}$  depends on the relative shifts (and directions) of  $\Delta T$  and  $\Delta A$

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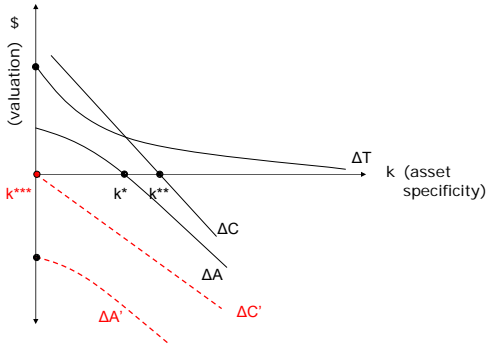
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## An extreme case




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## Some implications (1)

- Prior to the end of the Cold War ( $\Delta A$  constant),  $\Delta T$  shifted downward as states "developed" and  $k^{**}$  shifted leftward, resulting in more in-state arms production
- Thus, high-income states producing/exporting whole-units went from  $n=20$  to  $n=30$  and non-high income states from  $n=9$  to  $n=37$
- With the end of the Cold War, agency costs of contracting-out have fallen ( $\Delta A$  shifts upward) and the cost of technical inefficiency ( $\Delta T$  constant) has become more apparent, leading some states to drop out of whole-unit production ( $k^{**}$  shifts rightward)
- Also, post-Cold War demand drop-off leads to smaller production runs (higher  $T$  and, probably, higher  $\Delta T$ 's)

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## Some implications (2)

- In addition, technical requirements push  $T$  upward and, probably, the  $\Delta T$ 's, disadvantaging some states
- This might explain why post-Cold War we seem to see some states dropping out of whole-unit production and more states engaged in transnationalized component production
- There is capacity for efficient component production but not whole-unit production and there is willingness ( $\Delta A$ ) to transfer component technology but not whole-unit technology (battles over offsets-technologies)
- The model also suggest that states that refuse to integrate into the transnationalized component supply-chain and that insist on whole-unit production might find themselves carrying unusually high defense production/procurement burdens

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## Conclusion

- Heuristically, the model makes some sense (to me at least)
- It suggests that for the industry as a whole, agency efficiency, technical efficiency, and asset specificity drive decisionmaking behavior
- The challenge now is to work up some real-world case studies and to apply/refine the model; convert from post-hoc to make predictions

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