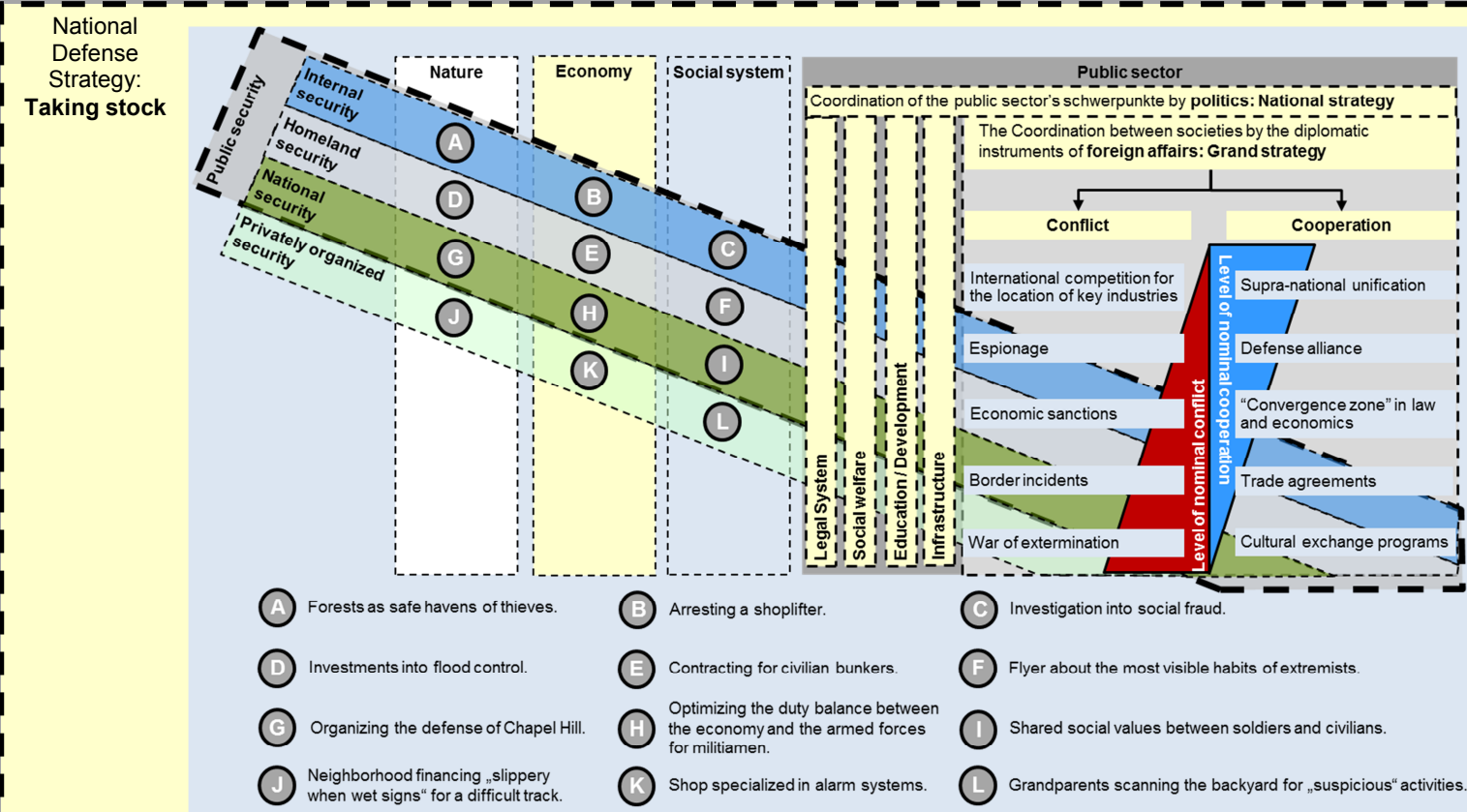


The Military System of Democracies XV: The National Defense Strategy – Overview

The point I am trying to bring out is that one does not plan and then try to make circumstances fit those plans. One tries to make plans fit the circumstances. Patton (1947 / 1995, p. 116)

For by making battle appear the only 'real warlike activity', his [Clausewitz – PTB] gospel deprived strategy of its laurels, and reduced the art of war to the mechanics of mass-slaughter. Moreover, it incited generals to seek battle at the first opportunity, instead of creating an advantageous opportunity. Liddell Hart (1954 / 1991, p. 342)

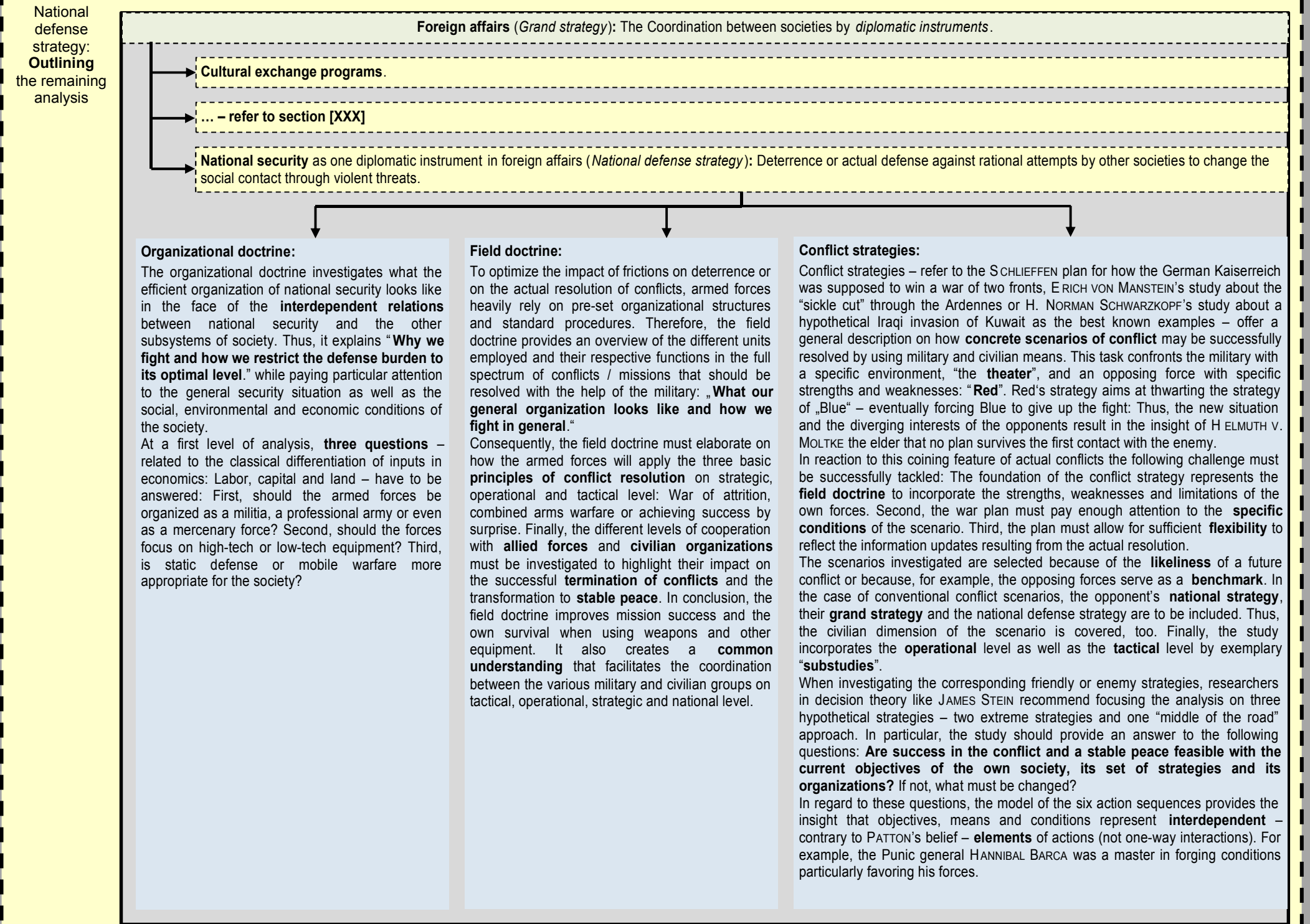


(1) In regard to the security dimension of societies, the illustration to the left provides an **overview** of the results achieved so far. First, it highlights the four main **subsystems of societies** – the public sector, the social system, the economy and nature. It then focusses on the public sector with its **schwerpunkte** coordinated by **politics**. Because **rational threats** based on violence can generate significant pay-offs, the social contract identifies security as one of these **schwerpunkte**. To counter the spectrum of rational threats in a society, three **“divisions” of public security** can be identified: a) **internal security** focusing on criminal threats, b) **homeland security** fighting terrorists, and c) **national security** to overcome threats stemming from other societies. The corresponding organizational structures are principally driven by the costs and benefits of **centralized** and **decentralized** solutions. In addition, the public sector will often only provide a **basic supply** of security due to the constitutional principle of “equal rights”. Thus, additional security must be provided by **private organizations** for activities exposed to greater security risks than average citizens – for example, jewelry shops.

(2) The illustration also elaborates the main insight of PARSONS – **subsystems** exist because they specialize in critical **output** to the other systems of society: The twelve examples highlight the **interdependent relationships** between the four subsystems of security and the three subsystems of society – nature, the economy and the social system.

(3) The final shift in the focus of the analysis represents its concentration on the subsystem of **national security** (The “military system”). Because national security focusses on threats that have their origins in other societies, it represents one of the **diplomatic instruments** in foreign affairs. The illustration highlights the fact that national security as part of the grand strategy of society is not only relevant to the resolution of conflicts, but cooperation in military affairs may also serve as an instrument to deepen the relationship to another society.

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A **national defense strategy** must encompass three “chapters”: a) The organizational doctrine to reflect the various relations of the military system to the other system of its society, b) The field doctrine to offer a general outline of the military system’s functions and c) conflict strategies to resolve a specific conflict. The analysis will now investigate each of these chapters in more detail.

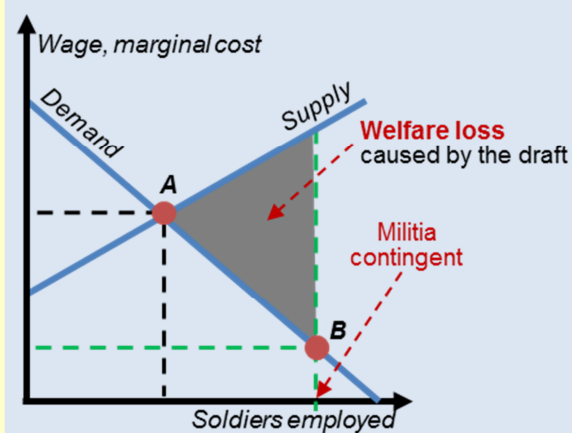
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The Military System of Democracies XVI: Central Issues in Organizational Doctrine

Every gun that is made, every warship launched, every rocket fired signifies, in the final sense, a theft from those who hunger and are not fed, those who are cold and are not clothed. This world in arms is not spending money alone.

Dwight D. Eisenhower (1953)

Organizational Doctrine I: Militia, Professionals or even Mercenaries?



(1) The illustration above presents a **neo-classical** reasoning why a militia should be considered **inefficient**. The model is again based on the vital tool of economic analysis, the **market cross** – refer to section [XXX]: The cross depicts the **demand function** representing the respective maximum wage the armed forces are willing to each additional soldier employed. The function slopes **downward** because each additional soldier is only able to generate a lower contribution to national security – i.e., there exists a point of saturation. In contrast, the **supply function** slopes **upward**, because each additional soldier recruited faces better employment opportunities in the civilian sector (marginal cost of recruitment).

(2) A professional army **competes** with the civilian sector under **voluntary** terms. This results in an **efficient** wage-quantity combination (= **A**) – the military will only hire soldiers as long as their contribution covers the costs. In contrast, the militia must draft a **given** number of soldiers to do justice to the "All must serve"-principle. This leads to an inefficient combination (= **B**): The militia is hampered by an over-sized workforce, underpaid and therefore unmotivated. In turn, the militia can only be equipped with **insufficient** quantities of military **hardware** – implying **disproportionate losses** in conflicts.

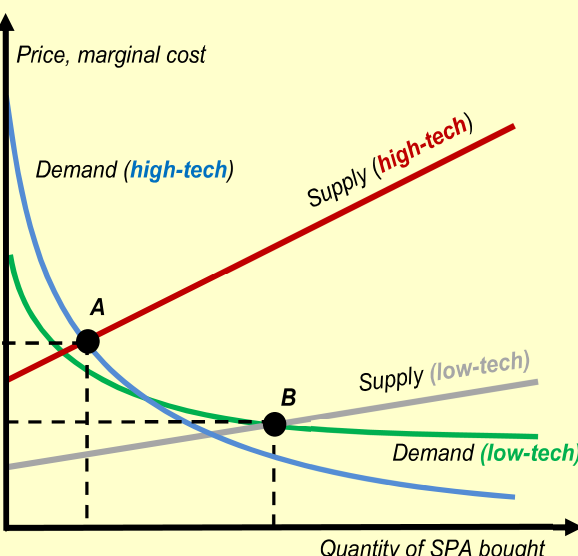
(3) Modern economics of defense revive aspects already discussed by ADAM SMITH – refer to the illustration on the right: As pointed out on schema XXX, **no** organizational design is dominating **per se**. This insight also applies in this context: Variables like a) the **probability** of an attack, b) the kind of **threats**, c) the **civilian opportunity costs**, d) the **training requirements** and e) the **spillovers** between civilian and military qualifications influence a society's decision for a specific army design. For example, professional armies face difficulties to replace its losses in a **total war scenario**.

Probability for a crisis		Reduction of the number of refresher courses	
high	Constabulary	Professional army	Militia (increasing the pool by lowering health qualifications, age restrictions)
medium	Constabulary	Professional army	Militia (increasing the pool by lowering health qualifications, age restrictions)
low	Voluntary militia	Militia (focusing on the draft of young persons with low opportunity costs)	Militia (increasing the pool by lowering health qualifications, age restrictions)
		low	high
		Threat level	

(4) In addition, when most citizens are to be recruited anyway, a recruiting based on voluntary wage negotiations only "complicates things". A militia may survive times of low or medium conflict probability by **reducing** the number of "refresher" courses. This avoids the significant costs of **reorganization** the change to a professional army would call for. Finally, MACHIAVELLI already stressed the **incentive problem** with mercenaries: A militiaman has the incentive to end the war as soon as possible because of his civilian **opportunity costs** – a trait often exploited in history by professional armies seeking to undermine the militia's morale by drawing them into prolonged campaigns. In contrast, a mercenary is motivated to fight a "bloodless, but endless war", may become **unreliable** without payment ("No gold, no Swiss pikes!") or even turn against his former employers: "Stop quoting laws, we carry weapons!"

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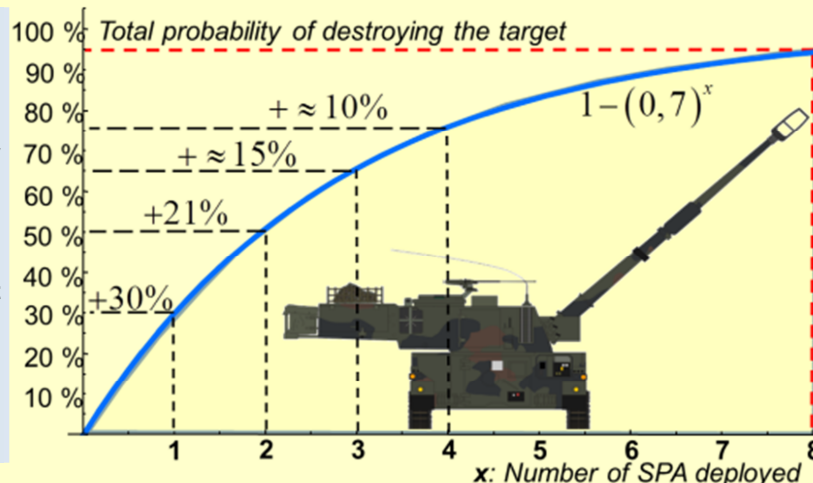
Organizational Doctrine II: Procuring military hardware – high-tech or low-tech?



(2) When n SPAs take the target under fire, the super cannon survives with a probability of $(1-p_i)^n$. In all other cases, **at least** one SPA scores a "kill". Consequently, n SPAs destroy the target with a probability of $1-(1-p_i)^n$. The graphic to the right provides an example of this formula for a high-tech SPA with $p_i=0.7$. The "kill probability" function exhibits the economic **law of diminishing returns**: Each additional SPA **increases** the probability of a kill, but its contribution is lower than the previous SPA's contribution. The law applies because the probability of multiple hits – still resulting in only one "kill" – increases **disproportionately** with the number of SPAs deployed.

(4) The relationship between the two **demand functions** is characterized by a **single-crossing property**: Because the contribution of the first high-tech SPA to mission success is greater than the contribution of the first low-tech SPA, so is the willingness to pay – compare the difference in the respective intersection with the y-axis. However, as less high-tech SPAs are needed to accomplish the mission, the demand function of the high-tech SPAs features a greater slope resulting in the crossing of the two functions.

(1) The graphic above represents the market equilibria for the procurement of low-tech and high-tech military hardware. The equilibria are derived for a neo-classical setting based on the **simplest** model of combat: A **single** enemy target, e. g., the "super cannon" of a dictator, threatens to inflict a damage of CHF 1 billion. The democracy tries to eliminate the threat by deploying a **specific** number of self-propelled artillery (SPA). This can be done **without** enemy return fire. Each SPA is able to destroy the target with a **probability** $0 < p_i < 1$. It is assumed that **two types** of SPA are offered for this mission differing in their hit probability: High-tech SPA and low-tech SPA.



(3) Assuming the SPAs serve **no** other purpose and possess **no salvage value**, the **maximum procurement price** for each SPA is calculated as follows: First, the number of SPAs is determined destroying the target with an approximate probability of "1". These weapons prevent a damage of 1 billion CHF. Thus, the (**risk-neutral**) procurement agency is willing to pay this amount as the maximum price for this quantity of SPAs – refer to the **green** area under the total probability curve. This amount can be divided up between the single SPAs in accordance with their respective contribution: For example, acquiring (and deploying) a first SPA with $p_i = 0.7$ avoids the **expected** damage of 0.3×1 billion = CHF 300 Mio. This value determines – together with the values of the other SPAs required to destroy the target with near certainty – the shape of the demand function. This is illustrated by the blue area under the demand function for high-tech SPAs in the graphic to the left.

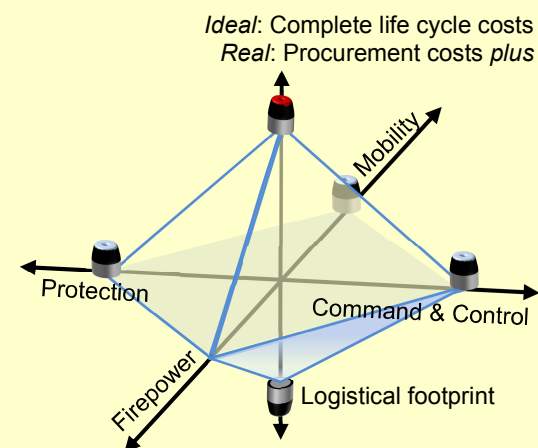
(5) The shape and the position of the two **supply functions** is based on the following thesis: It is safe to assume that research and development costs of high-tech SPAs are higher than those of low-tech SPAs. The graphic to the left assumes the same relationship for the marginal costs. However, the picture may be different in reality – in particular, when the analysis is extended to reflect life-cycle cost: While the **training** on high-tech SPAs may often be more expensive, the **maintenance costs** can be lower – especially, after the **teething problems** have been ironed out. In addition, the personal and social costs of losses are higher for low-tech SPAs. In the constellation analyzed, the efficient solution lies in procuring high-tech SPAs because of lower expenditures (price \times quantity) – refer to the size of the squares with A or B as respective corners. However, this basic model implicitly assumes that both equilibria are derived under the same **competition** standards: Competitive markets. In reality, high-tech SPAs will be regularly procured from a **monopolist** capable to extract **super profits** based on his information advantage.

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Organizational Doctrine III: Mobile or static warfare?

(1) The **performance potential (PP)** of military organizations on the strategic, operational and tactical level can be measured along six dimensions: a) **Firepower** (capability to inflict losses on the enemy reducing his will to continue the fight, b) **Protection** (capability to survive enemy fire) c) **Command & Control** (C²: designing and coordinating a military action despite encountering friction – i.e., enemy forces, environment and the limits to the own forces set by mind and body) d) **Logistical footprint** (the effort required to minimize the strain, keep up or increase the PP of units) e) **Mobility** (capability and speed of changing a position in space to improve the effect of a military action) f) society's **opportunity costs** to create, maintain, deploy and dissolve the unit. The impact of the different parameters' on the PP can be expressed in monetary terms. The next schema provides a corresponding sketch.

(2) Here the focus lies instead on the major **trade-off** between mobility and the other four non-monetary dimensions. Already Clausewitz stressed the advantages of defense over attack: While mobility is sacrificed, all other parameters can improve. The predisposed positions of a defense parameter facilitate supply and C². Establishing "kill zones" also increases the impact of firepower. Protection benefits from camouflage and the use of bunkers, shelters etc. Static defense even contains the **moral** signal of a non-aggressive society. The **drawback**: The enemy obtains the initiative when and how to strike. However, when the attacker's route of approach can be **perfectly** anticipated, his only hope rests in tiring the defense by raising false alarms or in a attrition campaign similar to the siege of medieval castles. Often the **scarcity** of resources and the option to create **new** routes of approach result in the downfall of static warfare (France 1940). Thus, defense planners should heed the advice of Frederik II.: "He who attempts to defend too much defends nothing."



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The Military System of Democracies XXX: Principles of Combat as part of the Field Doctrine

That general is wise who before entering into war carefully studies the enemy, and can guard against his strong points and take advantage of his weaknesses. For example, the enemy is superior in cavalry, he should destroy his forage. He is superior in number of troops, cut off their supplies. His army is composed of diverse peoples; corrupt them with gifts, favors, promises. There is dissension among them; deal with their leaders. This people relies on the spear; lead them into difficult terrain. This people relies on the bow; line up in the open and force them into close, hand-to-hand fighting.

Emperor Maurice (6th century / 1984, pp. 64)

Once the enemy has taken flight they can be chased with no better weapons than air-filled bladders.

Maurice de Saxe (1732 / 2007, p. 122)

The Three Basic Principles of Warfare to Force the Own Will on the Enemy

"War therefore is an act of violence to compel our opponent to fulfill our will." – Carl v. Clausewitz (www.clausewitz.com)

War of Attrition:

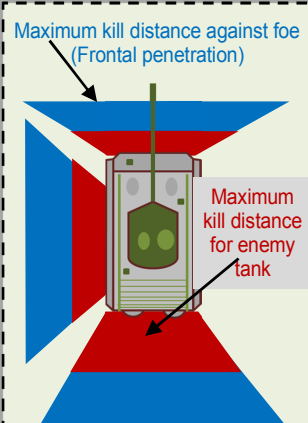
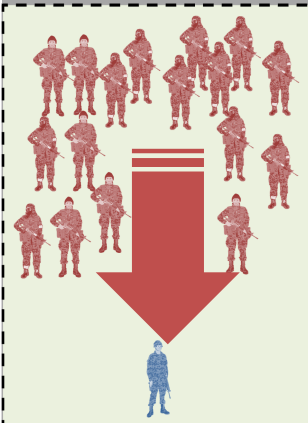
The opposing combat capabilities are exhausted either by putting them under constant tests (by repeated waves of attacks) or by cutting their supply lines.

Attrition by numbers:

Combat always results in fatigue, strain, depletion of supplies and losses. If the defender's logistics is not able to compensate for these reductions in his capabilities, his forces must eventually cease their resistance.

Attrition by quality:

If forces meet that are similar in size, the opposing force can be worn down because the own units enjoy a superiority in training or because the weapons employed offer a superior kill loss probability.



Pros:

- Requires very low training and leadership standards.
- Thus, a favorite choice for "Ad-hoc-forces".
- Often the only way to "plug the hole into the wall" that achieves the breakthrough against a well-entrenched opponent.

Pros:

- Can ensure local battlefield superiority at reduced losses.
- Creates a moral boost to the troops because of their status as "elite forces".

Cons:

- Very costly against forces enjoying a significant technological edge.
- Supply requirements to keep up the amassed forces participating in the onslaught.

Cons:

- Requires significant investments in education and a strong domestic armament industry capable to assume technological leadership in specific aspects.
- The quality edge represents often only a temporary advantage: The enemy will reverse engineer captured equipment and attempt to "leap frog" on a superior technology level.
- In a total war scenario it is difficult to keep up the quality level of pre-war training.
- The elite status may result in overconfidence and lure troops into fool-hardy attacks.

Historical blunders:

- Alesia 52 BC.
- Agincourt 1415.
- Omdurman 1898.

Historical blunders:

- Little Bighorn 1876.
- Dien Bien Phu 1954.

Historical successes:

- Grant's destruction of Lee's Confederate Veterans in 1864.
- Adwa 1896.
- El Alamein 1942.

Historical successes:

- Cunaxa 401 BC.
- The superior firing cadence of Prussian infantry or British warships during the 18th century.
- The 10:1 kill loss ratio of Tiger units in 1943.

Superiority in Combined Arms Warfare:

"Combined arms is the full integration of arms in such a way that in order to counteract one, the enemy must make himself more vulnerable to another. We pose the enemy not just with a problem, but with a dilemma – a no-win situation."

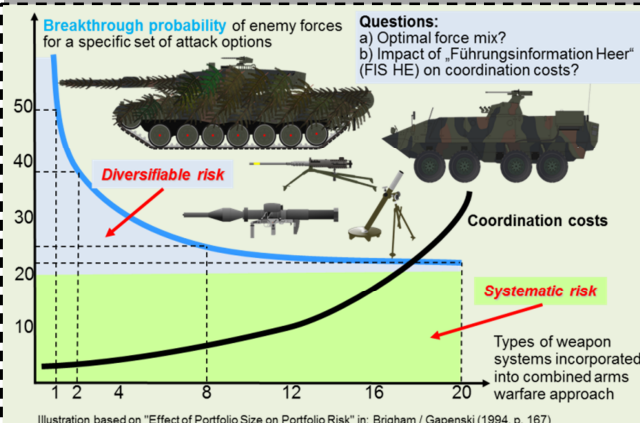
Alfred M. Gray (1989 / 1994, pp. 97)

Red's tactical disposition

Red's armor-focused approach



Red's infantry-focused approach



Pros:

- A best response will often result – in particular, in comparison to attrition – in low casualties.
- Combined arms warfare requires a mix of correctly anticipating enemy actions and a well-timed coordination between the participating subunits. These conditions are difficult to master as many armies have experienced since World War I. Consequently, these difficulties offer a sort of protection against quick imitation by the enemy.
- Each addition of weapon systems specialized in fighting specific approaches reduces the risk of an enemy breakthrough. However, a non-diversifiable risk remains – for example, because of the superior quality of enemy troops. In addition, the coordination costs increase with a rising heterogeneity of the combat unit.

Cons:

- Combined arms warfare calls for extensive training and a corresponding infrastructure.
- Again, similar to attrition by quality, the training in combined arms warfare often represents a bottleneck during war times.
- The force structure must be build on a precise understanding of the enemy options or offer the flexibility to set up "ad hoc units" (Kampfgruppe or battle group).
- Consequently, combined arms warfare implies a significant logistical footprint.

Historical blunders:

- Grandson 1476.
- Ney's cavalry charge on the Allied center at Waterloo 1815.
- Jeb Stuart's "ride for glory" and Pickett's Charge at Gettysburg 1863.

Historical successes:

- Cannae 216 BC.
- Blitzkrieg campaigns 1939 to 1941.
- The Second Gulf War 1991.

Taking the Enemy by Surprise:

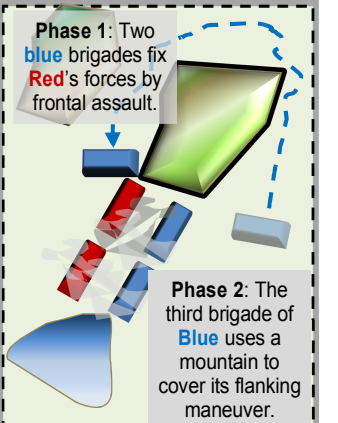
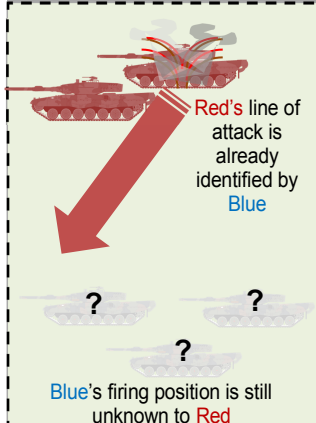
The defending force has failed to anticipate the attack in regard to its time, its place, the method of approach or the attack technology employed. Consequently, the force is eliminated or forced to surrender without significant resistance.

Surprise by superior knowledge:

"So it is said that if you know others and know yourself, you will not be imperiled in a hundred battles ..." – SUN TZU (4th to 3rd century BC / 1988, p. 53). Superior knowledge can basically come from three sources: The enemy plans are revealed by espionage, battlefield reconnaissance or through carelessness. Or the leadership is able to "perfectly" anticipate the moves by the enemy.

Surprise by battlefield innovation:

Technological advances in the approach to the battlefield, the tactical troop movement – resulting in enfilading fire – or the technology of weapons employed may cause a shock to the expectations of the enemy – their anticipated combat actions (their plans, their force disposition, training or equipment) had been based on a different understanding of fighting.



Pros:

- Knowledge about the enemy dispositions allows to target the enemy at his most vulnerable moment – in turn, the victims may suffer maximum losses.
- When successful, the own losses can be minimized in this constellation, too.

Pros:

- The impact of the new system on combat results can be tested before the actual mission starts.
- Because the implementation phase normally starts at a later stage than planning / decision, it is often possible to make last-minute adjustments.

Cons:

- There is always the concern that the information gathered is based on exaggerations, intentionally leaked or the force disposition identified is actually arranged to spring a trap.
- The delay between setting up a plan based on the information advantage and the implementation – refer again to section [XXX] – may result in a changed situation.
- The effort to conceal the source of superior knowledge can imply the unintentional signal at the opponents that their plans have been spoiled.

Cons:

- Once employed in missions, the combat value of technological innovations will often drop sharply because the enemy starts to develop counter-measures.
- Breakthrough technologies often feature "teething problems" that must be ironed out to realize the full potential.
- Incorporating new technologies into training, logistics, tactics and operations requires gatekeepers responsible for an encompassing view – otherwise the introduction may be hampered by delays or insufficient resources.

Historical blunder:

McClellan and the accidental discovery of Lee's plan for the Antietam campaign.

Historical blunder:

The uncoordinated "Wunderwaffen" programs of the Third Reich that mushroomed during the final stages of World War II.

Historical successes:

- The initial stages of the Hittite attack on the Egyptian forces in the battle of Kadesh 1274 BC.
- Trebbia 218 BC.
- "Ultra" and the campaign in North Africa 1941-1943.

Historical successes:

- The "Greek fire" employed by the Byzantine Empire.
- The Venetian galleasses in the battle of Lepanto 1571.
- The turtle ship – the Korean variant of the Galleass?
- The conquest of Eben Emael by gliders in 1940.