

The Military System of Democracies I: Man without Society

A leader without either interest in or knowledge of the history and theory of warfare – the intellectual concept of his profession – is a leader in appearance only. ... after all, an officer's principal weapon is his mind. ALFRED M. GRAY (1989 / 1995, p. 67)

One of Machiavelli's assumptions, although it is never clearly articulated, is that an army tends to reflect the quality of the civil society of which it is a part. NEAL WOOD (1965, p. LXXII)

The Fundamental Restriction and Its Impact on Human Existence

The fundamental restriction of human life

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(1) The human **mind** with its mental capacities like **rational thinking** – developing a consistent life concept and acting accordingly – and **communication** evolved during the **evolution** of man because it improved the chance of survival.

(2) Neuroscientists like DANIEL WOLPERT^[1] suggest brains originally developed to coordinate **movement**. Movement implies connecting a spatial status quo and a desired position by a corresponding action. As the evolution of man progressed, their brain capabilities extended to fulfil related functions. In particular, the mind **facilitates** two main types of actions, **cooperation** and **conflict** (refer below), by offering the possibility to the player to “imagine himself” in the “shoes”^[2] of others – partners and opponents alike.

(3) However, human minds are irrevocably **tyed** to a biological **body**^[3]. This represents the fundamental restriction of human existence.

Implications of the fundamental restriction: **Bounded rationality, self-interest, scarcity** and others

2

(1) The importance of the fundamental restriction can be underlined by its major **implications** for all human actions. “**Vita brevis est**” and each life features three phases: A period to **grow up** (focusing on learning), a period of **maturity** in which skills are in their **prime** and a period of **decay** – ending in death.

(2) To offer the best chance of survival and reproduction, each biological body possesses a genetic **code** facilitating the choice of actions – particularly in a case of emergency. The driving force behind this behavior code can be called “**self-interest**”^[4].

(3) Body and mind are continuously exposed to evolution. Consequently, men **differ** in skin **colors**, **body shapes**, **habits** etc. These differences offer **advantages** or **disadvantages** in specific environments.

(4) Perceptions of oneself, others, the environment and actions must remain **subjective**. The memory of the past is incomplete, too. Thus, there is **no objective truth** feasible, only a “**fuzzy consensus**”^[5].

(5) The human body needs periods of **regeneration**. In addition, the body functions consume a specific amount of energy. Most of it is covered by **nutrition**.

(6) To realize goals, persons or resources often have to change their location. In general, the range of these movements is limited to Earth resulting in a **scarcity** of **resources** available. In addition, it very often takes time, effort and other resources to transform resources to the state required by the respective action. This combination is called **production**.

Basic reactions to the fundamental restriction: **Life concepts** and **coordination** in cooperation and conflict

3

(1) The fundamental restriction and its implications force two major reactions. First, the inevitability of death and the uncertainty about afterlife – “from which no one has returned”^[6] as already emphasized by the ancient Egyptians – urge man to develop rational life concepts. Second, humans must engage in two basic types of interaction: Cooperation and conflict.

(2) Earth is offering a vast number of different environmental settings. In addition, the number of human beings available as potential partners for interactions is also huge – in particular, in modern times. Thus, a myriad of actions is available to each individual each day. Rational **life concepts**^[7] imply to focus on those activities that offer a unique and rewarding experience by developing a person's physical and mental potential in accordance with their individual preferences – in short, a consistent plan of actions for the full life span that will most likely result in minimum regret.

(3) To support humans in their pursuit for successful and sustainable life concepts, the various **sciences** have evolved over the course of history: In general, science analyzes the challenges to human existence and develops means to diminish their impact. E.g., **philosophy** is looking for principles to live a life that not only offers minimum regret, but that is also morally justified. In **physics** solutions are developed how the environmental forces can be used to the best advantage and how natural disasters may be avoided – or, at least, their impact on human existence can be optimized.

(4) The restriction and its implications also force humans to engage in two basic types of relationships: **Cooperation** and **conflict**. E.g., acquiring and training social skills requires the **support** of the family in childhood. In contrast, **scarcity** always implies a conflict because the different options to use a resource **exclude** each other.

(5) **Cooperation**: The parties involved share some common interest, but a coordination effort is still needed because of missing information, differences in preferences or diverging incentives to participate due to differing cost structures.

(6) **Conflict**: The parties perceive themselves as opponents because every option available to solve the issue **seems** to imply that **only** one side receives benefits (the **winner**) while the other party is forced to accept a reduction in its welfare (the **loser**).

(7) In reality, the **borders** between conflict and cooperation are **blurred**: As an example of conflicts featuring elements of cooperation, consider the case of soldiers preferring to fight in a war where the rules for the treatment of captives are respected. Analogously, a cooperation offering mutual benefits may not be realized because the incentive to shirk is too strong and no counter design can be enforced.

The Point of Reference for Societies: The Original Position

The spectrum of „original positions“

4

(1) To highlight the impact of the fundamental restriction on the design of human actions (in particular, the design of societies), philosophers like JOHN B. RAWLS introduce the concept of the **original position**^[8]: A hypothetical situation stripped off all institutions or organizations facilitating the life of man.

(2) There exist several **versions** of the original position. These differences are caused by the weight the respective analyst attributes to conflict and cooperation – based on their assumptions about the “essence of man”. On the one extreme, there is **Hobbesian anarchy**, denude of any cooperative element and causing the untamed self-interest to make “life of man, solitary, poore, nasty, brutish and short.”^[9] The other extreme is “**paradise lost**”^[10] – as described, e.g., in the Old Testament: Death, imperfections in mind and body or scarcity are non-existent. Instead the individuals are able to enjoy cooperative relations exclusively based on love / charity.

Approximating the original position: Cooperation and conflict in “pure” evolution-driven scenarios

5

(1) Which setting is more appropriate as the original position? Like any competing approach in politics or social sciences that survives “the test of time” (the respective concept is still attractive to a significant number of persons even after being tested in daily routine), each of the two scenarios can at least claim to possess an **element of truth**.

(2) The **evidence** for **Hobbesian anarchy** is backed by referring to the behavior of man's biological relatives: Gangs of chimpanzees are known to ambush and kill outsiders for their meat.^[11] In addition, there exist prehistoric incidents like the massacre of Talheim^[12] that happened around 5'000 BC in the southwest of modern Germany. While some archeologists point out that the findings at Talheim, Ofnet or other places have been misinterpreted and the massacres actually represent “burial rites”^[13], **violence** still represents an **inherent part of human existence**.

(3) “Everywhere we probe into the history of our species we find evidence of a similar pattern of behavior: People have always been capable of both kindness and extreme cruelty. The search for an earlier, less-violent way to organize our social affairs has been fruitless. All the evidence suggests that peaceful periods have always been punctuated by episodes of warfare and violence.”^[14]

(4) The investigation into the evidence for **cooperation** as a vital factor in the original position is inspired by BRIAN SKYRMS' analysis on the **human sex ratio**:^[15] At the date of birth, an excess of male newborns over female babies exists. As adulthood approaches, this excess withers away due to the higher mortality rate risk-loving males experience during youth. Thus, the relationship turns to **parity** between **males** and **females** as they enter the stage of sexual maturity. At later life stages the balance shifts again – but then in favor of female excess.

(5) In accordance with the evolution theory by CHARLES DARWIN, such ratio patterns are to be interpreted as contributions to optimize reproduction conditions.^[16] E.g., perhaps the excess of females in the elderly population occurs, because the skills of males are later deteriorating in regard to their primary functions like hunting or protection and one parent is enough to support their offspring when the latter rear their own children. The following sections seek to illustrate how an economic perspective on such design features of reproduction like the sex ratio explain the significance of cooperation in the original position. In particular, the analysis is able to highlight the link between the evolution as a force and the most basic social construct to support cooperation becomes visible: The **family**. However, to achieve this objective, a general approach to investigate the design of actions in cooperation and conflict is required. Because this “**general formula**” of human actions will later be “fleshed out” to characterize the **military** as a **subsystem** of (democratic) **societies** – refer to section [XXX], the next two sections will offer an overview of this approach. In turn, the illustration of cooperation as a part of the original position by investigating important design features of reproduction is postponed to [XXX].

Elements of rational actions

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(1) The general formula is based on the following insights: The **fundamental restriction**, the indissoluble union of mind and body, exposes man to the forces of the evolution and limits man's capabilities and rationality: In particular, man is only able to **perceive** the **world of man** as pointed out by IMMANUEL KANT.^[17] Thus, CONFUCIUS sees the first condition for successful actions in an (approximate) clear-cut **system** of **definitions** to grasp the forces determining the outcomes.^[18]

(2) According to TALCOTT PARSONS, the **structure** of the human world can be identified by applying the perspective of **system analysis**:^[19] What **functions** may a specific phenomenon fulfill in the various life concepts of individuals who are – due to the evolution – significantly or even mainly motivated by **self-interest**? The first major result of this perspective lies in the identification of the general configuration of rational actions as a **sequence of six steps** – refer to PETER BALTES, Sr.^[20]

2

(3) Section [XXX] provides a detailed analysis of the action sequence. Here it suffices to point out that its six steps can be labeled with a) **objectives** – b) **analysis** – c) **planning / decision** – d) **preparation** – e) **implementation** – f) **evaluation**. Furthermore, the cornerstones deciding about the success potential of a specific action are represented by three “intermediate outputs” in the action sequence: In the mental dimension these are the action's **objectives** and its **strategy** (the plan to coordinate the single moves chosen to change the status quo into the preferred state). In the real dimension it is the action's **organization**, i.e., the (optimal) arrangement of inputs required to implement the action. The compatibility of a specific action with the corresponding player's life concept can be assessed by checking the action's potential contribution to the four **basic categories of objectives** in life that each life form has to pursue in reaction to the fundamental restriction – compare to A BRAHAM H. MASLOW's similar “hierarchy of needs”^[21]: a) **Life sustenance** to keep mind and body operational, b) **protection** against threats stemming from the animate and inanimate environment, c) **development** of life concept and skills (this third category also includes recreation) and d) **reproduction**. The next schema will continue by exploring strategies and organizations from an economic point of view.

The General Formula of Action Design

The Military System of Democracies II: Scarcity and Its Impact on Action Design

... as Goethe expressed it, "in order to spend on one side, nature is forced to economise on the other side." ... I suspect, also, that some of the cases of compensation which have been advanced, and likewise some other facts, may be merged under a more general principle, namely, that natural selection is continually trying to economise in every part of the organization. If under changed conditions of life a structure, before useful, becomes less useful, its diminution will be favoured, for it will profit the individual not to have its nutriment wasted in building up a useless structure.

CHARLES DARWIN (1859/1959, p. 295)

The General Formula of Action Design (continued)

The spectrum of player relationships and the three basic trade-offs

(1) In the world of man, the **effect of nothing is nothing**. Hence, strategies and organizations seeking to change the status quo in accordance with the objectives must focus on the **resources** required to achieve this goal: The **human players** as active participants or affected stakeholders, **material inputs** (like land or machines) and **immaterial inputs** (like knowledge and reputation).

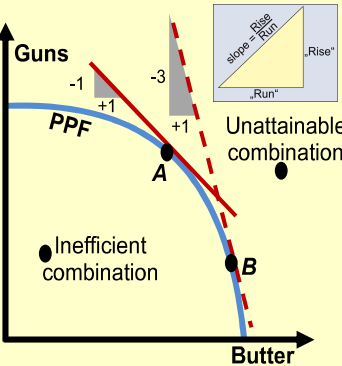
(2) As stated in the previous sections, the fundamental restriction forces all human actions to feature elements of cooperation and conflict. Thus, depending on how the respective perspectives of the players – the “I”, the “us” and the “them” (the significance of this differentiation will become clearer in [XXX]) – are weighted in specific strategies or bundles of strategy, four basic types of **relationships** between human players can be distinguished: a) **symbiosis** (a weak form of cooperation), b) **teamwork** (explicit cooperation), c) **competition** (conflicts restricted by rules to peaceful resolution) and d) **breaches** of the social contract, based on fraud and violence – the concept of the social contract will be explained in section [XXX].

(3) In regard to the resources employed, any strategy must come up with answers to the following questions (the latter determine the main elements of MICHAEL E. PORTER's so-called **value chain**^[22]): a) Should this particular resource be acquired? b) If yes, should it be used now or modified / improved or stored? c) Should it be kept in possession, recycled, dumped or sold?

(4) **Scarcity** of resources confronts the design of actions with **three** principal **trade-offs**: a) The **ends-trade-off** forces the development of consistent priorities in regard to objectives. b) The **independence-specialization-trade-off** dominates strategy formulation because coordination designs do not hold the rank of final reasons. E.g., there is the common saying that “countries have no friends in realpolitik, they enter only alliances because they (temporally) share interests with other nations.” Thus, Swiss neutrality is to be perceived as an instrument to achieve the country's objectives. It is not to be confused with one of the society's objectives. c) The **flexibility-concentration-trade-off** stresses the importance of entropy to organizational design: E.g., even when the basic strategy is known, the “kairos” to concentrate the required resources determines the impact of the corresponding action. Each of these three trade-offs is now investigated in greater detail.

7

Trade-off I: Ends-trade-off



(1) The first **trade-off** stresses the fact that scarcity implies **unbounded ends meet limited means**. For example, the modernization of the Swiss air force automatically calls for reductions in other military or civilian (public or private) programs. This insight is usually illustrated in textbook economics with the concept of the **production-possibility frontier** – refer to the graphic on the left: Even in a scenario without retooling costs or information issues, the output in the economy is limited by its current endowment of inputs like labor, capital goods or land and its set of production technologies available. The example focusses on the case of the economy producing only two outputs – guns and butter.

(2) Then the fixed amount of inputs implies that certain combinations of output are **not feasible**. Other combinations, while attainable, are characterized by **inefficiency**: In this case the inputs available could either produce a greater amount of both goods – or they could increase the output of only one good while the output of the other good remains constant. The **production-possibility-frontier** (PPF) represents **all** efficient **combinations** of goods that can be produced with the given endowment. The PPF illustrates the first lesson in economics: Scarcity confronts decision-makers with trade-offs – or as the famous economist M ILTON FRIEDMAN puts it: “There's no such thing as a free lunch”.^[22] I.e., in a state of efficient production, **increasing** the quantity of guns requires a **sacrifice** in butter and vice versa.

(3) The **concave shape** of the PPF reflects **rising opportunity costs**: A rational strategy to expand butter production would first reallocate those inputs less productive in guns production. Consequently, the sacrifice is not too costly – refer to point **A**. In general, the (linear) slope of a tangent (“the rise over the run”^[XXX]) equals the slope of the curve that the tangent “hits” / “touches” in only one point. In the case of the PPF, its slope represents the trade-off between the goods available for production in the investigated state of the economy. Thus, the (efficient) output combination in **A** implies that an increase in butter production by one unit (a “**marginal** increase”) requires the sacrifice of only one gun. In contrast, when the economy is already heavily engaged in butter production, the opportunity costs to even further expand the output in butter are much more significant – refer to **B** where the increase by one unit of butter requires the sacrifice of three guns.

8

Trade-off II: Independence-specialization-trade-off

(1) The **second trade-off** compares the benefits of **division of labor arrangements** with the benefits of **independence**. Already ADAM SMITH^[32] and DAVID RICARDO^[33] highlight how the division of labor is superior to “jack in all trades” approach because of a) different natural conditions of production, b) the natural differences in skills or because c) time is limited. The latter causes skill differences to increase in time; mainly, due to the “**experience curve effect**”^[34]. As time passes, production costs per unit decrease because the players learn through repetition: I.e., at later stages of production, initial mistakes and waste are avoided as efficiency-improving work arrangements are identified. Division of labor also reduces retooling times and it offers the chance of critical feedback by cooperation partners positioned up- or downstream the value chain. Finally, it provides a bigger pool of potential partners for mutual insurance arrangements.

(2) Independence is burdened by the set-up of costly “double-structures” in the self-sufficient entities – the main force responsible for efficiency-improving **synergy** in corporate mergers. However, it naturally offers a greater **variety** in activities and avoids the **coordination** effort required in division of labor arrangements – for example, investments to counter **shirking** problems resulting from asymmetric information (see section [XXX] for the details) are not needed because rational persons do not cheat themselves. It also reduces the **resistance to reforms**.^[35] Reforms in division of labor arrangements will most likely see winners and losers with the latter trying to block the reform. In contrast, the jack in all trades only cares about the reform's net effect. This player type is also superior to division of labor arrangements in identifying potential efficiency improvements by **transferring concepts** from one activity to another due to their involvement in all activities.

9

Trade-off III: Flexibility-concentration-trade-off

(1) The **third trade-off** sees the Clausewitzian impetus on the **concentration of forces**^[24] in time and space colliding with the advantage of **flexibility** in the face of imperfect or asymmetric information. Physical, mental or organizational forces achieve maximum impact by concentration because any diffusion in time and space increases their vulnerability to counterforces – even when the main objective lies “only” in signaling credibly the quality of products or skills. That is why FREDERICK the Great preferred redoubts / strongholds to trench lines in defense operations^[25] or the German general HEINZ W. GUDERIAN forged the motto of “Klotzen, nicht kleckern” in tank warfare^[26].

(2) However, the concentrated employment of scarce resources also unavoidably results in losses of flexibility. Flexibility is important to decision makers confronted with imperfect or asymmetric information because the original decision may become suboptimal after the revelation of new information – which in turn may make it necessary to reallocate the resources already committed. Such adjustments feature costs because of a phenomenon called **entropy**.^[27]

(3) Entropy means physically transforming an object from one state to another cannot be achieved without a loss of energy. For example, turning swords into plowshares results in costs of conversion because of the effort required and because a certain amount of the material involved will be irrevocably lost to future usage. Such “**sunk costs**” create **path dependencies** in organizational development: Even when efficiency-improving methods are identified, their implementation is shunned because the cost of adjustment are considered too high. A well-known example is the German decision in World War II to continue the production of inferior tank designs lacking sloped armor like the Pz III or Pz IV – mainly, to satisfy the frontline demand in endless campaigns. In addition, there is the issue of **mental inflexibility** – focusing on certain topics facilitates the development of analogies, but this also makes the decision maker less receptive to approaches originating from non-related areas.

(4) In contrast to these “active” forms of entropy, its “passive” aspects are covered by the concept of **time**: The world of man features animate as well as inanimate entities continuously exposed to entropy (“**aging**”). Furthermore, subsets of these elements are capable of non-deterministic behavior or even rational actions. The combination of these features is often perceived by humans as **chaos** – implying any set of these entities is actually **unique**. The attempt to order these sets of entities in a sequence is called “time”. The uniqueness of combinations in time has already been highlighted by the Greek philosopher HERACLITUS in antiquity: “No man ever steps in the same river twice”^[28] while its significance to military operations is stressed by the Prussian general A UGUST N. GNEISENAU: “We may recover space, but never the time lost.”^[29] The blend of active and passive aspects of entropy implies that decision makers are confronted with **cost of delay** – the optimal point in time to act (based on a corresponding concentration of forces) has been missed and the impact of the delayed action on the status quo is less than it could have been at an earlier point in time. However, there also exist the benefits of “**wait and see**” strategies: A new technology may become available in the future that transforms previously impossible approaches into sound strategies. Or the information about other players like consumers in markets or opposing forces on the battlefield improves and this offers the chance to formulate a more effective strategy because the latter then reflects the “true” conditions.

(5) Since the 1980s, financial economics has developed a valuation instrument to derive optimal **timing** decisions for investments in the face of the flexibility-concentration-trade-off – the **real options approach**.^[30] It is based on the analogy between investment projects and options as financial instruments – the latter insure investors against excessive market risk in the price development of underlying assets like shares, bonds or commodities. Options offer the right to perform a specific transaction in the future – thus, an option does not imply an obligation to act. E.g., its owner may buy 100 shares of the underlying asset at a (fixed) “strike price” in three months or they may not. Similarly, investment projects offer the opportunity to start a business operation in the future for a fixed amount of money – the initial investment / outlay. However, the value of this analogy between options and investment projects is linked to the validity of the pricing model used to determine the price of options. There are **doubts** that the model of option pricing – taken from physics and centered around the random movement of particles in space – is able to reflect the interactions in economies or even societies; even when adjusted to the experience of market developments in the past.^[31]

10

Reproduction design: Introduction

(1) To highlight the significance of cooperation in the original position, the general formula is now applied to explain vital **design features of reproduction** in evolution-driven settings.^[36] In general, the evolution seeks to maximize the probability of reproduction for the “**fittest**” species. I.e., in regard to the three other basic objectives of life (life sustenance, protection and development), these species possess strategies or (organizational) features that represent optimized reactions to the trade-offs dominating their specific environments.^[37]

(2) Furthermore, such strategies or features can be brought into a **hierarchical order** of underlying decision variables. However, in comparison to the variety encountered in nature, the following explanations should be seen as basic trends or even stereotypes – for example, the analysis compares eggs to grapes while there are birds that rear just one egg.^[38]

11

The Military System of Democracies III: CounteringHobbesian Anarchy – Cooperation in Families

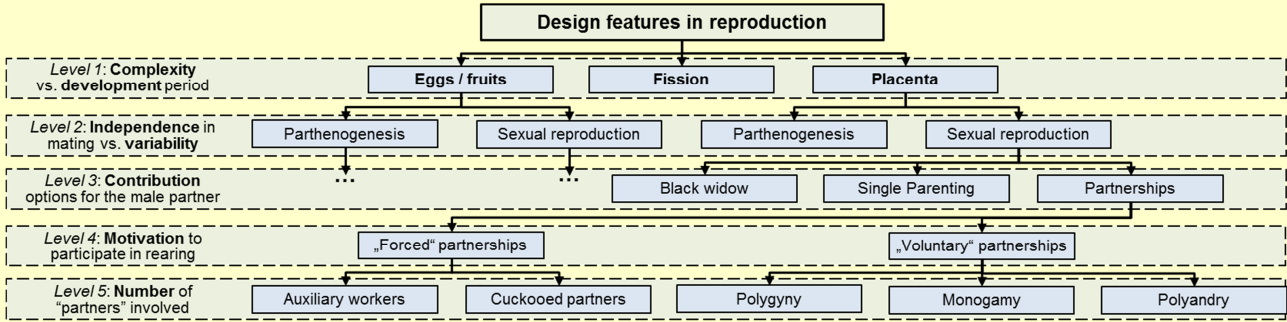
Man’s earthly activity, when inspired and sustained by charity, contributes to the building of the universal *city of God*, which is the goal of the history of the human family. In an increasingly globalized society, the common good and the effort to obtain it cannot fail to assume the dimensions of the whole human family, that is to say, the community of peoples and nations, in such a way as to shape the *earthly city* in unity and peace, rendering it to some degree an anticipation and a prefiguration of the undivided *city of God*. ... The risk for our time is that the *de facto* interdependence of people and nations is not matched by ethical interaction of consciences and minds that would give rise to truly human development. Only in *charity, illuminated by the light of reason and faith*, is it possible to pursue development goals that possess a more humane and humanizing value. The sharing of goods and resources, from which authentic development proceeds, is not guaranteed by merely technical progress and relationships of utility, but by the potential of love that overcomes evil with good (cf. Rom 12:21), opening the path towards reciprocity of consciences and liberties. The Church does not have technical solutions to offer and does not claim “to interfere in any way in the politics of States.” She does, however, have a mission of truth to accomplish, in every time and circumstance, for a society that is attuned to man, to his dignity, to his vocation.

BENEDICT XVI – Encyclical Letter “Caritas in Veritate” (2009, www.vatican.va)

The Beginnings of Cooperation: Evolutionary Design in Reproduction (continued)

Applying the general formula to reproduction design

(1) The following investigation into reproduction design serves **two purposes**: As already mentioned above, it illustrates insights of applying the general formula of action design to reproduction. It also highlights the **link** between the **original position** and **societies**. The defining feature of societies consists in the **moral perspective** that forms the center of the social contract – refer to section [XXX]. In general, morality means that an action cannot only be justified by the player(s) as a rational part of their life concept(s). In addition, the perspective of all other humans has to be incorporated by explaining why they should at least not oppose a specific action by the respective player. It is safe to assume that the beginnings of morality lie in the recognition of oneself in the **mirror** of the others. According to LEONARD D. KATZ, already the Roman politician and philosopher MARCUS T. CICERO postulates that morality originates in the family – in particular, in the mother-child-relationship.^[39]



(2) To reflect these two goals, the investigation pursues the following line of reasoning: In contrast to symbiosis, teamwork (explicit cooperation) is introduced into the original position to tackle specific challenges in reproduction. In turn, the combination of rationality and explicit cooperation causes the emergence of morality that becomes the prerequisite for the rise of societies. The graphic to the left illustrates the set of major design variables that help to highlight the pros and cons of partnerships in evolutionary reproduction design.

(3) On the **first level** of the hierarchy, the benefits of speeding up the independence of the offspring are weighted against prolonged periods of care and protection. Prolonged periods allow to rear up offspring of greater complexity in appearance and skills. The first approach, **fission**, implies the immediate creation of another full-fledged entity. Thus, fission is only available to the most primitive forms of life - e.g., Paramecia. The second approach focusses on the benefits of early independence by relying on **eggs** or fruits as shelters and nutrition depots. These require significant initial investments but reduce the resource requirements for the parents at later stages. This solution also lowers the emotional stress on the parents – in particular, the feeling of being overwhelmed by their new role as parents (refer to the phenomenon of postnatal depression). On the other hand, this solution increases the offspring’s vulnerability to threats like predators or unfavorable environmental conditions. In addition, eggs or fruits imply a lower level of control over the offspring’s successful development and even reduce the quality of feedback. Consequently, “egg solutions” often resemble “**grapeshot**”: The **number** of offspring has to be **maximized** because of its high vulnerability. The third alternative consists in offering protection and additional nutrition by sheltering the fetus in one of the parent’s body for the most critical phase of their development – the **placenta** serves as the corresponding “interface” for most mammals. Thus, the number of offspring and the resources required as initial endowment can be reduced because of the prolonged phase of interaction. But the placenta also implies a higher burden (e.g., the weight of the offspring or its nutrition) as well as increased risk (reduced mobility in confrontations with predators or prenatal complications) to the parental “carrier” – the connotation of military or business organizations is intended to illustrate the generality of this analysis.

(4) On the **second level**, the focus shifts to the act of reproduction. In this context a first element of cooperation is introduced by the evolutionary impetus for **genetic variation**. In general (with the exception of emergency situations where species are brought to the verge of extinction), the **sexual combination** of “female” and “male” animals or plants to produce offspring should be considered superior to **parthenogenesis** – i.e., the reproduction by a single parent. First, the combination lowers the danger of inheriting **genetic defects**. Second, it offers a higher probability of **mutations** that may represent better adaptations to an ever-changing environment on Earth that has already seen several waves of mass extinction: It is estimated that less than two percent of all species which have ever existed still live today.^[38]

(5) The **third level** concentrates on the male’s contribution to the rearing effort **after mating**. **Three basic types** of arrangements exist: a) The concept of the “**black widow**” – the male is devoured by the female after mating. This boosts the initial resource endowment available to develop the offspring. b) The couple immediately separates after mating; the offspring is raised by only one parent (“**single parenting**”) and perhaps released to independence as soon as possible. This represents a preferable approach to the black widow concept, when the required resources to produce mature males are significant due to their complexity. In such cases, they should be available as mating partners for several mating seasons. However, their potential contribution to protect and to rear the offspring is low. c) The third option introduces a **division of labor** arrangement where one party focusses on the role of the offspring’s carrier and the other party concentrates on protection and food.

(6) Division of labor arrangements feature two subvariants in reproduction design – refer to the **fourth level** in the graphic: Either mating partners, strangers or relatives are induced by corresponding **incentives** to “**voluntarily**” participate in this operation – or they are more or less **forced / tricked** to do so. The latter is, for example, the case of worker bees that – due to genetic modification – are not able to produce their own offspring. This in turn reduces their incentive to “oppose” their role as servants caring for the offspring of others – the sentence seeks to draw an analogy to the historical role of eunuchs in the Byzantine, Chinese or Ottoman administration. In contrast, birds that have been successfully targeted by cuckoos as step-parents possess perfectly aligned incentives with their “oppressor” due to their ignorance of the true circumstances.

(7) The **fifth level** distinguishes **three basic design options** in settings featuring voluntary division of labor arrangements. In general, preference for one of these designs may be determined by the actual ratio between potential female and male partners available. In a setting with human players, this ratio may have been affected by casualties of war – as the historical background to the marriage rule in the early Islamic society illustrates which allows one man to marry up to four wives.^[39] a) **Polygyny**^[40] – one male is combined with a “harem” featuring several wives. This option offers the signal that the male possesses particularly attractive genes because it has been able to succeed in a competition against his rivals. But this option also implies a reduced level of care, protection and supply the “pasha” is able to offer to each single female and offspring. In short, polygyny focusses on the male’s function of reproduction and discounts his support skills – for example, it is the lionesses which do most of the hunting. b) **Polyandry**^[41] – one female is joined by several male partners. This arrangement helps to counter a particularly dire / hostile environment and encourages the specialization in various skills among the males. On the other hand, it lowers the identification of the males with the offspring – and hence, their motivation to support it. c) Consequently, **monogamy** represents a “middle of the road” approach with the maximum incentive to rear the own children in constellations featuring a voluntary division of labor arrangement.

(8) All the design options discussed in this section are observed in nature – an illustration of how the **evolution** favors **multiple equilibria** to enhance biodiversity in the face of the great variety of natural environments and the underlying dynamism. Even the three arrangements of polygamy, polygyny and monogamy exist as accepted **family** institutions in different cultures. In addition, adultery is a common experience among humans. However, section [XXX] will show why in the case of rational human beings living under the social contract in societies the **combination** of evolutionary forces and morality results in an “**unstable equilibrium**” with **monogamy** as the principal cooperation arrangement.

The original position: A synthesis

(1) The previous sections introduced the concept of the (hypothetical) original state. The latter serves as a point of reference to sharpen the understanding of society’s main features and primary functions. This is done by focusing on a setting free of the institutional arrangements in societies and exclusively driven by the evolutionary force of self-interest – or what the catholic church calls the “**original sin**”^[42].

(2) This perspective explains how **societies** overcome the limitations to human existence – resulting from the fundamental restriction – by establishing and enforcing a **moral perspective** on human actions: The benefits of cooperation in sexual partnerships and in the care for offspring lead to the rise of the family, adding the “**us**” to the “**I**”. Furthermore, encountering an independent family introduces the “**them**”. This observation is now employed to derive an appropriate description of the general features of the original position.

(3) In this scenario **two families** – capable of rational reasoning, but unrelated and perhaps not even sharing a common language – meet each other in a hostile environment where resources for food, clothing or shelter are scarce. History teaches us that then **anything is possible**: The families may enter a **union**, strengthened by marriage. Or they may start to **trade** things, but remain independent entities. For example, the so-called “silent trade”^[43] – employed by the Carthaginians when trading beyond the Pillars of H ERCULES and described in the works of HERODOTUS, a Greek historian hailing from Asia minor – can be considered as one of the most independent trade relations. But the families may instead focus on **stealing** critical resources or **enslaving** people like young females – the abduction of the Sabine daughters in Roman mythology still finds its cruel counterparts in modern Nigeria, Ethiopia, Somalia, Iraq or Syria. Or one family may outright **kill** the other to monopolize the resources – like the Dutch traders did to control the spice trade on Banda islands in the 1620s.^[44]

(4) In conclusion, **cooperation** – echoed in particular by the institution of the family – and Hobbesian (violent) **conflicts** represent defining features of the original position.^[41] However, the combination of **uncertainty** (caused by multiple equilibria), **repetition** – man faces this scenario for several 100’000 years – and **rationality** eventually results in a phenomenon labeled by the German philosopher GEORG W. F. HEGEL as “**weltgeist**”^[45]: Based on a Hayekian process of **trial** and **error** – FRIEDRICH A. VON HAYEK stresses that the arrival of coordination designs often represents an unintended, accidental result,^[46] rationality seeks to move away from the original position towards a **reduced set** of equilibria, more **stable** and featuring greater levels of **output, efficiency and morality**. This development requires the stabilization by **institutional arrangements**^[47], i.e., the players agree to rely on specific procedures as “blueprints” for certain sets of future actions. Such institutions are initially restricted to certain aspects – e.g., to the exchange of certain goods. However, rational minds are able to **generalize** such arrangements – i.e., identifying and applying the underlying **principle** to more general classes of actions. To analyze the movement from the original position to societies, the following sections will divide this **transition** into a sequence of **three steps**: a) Why are people interested in entering an **agreement** that reduces the set of equilibria in a setting resembling the original position – in particular, banning violence and fraud from their day-to-day interactions? b) How do **moral principles** arise from the changed environment of reduced equilibria? c) Why do some of these moral principles obtain the status of **constitutional principles** to control the complete society design?

The Military System of Democracies IV: The Emergence of “Less-Violent” Environments

The lethal silver fish will fly. // This boat will shiver – men will die. // A cast of millions – a part to play. // Killer? Victim? Or fool for a day. // Obeying an order – men have to die. // Us or them – a well rehearsed lie. ... The lifeboats shattered – the hull is torn, // the tar black smell of burning oil, // on the way down to Davy Jones, // every man for himself – you're on your own. // The wolf eyes watch the crosswire: “Stern tubes ready”, “Aim and fire!” // They can pin some medal on your chest, // but in two more weeks – dead like the rest.

IRON MAIDEN (1990, Run silent, run deep)

When Adam delved and Eve span, who was then the gentleman?

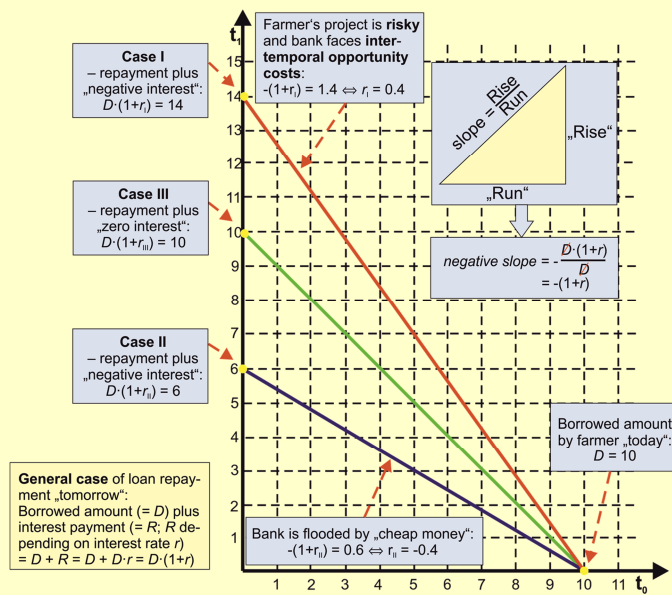
JOHN BALL, executed as ringleader of the English Peasants' Revolt in 1381

The Passage from the Original Position to Society: Institutionalizing the Relations between the “I”, the “Us” and the “Them” (continued)

Step 1: The change for less violent environments

(1) The three steps of the transition cannot be separated in a “watertight way”. Actually, they develop at the same time. The model mirrors this difficulty – in particular, it stresses the interdependence of the rise of markets and organizations to protect this coordination mechanism. To investigate the first step (the advent of less violence), the investigation merges the **Fisher separation** – developed by IRVING FISHER in financial economics to determine the optimal interaction between investment / consumption decisions and capital markets in neo-classical settings –^[51] with MANCUR OLSON's economic model of **roving** and **stationary bandits**.^[52] OLSON's model illuminates the **beginnings** of the **state**. Crime organizations like the **Mafia** appear during the transition from the original position to societies and pursue their objectives based on the principle “might makes right.” They represent stationary bandits and this role induces them to provide an environment **less** prone to **violence** to their victims.

(2) In the economy, capital markets coordinate the economic strategies of players in their **intertemporal dimension** – refer to the graphic on the left. Capital markets bring together two types of players: The first type of players possesses an excess of financial assets like savings or real assets like sacks of seed in the present – the (potential) **creditors**. These players seek to “smooth” their consumption patterns in accordance with their life concepts or organizational visions by **transferring** their excessive assets from “today” to “tomorrow” with minimum losses or even at a profit. The second type of players has identified attractive business opportunities or expects a rise in their income “tomorrow”.

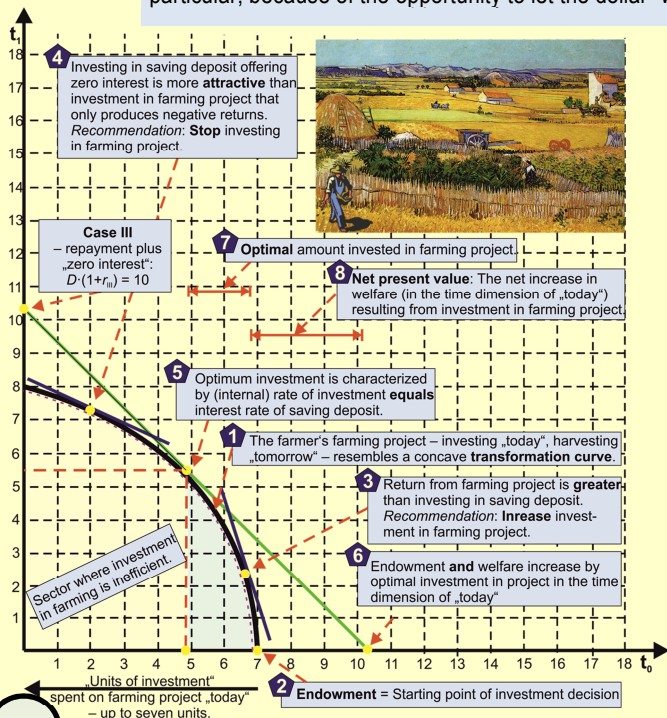


(3) But these players lack the assets to realize their investment projects or consumption plans “today” – the potential **debtors**. Then the parties can enter into **credit contracts** that make them both better off: Creditors offer their assets to debtors “today”. Debtors use the assets in their projects and return them “tomorrow”. This service is **compensated** by payments in financial assets or in kind that reflect a) the intertemporal **opportunity costs** of the creditor who refrains from using the assets for themselves or from offering them to others for the corresponding period. b) The risk that the debtor may not be able to satisfy the claims of the lender “tomorrow” because the projected stream of income fails to materialize – or the debtor may even retreat to spurious claims of being unable to repay the debt (**default risk**). c) The **loss in reuse** the assets experience when employed by debtors. This aspect also covers **inflation**. In time, the purchasing power of financial and real assets decreases due to the increased competition for resources – this in turn is caused by limited supply, entropy, rising population numbers and the introduction of new employment opportunities for inputs. This price development is regularly countered by efficiency gains in production and the discovery of new deposits – compare the price decline for electronic hardware with the explosion of real estate prices in global powerhouses like Singapore, New York, London or Zurich. Another major source of inflation represents the policy by the central bank. The latter can unbalance the relation between the money available for transactions and the real economy by disproportionately increasing the supply of “cheap money”. d) The **scarcity** of excessive assets available for lending “today”. Basically, there are **two types of contract**: The creditor becomes a business partner of the debtor. Because this buy-in changes the ownership structure of the project, it requires institutional arrangements to reallocate the corresponding rights like control, the use and the splitting of the profits, the termination of the business etc.^[53] Such **equity** contracts regularly share the profits in accordance with the respective amount invested by the partners. However, proportionally sharing the power to control is much less common. Perhaps, this feature can be explained by the Roman experience that rotating army command on a daily basis proved to be seriously flawed on the battlefields of the Second Punic War. In addition, the capability to finance a project does not correlate with the management skills required to run a business operation. Thus, the growing demand to finance enterprises comparable in size to small nations resulted in the rise of **stock corporations** characterized by the **separation** of three forces: First, publicly traded shares represent a major source to provide financial resources. Second, the company's supervision is based on a system of “checks and balances” established and maintained by a mix of specific roles of shareholders, external as well as internal agencies.

(4) Third, management control is provided by a board of management specialists led by the Chief Executive Officer (CEO). But – as pointed out by economists like MICHAEL C. JENSEN and WILLIAM H. MECKLING – equity faces problems of its own.^[54] In particular, the discretionary power wielded by management specialists – who also enjoy significant informational advantages over shareholders – may induce them to choose actions that improve their welfare at the expense of the shareholders. The second type, **debt**, reduces the options of the creditor to take control of the debtor's activities. Instead they receive a fixed amount of money “tomorrow” – invariable to the actual profit. This fixed compensation is determined by the **interest rate** r – a ratio compensating in proportion to the loan. In addition, they enjoy higher priority of reimbursement over shareholders when the debtor goes bankrupt.

(5) The world **religions** of Judaism, Christendom and Islam struggled with the issue of **debt finance / usury** because a) the entrepreneurial risks were much higher in antiquity or medieval times when driving up a cart the next hill could already result in the ruin of the whole business operation. Hence, the compensation had to match the risks – the returns of investment of caravans travelling the Silk Road, Dutch spice fleets or Portuguese “black ships” look highly impressive to the modern eye, but must be counterbalanced by failed expeditions / ships lost at sea due to accidents, storms, shipwreck, robbers or pirates. b) The excess capital available for financing is much scarcer in societies featuring “static economies” – i.e., labor-intensive economies experiencing low speed of innovation. Thus, the punishment for bankruptcy – in particular, being sold to slavery – reflects this level of scarcity in the economies of Israelite, Phoenician or Carthaginian societies which generally considered enslavement a legitimate action. c) Until the arrival of the Industrial Revolution, the economies were centered around agriculture. A sack of seed can produce perhaps 50 times of its mass (net production):^[55] For example, it is estimated that an average of 154 kg of wheat is required to seed a field of one *ha* (= 10'000 m²) in modern Germany. This investment results in an average harvest of eight tons. In the face of this exceptional return on investment, creditors asked for corresponding shares of profit – and often succeeded because of their monopolistic position in rural areas. On the one hand, modern understanding of debt finance highlights its function to provide a tailored solution to both parties: Many debtors are not interested in recruiting additional business partners who may “disturb” their operations. Many creditors also prefer a more independent role as the management of corporations and consumption plans is not their field of expertise or it is simply not their “cup of tea”. A strict interdiction of debt would therefore unnecessarily reduce the number of beneficial transactions in the economy or distort their designs and outcomes. Consequently, religious scholars like MUHAMMAD S. TANTAWI consider the interdiction of usury or *riba* as an urge to behave morally justified in finance – i.e., by applying the principle of **reciprocity** (refer to section XXX) in the corresponding transactions – not a banishment of debt finance per se.^[56] In contrast to the claims of critics like E BRAHIM MOOSA,^[57] sheik TANTAWI's view seems to be consistent with the prophet MUHAMMAD's concept of social market economies – in particular, his position on freedom of contract. For example, JOHN McMILLAN quotes an incident in the prophet's life that illustrates the latter's approach to economy design:^[58] When in times of famine the prices for food and other commodities dramatically increased in Medina, the prophet did not give in to the public pressure demanding the introduction of price controls: “Allah is the only one who sets the prices and gives prosperity and poverty.” Perhaps 300 years before, the instrument of price control had been a cornerstone in emperor DIOCLETIAN's attempt to reform the Roman empire after its severe crisis during the third century AD.^[59] According to MILTON FRIEDMAN, this instrument was quickly abandoned because it proved to be unsuccessful: “If controls are administered with any zeal, people find ways to get around them.”^[60] Perhaps influenced by this experience, the prophet selected a different approach to economy design: He combined ADAM SMITH's (welfare-improving) “invisible hand” of the market mechanism – see section [XXX] – with support for the needy, financed by *zakat* (tax). And in this economic system, debt contracts hold the rank of **legitimate counterparts** to equity finance.

(6) On the other hand, debt – like equity – implies a specific incentive structure to creditors and debtors that may result in **coordination problems** in settings hampered by incomplete or asymmetric information. For example, fixed repayments may induce the debtor to secretly **swap** the original project – responsible for the corresponding interest rate the parties agreed about when signing the contract – for a **riskier alternative** that requires an increase of the interest rate.^[61] If the risky investment turns out well, the debtor simply pays out the creditor and gets away with an extra profit. If the exchange goes wrong, they claim the original operation had failed or even file for bankruptcy. The graphic above introduces a farmer who seeks a creditor to finance their investment project. To highlight the similarity of the two basic designs, it is deliberately left open in this paragraph if this raise of external capital is done by equity or debt. The investment requires an investment of 10 units “today” – for example, ten sacks of seed. As already mentioned, the scenario is based on a **neo-classical setting**. The implications of this assumption will become clearer in section [XXX]. Here it suffices to highlight two features: a) the players face perfect instead of asymmetric or incomplete information. Thus, farmer and creditor are able to “perfectly” predict the average harvest that will result from seeding ten sacks. In addition, no one is able to cheat in regard to the number of sacks traded, their quality or the way they are used. b) The capital market is perfectly **competitive**. This excludes situations where one party could use its market power to dictate the conditions of the financial contracts to their counterparts. The model then investigates three constellations: Case I illustrates a risky investment which requires a repayment of 14 units “tomorrow”. The **line of capital transformation** connects the corresponding two points in time – “today” and “tomorrow” – when the cash outflow to the debtor and the cash inflow to the creditor occur respectively. Two features of the line are basic to the following analysis. First, the line features the negative slope of $-(1+r)$ because the repayment represents the sum of two components – the original loan and the compensation determined by r . Second, the line illustrates the **“time value of money”**. One dollar “today” is not the same as one dollar “tomorrow” – in particular, because of the opportunity to let the dollar “work” in investment projects. Thus, to compare payments occurring in different points in time, they need to be “condensed” in one point in time.



(7) Financial economics conveniently use the present / “today” for this task. Then the condensation is achieved by **discounting** the **future value** (= FV) to the present: In case I, the **present value** (= PV) of receiving 14 units “tomorrow” is 10 units “today” because $PV \cdot (1+r) = FV \Leftrightarrow PV = FV \cdot (1+r)^{-1}$. In Case II the transformation of 10 units “today” results in a **decrease** to 6 units “tomorrow”. This can be explained by recent experiences in the Swiss financial sector. The severe crisis of public debt in the European Union forced many financial investors to withdraw their deposits to “safe havens”. The resulting “flood” of capital – a significant change in the scarcity of financial assets in Switzerland – drove Swiss interest rates down. However, even a negative return on investment – by the combination of very low interest rates, taxes and inflation – did not deter many investors because they preferred this “small loss” to the looming losses of staying in the European capital markets. Finally, if there are constellations possible that feature positive as well as negative returns of investment, there also must be a scenario featuring zero interest – refer to Case III. This model of capital markets is now applied to determine the **optimal amount of investment** in a slightly modified setting – refer to the graphic on the left. It is assumed that one farmer owns seven units of seed “today”. He faces two options: Either he can lend them to other farmers for an interest of zero at the capital market – this interest level is selected to facilitate the following analysis. Or he can use all or some sacks in his own project: Sowing his field. The project's return on investment is described by a **concave transformation curve**. Its concavity exhibits the economic law of “**diminishing marginal returns**” – while each **additional** (“marginal”) unit invested increases total output, its contribution is smaller than the additional output of the preceding unit invested. E.g., the profit contribution by the first shop of a chain of stores in a specific region is higher than the corresponding profit of the second shop etc. This **saturation** effect is caused by the limits of each market: “Trees won't grow into the sky.” The farmer's **optimal investment** is determined by comparing the return of investment of each alternative for each unit invested: The project's return on investment is graphically illustrated by the (negative) slope of the transformation curve – refer again to section [XXX]. As long as the slope of the curve is greater (the negative signs cancel out) than the slope of the transformation line, the farming project represents the better investment. Due to the concavity of the transformation curve, its slope decreases with each additional unit invested. In contrast, the slope of the transformation line remains constant. Thus, there is a point on the transformation curve where both investment alternatives feature the same slope – here the transformation line becomes the **tangent** of the curve. Additional investments in farming beyond this point are inefficient because the capital market offers higher returns. Consequently, the optimal investment is determined by the tangency solution with an investment of about 2 ¼ units “today” resulting in 5 ½ units “tomorrow”. This future value also represents the present value of the project due to the interest rate of zero. In conclusion, the optimal investment in the farming project increases the present value of the farmer's wealth from seven units to 10 ¼ units. Hence, the project's **net present value** (NPV – the increase in welfare in the present) is 3 ¼ units.

The Military System of Democracies V: Roving Bandit versus Stationary Robber

Now Cain said to his brother Abel, "Let's go out to the field." And while they were in the field, Cain attacked his brother Abel and killed him.
Genesis 4:8 (New International Version), www.biblegateway.com

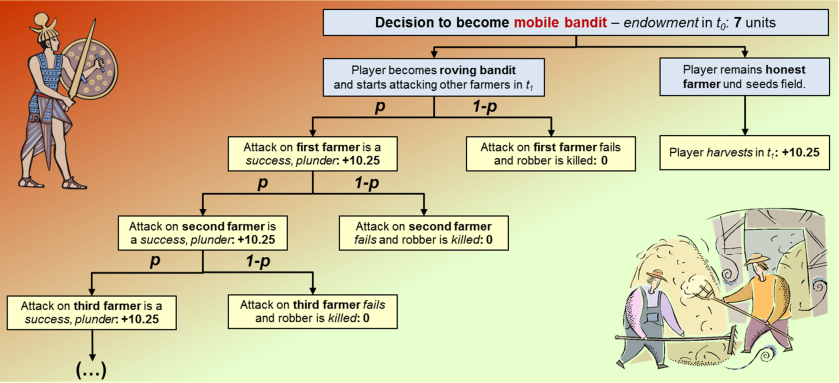
<Medium shot of another part of the countryside with grass and trees in the foreground. The bandits gallop past in the background. Pan left with them as they gallop up an incline. Dissolve to a high-angle medium shot of the bandits, seen from behind, where the roofs of houses can be seen. They move forward slightly, to get a better look. Medium close-up of the BANDIT CHIEF and his CAPTAIN> CAPTAIN: "We'll take this place next." <High-angle long shot looking down on to the village. It is peaceful and quiet. Smoke drifts up from one or two chimneys. The bandits agree noisily, off. Low-angle medium close-up of the CHIEF on his horse, with the horse's head nearest camera.> CHIEF: "We took it last autumn. They haven't got anything worth taking yet. Let's wait." <As he speaks he has difficulty in controlling his horse, which swings round and round. Low-angle medium close-up of the CAPTAIN on his horse,> CAPTAIN: "All right. We'll come back after the barley harvest."
AKIRA KUROSAWA ET AL. (1954 – movie script "Seven Samurai"), www.soma.sbccc.edu

The Passage from the Original Position to Society: Institutionalizing the Relations between the "I", the "Us" and the "Them" (continued)

Step 1: The change for **less violent environments** (*continued*)

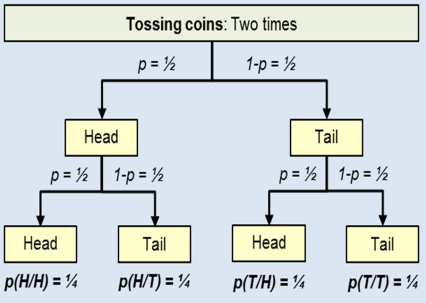
(1) The FISHER model of capital markets is now used to explain why the original position – internal cooperation in families and clans while outside relations often deteriorate into endless feuds due to systematic instability – will eventually be superseded by a **transitional scenario**, more stable and less prone to violence. This change starts with an **exogenous shock**: One of the farmers discovers how to forge **weapons** like sword and shield that grant military dominance over the other farmers for the next harvest season: "Quis fuit, horrendos primus qui protulit enses? Quam ferus et vere ferreus ille fuit!"^[62]

(2) This inventor lives in a landscape dotted with "cloned" farms – the assumption of identical conditions and players helps simplifying the modeling. The landscape's "cloned" inhabitants currently experience an uneasy peace. Intertemporal opportunity costs are zero. Each farmer owns an endowment of seven sacks of seed and faces the same farming project described in the previous section: An optimal investment of $2\frac{1}{4}$ units "today" (= t_0) produces a NPV of $3\frac{1}{4}$ units. Finally, costs of living are ignored in this scenario.



(3) The discovery confronts the farmer with the following decision problem – refer to the graphic on the left. He could remain a **honest farmer** and harvest $10\frac{1}{4}$ units "tomorrow" (= t_1). Or he could decide to become a **robber**: He trains his combat skills until the harvest season ends and then starts attacking his neighbors. It is estimated that he may win each fight with a **probability** of p with $p \in (0,1)$. It is assumed that otherwise he always ends up getting killed. Hence, his defeat occurs with the probability of $(1-p)$ and implies a welfare reduction to zero. If the robber wins, he **exterminates** the victim's whole family to avoid any witnesses of his crime and to preempt any possible revenge in the future. All attacks will happen only in t_1 . After the successful conclusion of this spree of raids, the marauder will – similar to the disturbing ending of O LIVER STONE's movie "Natural Born Killers" – **return** to his land and simply continue **farming**. It is assumed that **no conquest** of additional land is feasible due to the small size of the robber's own family and the primitive level of agricultural technology available. Thus, the periods after t_1 can be **excluded** from the following analysis. If the robber attacks n farmers in a sequence, what are his chances to survive these raids? Because the attacks occur in sequence, the formula to answer this question calculates the **probability of independent events** occurring **together**. This formula is also applied to calculate the probability of two "heads" occurring (= $p(H/H)$) when a (fair) coin is tossed two times – refer to the graphic below that offers an informal explanation of the formula.

(4): The probability of tossing head in one throw is $p = \frac{1}{2}$. Then the probability of tail is also $(1-p) = \frac{1}{2}$ because the two events **exclude** each other. Tossing the coin two times can result in four outcomes: $p(H/H), p(H/T), p(T/H), p(T/T)$. Each event possesses the **same probability** to occur – hence, $p(H/H) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$. However, DEBORAH J. BENNETT points out how long it took to establish this assessment as accepted "fact" in probability theory: "The celebrated eighteenth-century mathematician Jean Le Rond d'Alembert, who was one of the most influential scientists in France at that time, argued that the chances of throwing a head in two tosses was $\frac{2}{3}$. D'Alembert thought the equally likely outcomes were a head on the first toss, a tail followed by a head, or a tail followed by a tail. Since two out of three results contain a head, he came up with the incorrect probability of one head in two tosses as $\frac{2}{3}$."^[63] In conclusion, the formula for the joint probability of independent events is calculated as the **product** of the respective single probabilities. To analyze the farmer's decision to become a roving bandit or to stay peacefully in his field, it is assumed that the farmer represents a rational player only interested in **maximizing** his payoff. In addition, his actions are determined by **risk neutrality**. This type of player is – in contrast to risk-averse or risk-loving players – indifferent between risk-free (aka "sure" or "certain") payoffs and those risky payoffs that offer the same amount as **expected value** of the underlying "lottery" – i.e., the risky payments are weighted by their respective probability of occurrence and added together. For example, the expected value of a lottery – paying CHF 100 for head and CHF zero for tail – is CHF 50.

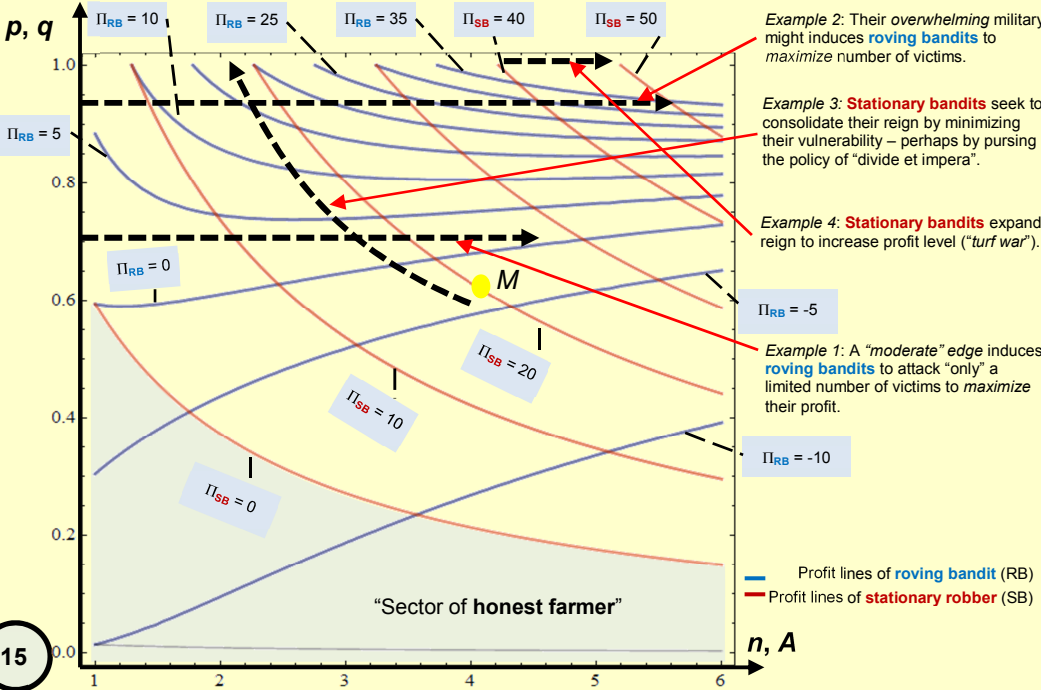
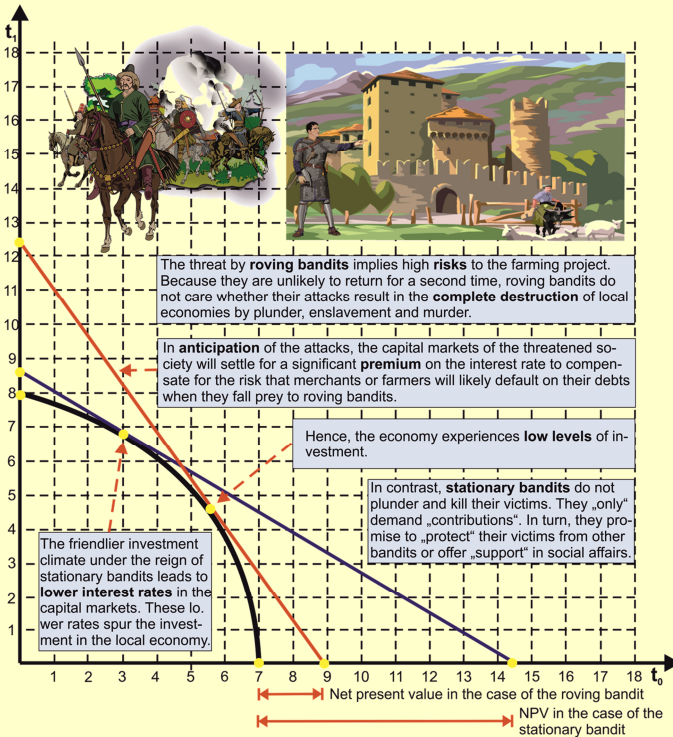


(5) Successful attacks on n farmers add n times 10.25 units as booty to the bandit's endowment of 7 units. Because in all other cases the marauder gets killed, the expected value of the raids to the roving bandit, EV_{RB} , is then calculated as: $EV_{RB} = \underbrace{p \cdot p \cdot \dots \cdot p}_{n \text{ times}} \cdot (7 + n \cdot 10.25) = p^n \cdot (7 + n \cdot 10.25)$.

(6) To have the farmer prefer the income by raids to the farming alternative, the EV_{RB} must beat this benchmark – hence: $EV_{RB} = p^n \cdot (7 + n \cdot 10.25) \geq 10.25 = NPV_F \Leftrightarrow p^n \cdot (7 + n \cdot 10.25) - 10.25 \geq 0$. The setting is now slightly modified to introduce a third type of player, O LSON's **stationary robber**: After some time, the weapon innovation starts to become **common knowledge**.

(7) In history, there seems to exist only one weapon technology that successfully escaped this fate so far: The "Greek fire" of the Byzantine empire – most likely, a forerunner to napalm that saved several times the capital, Constantinople, from attacking fleets.^[64] Then an equilibrium between farmers and roving bandits will emerge – similar to the evolutionary equilibria between carnivores and herbivores in nature. Some of the farmers will choose the path of the roving bandit because they are **better suited** to combat. However, if too many choose this profession, then the population may go extinct because its agricultural base will be disrupted beyond recovery. In contrast, the farmers are comparable to swarms of sardines with each sardine simply hoping to be spared from the attacks by predators. Before the conclusion of the harvesting season, the farmers are not able to organize **preemptive strikes** because the bandits – like the Magyars in medieval times –^[65] stay outside their strike range. During the harvest, the farmers are not willing to mount a coordinated operation because then everybody only cares about their own fields: "Better them than us." The threat by bandits forces the farmers to adjust the **risk** of their farming project resulting in an increase of interest rates at the "capital markets" or reflecting their personal intertemporal opportunity cost. In turn, the optimal investment **level is reduced** – refer to the graphic below. This economic downturn is similar to the slow, but steady decline experienced by the Roman empire when the relative stability of the first century AD gave way to insecurity as many provinces suffered from repeated periods of rebellions, plagues, civil wars and barbarian incursions.^[66]

(8) However – to simplify the analysis – the investigation sticks to the original value of the NPV under the threat of the roving bandit – 10.25 units. In this setting, the stationary robber emerges as the third type of player. Their introduction is mainly motivated by the insight that the income per farm can be increased by offering higher levels of protection. In turn, this improved "**investment climate**" increases the NPV – refer again to the graphic on the right. The "catch" of this approach is that protection naturally requires coordination effort in defense activities. This reduces the bandit's mobility and **increases** their **vulnerability** to attacks by roving bandits or rivals. Consequently, defense technologies of static warfare – rendering strongholds impregnable or self-sufficient when under siege – gain in importance. The model reflects these observations by modifying the formula calculating the stationary bandit's **expected value** of income, EV_{SB} : First, the variable determining the success of their protective operations is changed from p to q with $q \in (0,1)$ to reflect the increased vulnerability. Second, because the bandit's focus shifts from plundering to increasing the NPV of the farming project, a multiplier A with $A \in [1,6]$ is introduced to describe the **NPV premium** generated by the additional protection. The model ignores the **fourth player type**, serving as a "serf" under the reign of a stationary bandit, and focusses on the option of farming without additional protection. Thus, the expected value of pursuing the "career" of a stationary bandit is: $EV_{SB} = q \cdot (7 + A \cdot 10.25) - 10.25$. The graphic below compares the choice between the two types of bandits in different constellations by highlighting their respective **profit lines** – i.e., combinations of p and n or q and A resulting in the same expected value. There exists a sector – shaded in green – where both options are **inferior** to farming. This can be caused by a) an armament offering only insignificant advantages compared to agricultural tools like axe or sax, b) the vulnerability of armored infantrymen to hit-and-run attacks by lightly armed farmers, c) the attempt to attack too many farms at once, d) trying to defend too many farms and e) it may reflect a disequilibrium where bandits roam "target-poor" areas or face well-hidden farms. The simple model identifies two basic strategies available to the roving bandit. A moderate probability of success induces the bandit to restrict their number of attacks – refer to the arrow in *example 1* that hits the zero profit line when increasing n beyond a certain level. Perhaps, this constellation provides the background to criminals telling the police after their arrest that they were just caught during their "final job before returning to a regular life". In contrast, high probabilities of success motivate the bandit to engage in **endless campaigns** of destruction.



(9) This strategy – refer to the *second example* – is echoed by the lives of GENGHIS KHAN or TAMERLANE who killed millions to satisfy their lust for plunder.^[67]

(10) "Conquest was only possible for as long as he could keep his armies in the field. Steppe tribesmen traditionally would remain loyal to a leader for as long as he proved victorious in battle. There were no salaries. ... His military career was one long campaign, punctuated with only the briefest of interludes; he needed to keep his armies on the move."^[68] The strategies of the stationary bandit become clearer by focusing on the specific combination M as a **starting point**. The bandit may decide to move "north" or "northeast" – i.e., he invests in additional security that will increase the NPV generated in their "fiefdom". However, this approach is often **not feasible** in static economies. In addition, the NPV's increase will attract additional bandits – an effect that contributed to the implosion of the Assyrian empire at the height of its power around 600 BC.^[69] Thus, many bandits prefer to trade additional security for shares of the NPV – refer to the **movement along** the profit line in *example 3* – by installing a **feudal system** of loyalties between *overlord*, *lords* and *vassals* or by setting up a *mafia* organization featuring *don*, *consigliere*, *capos* etc.^[70] Only after considering his reign sufficiently secure, the bandit **strikes** for a new level of income by **expanding** his fiefdom – refer to *example 4*. Often former allies are the first victims because the bandit is familiar with the enemy's turf, may use his connections to undermine loyalties and is able to stage a palace coup that minimizes – to keep the organization operational – casualties. Historical examples for the strategy of "turning against former comrades" are: G AIUS J. CAESAR and GNAEUS POMPEIUS, TEMUJIN (GENGHIS KHAN) versus JAMUKA and TOGHRUL, TAMERLANE and AMIR HUSAYN, ADOLF HITLER and ERNST RÖHM, and JOSEF W. STALIN versus LEW B. KAMENEV and GRIGORI J. SINOWJEW.

The Military System of Democracies VI: Stationary Robbers as Promoters of Morality

Because there is nothing proportionate between the armed and the unarmed; and it is not reasonable that he who is armed should yield obedience willingly to him who is unarmed, or that the unarmed man should be secure among armed servants.

NICCOLÒ MACHIAVELLI (1532 / 1908), www.constitution.org

They were the emperor's most immediate line of defence; they could also, on occasion, be his most deadly enemies. Throughout their history the Guard were all too aware that they could make or destroy emperors as they wished. And yet, when they did so it was almost always for their own selfish and immediate reasons rather than out of any wider political conviction or need. Numerous Prefects of the Guard intrigued and fought for power, but the mass of the Guard tended to stay neutral unless their own interests were directly involved.

BORIS RANKOV / RICHARD HOOK (1994, p.1)

I am bound by duty and honor. If you had time, I would explain what that means.

The Yakuza godfather SUGAI to the police officer NICK CONKLIN in RIDLEY SCOTT's 1989 movie "Black rain", quoted in: DAVID H. BUDD (2001, p. 53)

From the Reign of Despotism to the Emergence of Morality

Step 1: The less-violent environment – a summary

(1) The previous model – exploring the transition between the original position and societies – identifies four types of players vital to this setting: The roving bandit, the stationary bandit, the independent farmer – resembling colonists in border regions evading harassment in religious matters or taxation – and the serf working under the protection of stationary bandits.

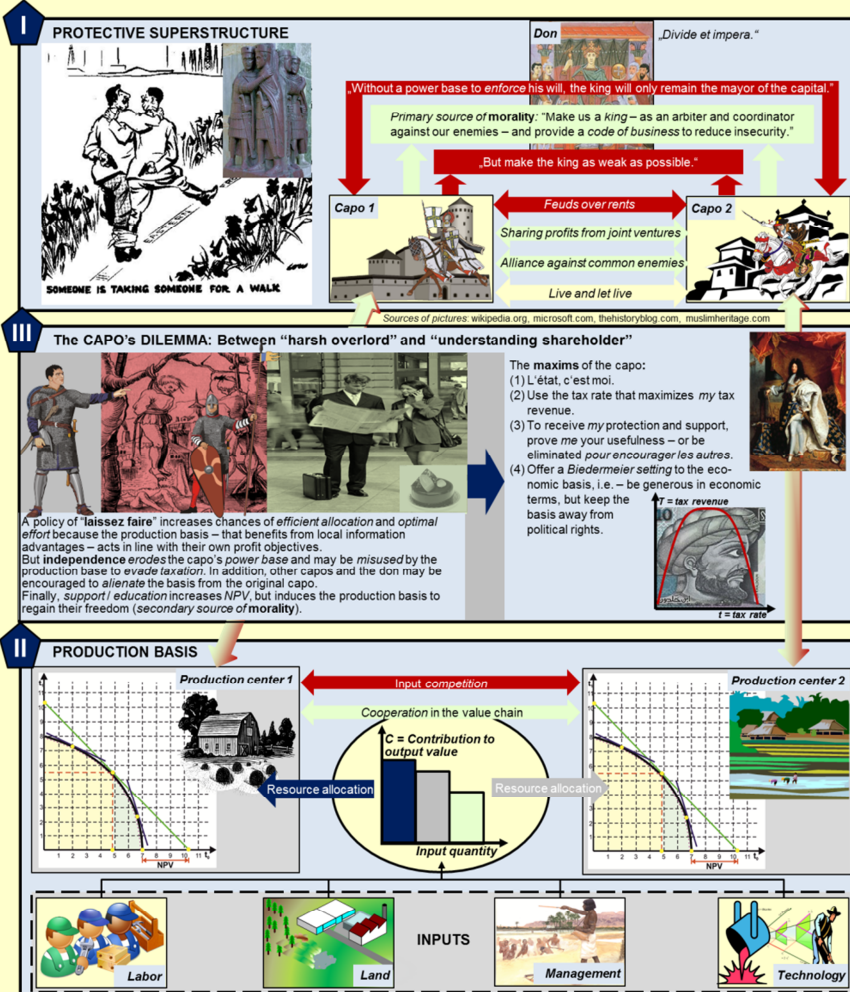
(2) The combination of OLSON's perspective on the advent of the state with FISHER's basic model of capital markets also offers more **direct benefits** to security studies. E.g., it helps to debunk such myths like the existence of underdevelopment due to "**national traits**": E.g., after the 30 Years' War, "the" Germans were notoriously known as "lazy people" in Europe. Instead of retreating to clichés – in more recent times, a Swiss intellectual repeatedly conjures up the images of Germans as "people of the forest" and Swiss as "people of the cave" to explain political issues between the two countries, ^[74] the investment model explains more convincingly this historical verdict about German laziness as a result of living under the constant threat of pillaging bands of mercenaries or deserters.

(3) **Announcing interventions** in failed states induces stationary bandits – who suspect that they and their operations will then become targets of policing operations – to adjust their actions to those of roving bandits. Thus, the invention will often be foreshadowed and accompanied by a further deterioration of the economic climate. This trend should be incorporated into the **public relation strategy** of the intervening forces. Finally, the relations between stationary bandit and serfs are **free** from **moral** influence. "The Sopranos", a TV show about a Mafia clan from New Jersey, offers several examples to illustrate this statement. For example, in the episode "Where's Johnny?" the business of a gardener is brutally disrupted by the return of a mobster who just served his prison sentence and who is eagerly looking for new sources of income. Despite being under the "protection" by one of the capos, the gardener ends up severely beaten, his business is halved to finance the mobster, one half of the reparation payment for his injuries is swallowed in secret by the capo, he is forced to do some additional work for the "upper management" and – to add humiliation to physical damage – he is "persuaded" by the capo that this is all "good news". Consequently, the analysis has to introduce a **second step** to identify the causes for the emergence of morality in the transition phase.

16

Step 2: The birth of morality in the honor code of the "Mafia"

(1) The graphic below suggests that the origin of morality to coordinate interactions beyond the level of the family does not lie in the (economic) relationships between serfs. In addition, the **antagonism** between master and servant offers **no realistic chance** to overcome the transition as it represents a single-sided affair of command and control exercised by the stationary bandit over serfs: The slave revolts that had – according to surviving sources – the biggest impact on the Roman society (in particular, the famous one led by S PARTACUS) occurred in the second century / first century BC ^[72] and still it took more than 1'800 years to eventually establish the societal consensus through the US Civil War that "free" countries and slavery are strictly incompatible.



(2) Instead, it can be argued that the relationships between stationary bandits struggling for a **balance of power** represent the major source of morality. It is here where (educated) **rationality**, the **power** to enforce coordination design based on rational insights and the **necessity** of stabilizing interdependent relations – threatened by clashes of interests – converge to promote progress. The constellation of these bandits resembles the famous caricature commenting on the HITLER-STALIN Pact of 1939 (alias "MOLOTOV-RIBBENTROP Pact"). As mentioned before, stationary bandits may share common interests, but they also may become enemies in their attempts to expand their fiefdoms. The crisis of the Roman empire during the third century AD offers arguably the best illustration of an unregulated situation between stationary bandits. However, the interpretation of the **reichskrise** as a coordination problem between stationary bandits requires a sketch of the development leading to this crisis.

(3) According to EGON FLAIG, the Roman empire never found a convincing answer to the **usurpation** problem, ^[73] i.e. – the differentiation between legitimate claims to reign as emperor and illegitimate claims. Instead, an emperor differed from his rivals only in the aspect of timing as his attempt to seize the throne and the acclamation by a military unit had simply happened earlier. During the third century AD, this deficit resulted in a quick changing sequence of "soldier emperors". They often only survived until the troops found someone else who would even made a higher bid for their support. ^[74] From an economic point of view, this crisis stresses two insights: First, coordination designs have to **reflect the forces** that determine the players' **incentives**. Second, designs must be able to **channel** these forces in accordance with their objectives. The rise of Rome after the fourth century BC can be traced back to its **superior combination of constitution and military organization**. After the (mythical) expulsion of Rome's last king – LUCIUS T. SUPERBUS – in 509 BC, the clash of interests between social segments resulted in a constitution that tried to reconcile the antagonism between "plebeians", "knights" and "patricians" by offering each group guaranteed options to participate in political issues – e.g., the introduction of *tribuni plebis* as political agents of plebeian interests. In contrast, it seems the Roman alliance system did not differ greatly from those of their rivals like Carthage. For example, the Romans fought a war of annihilation against the Celtic tribes in Northern Italy – fueled by their hatred for the conquerors of Rome in 389 BC.

(4) However, the **greater internal cohesion** of the Roman population proved to be decisive in the military conflicts with the Etruscans, hill tribes like the Samnites, the Celtic tribes of the Po region, the cities of Magna Graecia, Carthage or the successor states. Because this cohesion allowed Rome to send out waves of **militia armies** that often – in comparison to the professional armies of their adversaries like Epirus or Carthage – proved to be badly led and of dubious quality. But these armies were able to conquer in **wars of attrition** significant parts of the Mediterranean world. After the destruction of Carthage and Corinth in 146 BC, this period of Roman expansionism faced a deep-going crisis as the **drawbacks** of the **militia system** – already challenged by the pressure on wages caused by the flooding of Roman labor markets by enslaved war captives – became even more visible: In general, the militia system is put under severe stress by prolonged service in countries far away from home and that can only offer – in comparison to the opportunity cost of income forfeit at home – insignificant booty. The USA had to repeat this experience of the wars Rome fought in Numidia and Spain. when the unpopularity of counterinsurgency operations in the "backwater theater" of Vietnam forced the USA to factually end the draft in 1973. ^[75]

(4) The Roman reaction to the "militia crisis" – "exploited" by their Italian allies to force a redesign of the political system – consisted in the so-called **Marian reforms** that centered around the **switch to professional forces**. The impacts of the Marian reforms provide an illustration of an insight central to modern economics – ^[76] a design change always alters the players' explicit and implicit incentive structure and results in secondary effects which may force the **incorporation** of additional **design elements**. In general, professional armies have to **compete** with wages paid in the **civilian economy**. Ignoring the time value of money and the different risks involved – surprisingly enough, JACK E. MCCALLUM claims that the life expectancy of Imperial legionaries even exceeded those of civilian workers by five years; ^[77] most likely, the excellent medical service compensated for the greater risks in combat and civilian life was much riskier back then – this competitiveness in wages can be achieved through **three levers**: a) the basic salary paid during service in peace or war, b) the booty collected during or in the aftermath of combat missions or c) the pension – this includes the famous grants of farming lands to veterans. As highlighted by ANTHONY DOWNS, ^[78] politicians focus on the much shorter periods of election cycles. This short decision horizon tempts them "to overlook" this competitiveness requirement when trying to gain additional public support for the "cost-neutral" introduction of professional armed forces or in times of national crisis. For example, the Carthaginian leadership – facing harsh war reparations after the First Punic War – tried to betray the mercenaries of the Sicilian campaign and paid dearly for it. More recently, US veterans are confronted with the insight that their military careers result in an income level after retirement that is barely able to cover subsistence level or that their well-being will be further disrupted by a health system incapable of coping with their mental and physical injuries. ^[79]

(4) This coordination problem of "**moral hazard**" – see section [XXX] – induces professional soldiers to look for a stronger **synchronization** between their service performance and the corresponding stream of income in time. In ancient Rome, the person to get this job done – because he sufficiently depended on the legionnaires' effort, controlled the amount and the distribution of spoils of war and who could throw in his reputation to guarantee the stream of payments and its stronger linkage to the present – was their **commanding general**. In turn, their bond with "*Senatus Populusque Romanorum*" weakened. In the first century BC, generals like LUCIUS C. SULLA, GAIUS MARIUS, LUCIUS L. LUCULLUS, MARCUS L. CRASSUS, POMPEY the Great, GAIUS J. CAESAR and MARCUS ANTONIUS amassed fortunes and corps of loyal veterans in campaigns that often defied the senate's original orders. These resources enabled them to bid for the ultimate price in Roman politics – becoming **dictator for life** (alias king, don, imperator / emperor, shogun, Caesar / Kaiser / Czar etc.). When GAIUS OCTAVIUS eventually achieved this goal by defeating CLEOPATRA and MARC ANTONY after a long period of civil wars, he faced the legitimation problem described above. In this situation, there are (initially) **three options** available: a) The dictator can hide behind the claim that his sole motive was restoring the old order. To underline the credibility of this claim he may step down like SULLA after a period of stabilization. Otherwise, this claim will wear thin after a while. But more importantly, this approach does not only ignore the evolutionary force of reproduction that results in the temptation to found a dynasty. It also leaves intact the underlying incentive structure. Thus, it is only a matter of time when the new vicious cycle of civil wars will start. b) The dictator may dissolve the armies to remove the power source of usurpations and lure the potential rivals into burning their wealth in "fireworks" at the courts of Versailles or Edo. However, this solution only worked in the case of the Tokugawa clan after I EYASU's victory at Sekigahara in 1600 because the island position of Japan favored the shutdown of foreign relations (e.g., the expulsion of foreign traders and monks from Spain or Portugal) and provided additional reaction time to counter the threat of sea-borne invasions by neighboring countries. Not surprisingly, this period resulted in slowing down the economic development in Japan – offering a rewarding case study to the Swiss search for the optimal level of political autonomy and economic autarchy – and it only came to an end in the 1860s when technological advances in naval warfare allowed for long-distance power projections. c) The dictator may concentrate under his command a critical mass – capable to crush any coup attempt – of elite soldiers, "spoil" them by a highly competitive salary and lead them in person (or by highly-trusted clan members) in campaigns. This is the main motivation behind historical units like the Praetorian Guard, the Varangian Guard, the housecarls in various Germanic societies, the Janissaries, the Streltsy, the Waffen-SS and the Republican Guard. The introduction and maintenance of this dual military organization faces three challenges. First, it often strains logistics and results in an inefficient rivalry with the regular forces. Second, military threats must be concentrated on one or very few fronts that allow for the quick transfer of the guard to participate in key operations. Third, the guard unit will eventually become aware of its role as kingmaker and seek to maximize their income by staging coups based on bribes that outbid the salary of the incumbent dictator. This threat can be countered by a **code of honor** that – in the case, the dictator is forced to resign or is assassinated – forces the guards responsible to retire or even commit suicide. Or the whole unit is dissolved or even eliminated and replaced by an outsider alternative because the original guard is considered "unreliable" – the fate of long-serving elite guards like the Janissaries or the Streltsy. Finally, the unit's reputation will often be damaged beyond repair if the guards try to exploit their position in repeated transactions – how can usurpers entrust their lives to soldiers who had betrayed their former masters or commanders? In particular, the year of the four emperors (69 AD) reveals that often the downfall of an emperor required a **more complex interplay** between the civilian economy, the frontline troops, Praetorian Guard and candidates for usurpation. The next section investigates these relations in greater detail and explains why only in the 17th century AD the solution to the usurpation problem emerged that is still applied in modern democracies.

17