#UT Economic History Reading Seminar 2017/10/26

Zhu Xuanli

Contract enforceability and economic institutions in early trade: The Maghribi traders' coalition *A Greif - The American economic review, 1993*

Before the reading: 1. why do we need models in economics?

By Keynes (1938)

> Economics is a science of thinking in terms of models joined to the art of choosing models which are relevant…

By Ariel Rubinstein in "Lecture Notes in Microeconomic Theory"

> The word “model” sounds more scientific than “fable” or “fairy tale”,but I don’t see much difference between them. The author of a fable draws a parallel to a situation in real life and has some moral he wishes to impart to the reader. The fable is an imaginary situation that is somewhere between fantasy and reality. Any fable can be dismissed as being unrealistic or simplistic, but this is also the fable’s advantage. Being something between fantasy and reality, a fable is free of extraneous details and annoying diversions. In this unencumbered state, we can clearly discern what cannot always be seen from the real world. On our return to reality, we are in possession of some sound advice or a relevant argument that can be used in the real world. We do exactly the same thing in economic theory. Thus, a good model in economic theory, likea good fable, identifies a number of themes and elucidates them. We perform thought exercises that are only loosely connected to reality and have been stripped of most of their real-life characteristics. However, in a good model, as in a good fable, something significant remains.

Thus the advantage of using economic model:

1. clarify words and ideas with no ambiguity in definition and logic

   - make sure everyone know what the others are talking about and what their assumptions behind

2. Modeling is not inductive but deductive thus can be scale up!

   - thus we can get clear estimation from a mix of factors and cusualities, which is always intractable and is sometimes against intuition

3. It can be tested!

Before the reading: 2. why do we need models in economic history?

1. Economic History is the application of all fields of economics and also a place to test them all.

   E.g.1 path dependency ← nash equilibrium

   E.g.2 natural experimental/randomized trial

   E.g.3 identifying problem

"Every [empirical] economist is an economic historian. The only difference is that economic historians look further back in the past." On doing economic history - Vincent Geloso

2. Uses history to bring theory to life (in the words of Douglass North)

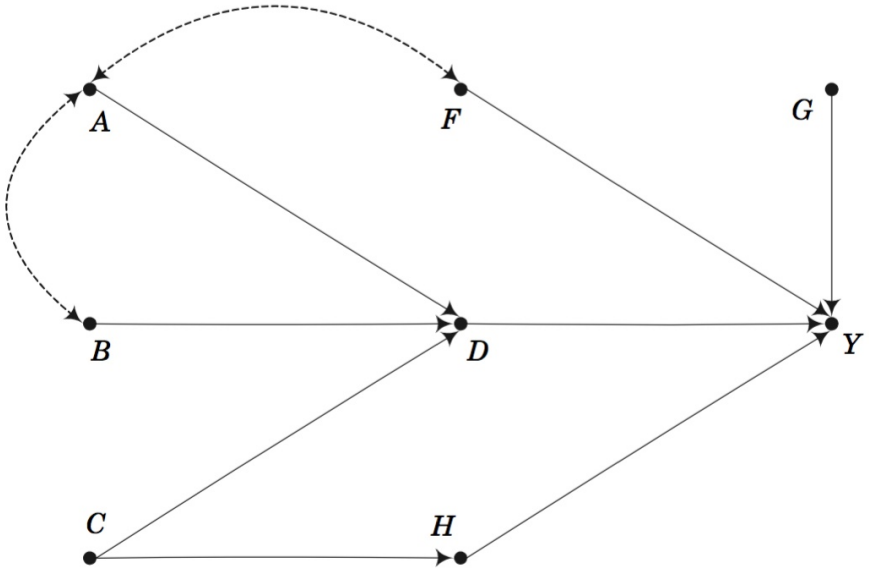
   - Yes, Economics is a deductive science through which a variety of human behavior and economic results are derived from elementary factors and axiomatic statements. But these elementary factors and axiomatic statements are derived by induction!

   "history is more about an analytical approach which based on facts, than about particular period of time or issue."

Before the reading: 3. The Caveats

1. History can be extremly complicated

   a causal diagram - Judea Perle (2000)



<!-- If Y is industrial revolution, which factors are the most important? -->

2. While math is actually simple!

   - remind that math is simplifying the real world ← That's why we need assumptions.

   E.g.1 How can we build a structual model if most factors are endogenous?
   E.g.2 When can we use the method of counterfactual?

3. And assumptions are always not realistic!

   - "application of these assumptions should depend on historical facts" is often easier to say than to do

=> thus sometimes actual situations in history are just too complicated and/or evolved too fast to adopt any models successfully. But in that case would a narrative make things better?

"All models are wrong; Some are useful."

The reading: Introduction

economic growth like the late-medieval European commercial revolution from 11th-14th centries ← **ever-expanding exchange relations** ← enhanced ability to exchange ← **historical institutional developments /institutional evolution**:

e.g.1. merchant courts at 12th&13th: supported impersonal exchange ← by providing incentive for gathering info, honoring agreements, reporting disputes, and adhering to judgments + lowering transaction cost by centralizing certain record-keeping functions and permitting only good standing merchants (Milgrom et al. 1990)

e.,g.2. merchant guild: enabling rulers to commit to the security of alien merchants (← bilateral and uncoordinated multilateral reputation mechanisms failed to overcome commitment problem → cost to ruler of [abusing the rights of "marginal traders"] < [of deterring abuse] ← merchant guild increased this former cost) + coordinating merchants' response to transgression + ensuring solidarity of incentives among merchants (Greif, 1992)

An institution that solve the commitment problem intrinsic in the relationship between principals and agents:
a merchant need to handling of his goods abroad → travel or hiring overseas agents → agents more efficient: save time and risk of traveling + diversification ← but opportunism of embezzling goods (moral hazard/hold-up) → no efficient cooperation

<= institution to overcome: agency relations governed by a coalition:
an individual trader's choice (constrained and supported by) ← [reputation mechanism ← expectations + implicit contractual relations + a specific info-transmission mechanism] | [] = reinforcing + led to entry and exit barriers => ensuring sustainability of the organization

Historical source: geniza: 1000 contracts, price lists, traders' letters, accounts... of 11th trade in the Muslim Mediterranean = Maghribi traders' correspondence
→ not generate hypotheses that can be verified statistically
→ but *employs historical documents to evaluate agents' commitment problem + then use this info to construct an explicit game-theoretical model → recognize the equilibrium strategies ← identified by statements from historical records*

=> captures the essence/nature + generate extended/general predictions ← confronted with historical evidence

1. Background: Commerce, Overseas Agents, and Efficiency

11th century Mediterranean trade was free, private and competitive, with no official restrictions → but with uncertainty: large price variation (as production and communication technologies + commercial relations between different regions around the Mediterranean) + risk in voyage

Maghribi traders: descendants of Jewish trades who left the increasingly politically insecure Baghdad and emigrated to North Africa during 10th century (thus Jewish Muslim) + operated mainly in the west of Mediterranean and invested a lot in merchandise + as time passed they expanded their trade from Spain to Constantinople → uncertainty and complexity of trade → operated through overseas agents who provided many trade-related services → reduce the cost and risk of trade

Agency relations were extremely flexible: merchants operated through several agents at the same time and region + initiating and canceling easily

=> operating/cooperation through agents was efficient and crucial

2. The commitment Problem and Reputation-Based Community Enforcement Mechanism

Commitment Problem in Agency relations:
opportunism due to asymmetric information + unobservable action → a need for supporting institution → ensuring that agent could commit himself ex ante + be honest ex post
→ such an institution existed ← prevalence of agency relation with trust + only a handful of documents about misconduct
← not by legal system → agency relations were not based on legal contracts + court operation were time-consuming and expensive + nonverifiability

To solve the asymmetric information:
Maghribi merchants in different trade centers were associated + reciprocate in the supply of trade-related information and experience → this information flows mitigated information asymmetry and enabled to monitor agent imperfectedly

The theory of repeated games with imperfect monitoring:
by paying agent a wage high enough when honest + making future employment conditional on past conduct → PV of being honest > cheating and facing unemployment
→ agent will be honest ex ante and acquire reputation + merchant know it ex ante and trust
← potential punishment maybe not sufficient → collective punishment
→ only imperfect monitoring gives a probability that a honest agent will be misjudged as cheater

Historical documents reflect how Maghribi traders' repose to suspicions of cheating agent:
1] a reputation mechanism governed agency relations (judging, punishing, enforcing)
\- merchants conditioned future employment on past conduct and practiced community punishment 2] agents were ready to forgive current gain sustain good standing

Question:
Why was coordinated punishment effective and self-enforcing?
=> exact nature of the institution that governed agency relations

3. Model: The Agent Commitment Problem and Multilateral Punishment Strategy

Modeling on actual function of historical institution: assumptions: justifiable by historical evidence + the fewest additional assumptions
→ thus not impose the assumption of the most intuitive explanation for collective punishment : *model based asymmetric information regarding agents' type*: *assuming merchants perceived an agent who cheated to be "bad type" who would keep on cheating in the future if hired (Milgrom&Roberts 1982)*

← 1] no such evidence + no indirect justification that an agent who had proved honest in the past was considered to be more likely to be honest in the future → evidence that suggest merchants were likely to participate in collective punishment even when believing agent was honest
← 2] not justified by historical phenomena: no agency relations with Jewish Italian merchants though very profitable if ignoring agency cost ← agent type model explain by a) imposing strategies contingent on social affiliations or b) unable to verify whether a member of other group ever cheated ← not appealing: a) no Jews discrimination; b) info could be easily verified

=> ~~not a model of repeated reputational model based on agents' types~~ but **efficiency-wage complete-information model of agent's commitment problem** → another mechanism which can support collective punishment and account for other historical phenomena
→ ~~(whatever the importance of asymmetric information regarding agents' type)~~ efficiency-wage complete-information model shows that cp is feasible due to availability of information + cp is self-enforcing due to a link between expectations of future hiring and the stream of rent required to keep an agent honest
**(thus no imperfect monitoring → no capture on asymmetry and imperfectness of information, as well as commercial uncertainty → can be extended)

A Principal agent economy with perfect and complete information in infinite periods:

M merchants: can hire an agent from the unemployed agents in each period, if not hire then receives $\kappa > 0$, if hires then offer a wage W . After each period, they can decide whether to terminate the agent relationship, which could also be terminated due to some exogenous reason with possibility of τ .

A agents: can be hired by only one merchant in each period, after being hired, can decide to be honest and then payoff for the agent and the merchant is $(W, \gamma - W)$, or decide to cheat, and then payoff is $(\alpha, 0)$. An unemployed agent will receive $\bar{w} \geq 0$.

$M > A$, time discount factor δ , $\gamma > \kappa + \bar{w}$, $\gamma > \alpha > \bar{w}$, $\kappa > \gamma - \alpha$

Given the high uncerainty of commerce and life at 11th, the merchant has a limited ability to commit to future wage and employment. And among Maghribi traders, the value of one's reputation did not diminish with old age due to responsibility of his relatives and sons.

A multilateral punishment strategy (MPS)

Merchants' strategy: A merchant offers an agent a wage W^* , rehires the same one if he has been honest (unless forced separation), fires the agent if being cheated, never hires an agent who has ever cheated any merchant, and randomly chooses an unemployed agent if forced separation occurs.

Agents' strategy: being honest if paid W^* , cheating if paid less than W^*

→ Is MPS a subgame-perfect equilibrium?

Assume h_h the probability that an unemployed honest agent will be rehired, and h_c the probability that an unemployed cheater will be rehired

$$V_h = W^* + \delta(1-\tau)V_h + \tau V_h^u$$

$$V_i^u = \delta h_i V_h + \delta(1-h_i)(\bar{w} + V_i^u) \qquad i = h, c$$

Agents' equilibrium strategy: agent will not cheat if $V_h \geq \alpha + V_c^u$ (lifetime expected utility of being honest > one-period gain from cheating + lifetime expected utility of being cheater)

→ $W^* = w(\delta, h_h, h_c, \tau, \bar{w}, \alpha)$, which is monotonically decreasing in δ , h_h , and monotonically increasingly in h_c , τ , $\bar{w}$, α

Merchants' equilibrium strategy: merchant will strictly prefers to hire an honest agent rather than a cheater uner the MPS, since the optimal wage decreases/increases in the probability of future hiring of the honest/cheater
← Under MPS, $W^* = w(\cdot, h_h, h_c) \leq \gamma - \kappa$, where $h_c = 0$, and $h_h = \tau M/[A - (1-\tau)M]$

→ *"It is the uncoodinated response of all the merchants and the interrelations between their expected future behavior optimal wage perceived that insures solidarity of incentives."*
→ *"The possibility of forced separation links the optimal wage from one merchant and the agent's expected future relations with others."*
→ *"Hence, merchants follow the MPS despite the fact that cheating in the past does not indicate that the agent is a "lemon"."*

4. The Maghribi Traders Coalition: Theory and History

The theory and the history leads to hypothesis:
\- Maghribis were governed by a coalition, which is a group of traders whose member merchants are expected to hire only member agents
\- These agency relation are governed by MPS
\- (an agent who cheated a cheater was not subject to MPS)
\- The importance of expectation concerning future hiring in making collective punishment credible
\- Maghribis shared an appropriate internal informal information-transmission mechanism which enables merchants to monitor agents and makes cheating known to all

But question left: no agency relationship with non-Maghribi traders (other Jewish or Muslim)
- agency relationship was limited with only emigrated Maghribi traders in the Muslim world, despite no political restrictions and the perception that trade with Christian world was most profitable = a possibility seems to undermine the foundations of the coalition
→ Why did agents not seek non-Maghribis merchants? Why was the commitment of future employment of honest agents credible despite merchants' temptation to hire non-Maghribi agents? Why then was the coalition sustainable?

The point: *MPS enhances efficiency and profitablility when each merchant has limited ability to commit to future hiring:*
1] bilateral punishment strategy (BPS) would not work in such situations in which the punishment is not credible and thus no trade occur at all given the fact that agents would definitely cheat. Whereas in MPS, an agent takes into account the consequences of cheating a particular mechat in terms of future employment with other merchants. Thus under BPS, $h_c = h_h = \tau M/[A - (1-\tau)M]$, while under MPS, $h_c = 0, h_h = \tau M/[A - (1-\tau)M]$
2] The restriction of agency relations to a specific subset of the group (coliation) leads to a decrease in h_c and an increase in h_h , thus reduces the optimal wage.
3] the wage reduction futher enhances efficiency by making agency relations profitable in situations that gain is low, as $W^* \leq \gamma - \kappa$

=> hence, by affecting efficiency and profitability, the sustainability of a coalition can be assured: member merchants are motivated to establish agency relations with member agents, while the latter are better off being employed by member merchants

Additional point: coalition is self-enforcing

4] if other coalition's merchants will not use MPS against a member agent who cheated anonmember merchant, initiating intercoalition agency relationship will face up to a higher h_c thus a higher w

5] Informal information flows are only availble within a coalition in which each trader is known to others.

6] Outsider's accusations are strategically ignored because they are difficult to be assessed and will make agents vulnerable to blackmail by nonmembers. While an insider merchant puts his own reputation on the line when accusign an agent.

=> expectations of future hiring, the nature of the networks for information transmission, and strategic considerations discourages intercolaition agency relations, making coalition self-enforcing

$\rightarrow$ hence once a coalition is formed through some historical process, relations will be established only among members whose expectations were initially crystallized (path dependency)

$\leftarrow$ however, the boundaries of coalition is determined by the social relations and information transmission networks that promoted by the economic insitution -the coalition itself.

Social structure, social identity and trade coalition:

An institutional path-dependent process + A postitive reinforcement between economic and social insitutions

- Maghribis's immigration process determined the informal social network for information transmission as well as the social idenitity of individuals for collective punishment and future hiring, both of which are the requirements of the emergence of an economic institution -the coalition
- Once coalition was formed, only descendants of Maghribis were perceived by others as members, and membership becomes a valuable asset.
- At the same time, the coalition provided the interactions required to sustain the social structure, while the Maghribis' social identity provided the means to coordinate expectations require for the functioning of the coalition.
- When the Maghribis ceased to operate in long-distance trade and their coalition ceased to function, the motivation for social interactions diminished, their social structure lost its vitality, and the Maghribi traders assimilated into the existing Jewish communities.

But question left: The difference between the Maghribi and the Genoese

- The social structure of the Maghribi traders' group was "horizontal," as traders functioned as agents and merchants at the same time, distinguished with the Italian traders of the late medieval period, whose Agency relations were organized vertically
- The business association employed by the Maghribis required both parties (the merchant and the agent) to invest capital in the commercial venture. In contrast, the Genoese traders established agency relations mainly through commenda contracts, which required only the merchant to invest.

Merchants has the ability and the need to commit while agents do not :
a coalition generated a capital premium for merchants, which is conditional on past conduct, and hence provides a commitment device not available to an agent and future capital premium constitutes a bond that insures honesty → hence it's profitable for each merchant to employ a merchant as agent

if the merchant cheats as an agent, his subsequent relations with member agents will be BPS, thus facing a constrain:

$V_h^a \geq \alpha + V_c^{u,a} - [V_h^m - (R_c + \delta V_c^m)]$ for merchants acting as agents

$V_h^a \geq \alpha + V_c^{u,a}$ for agents

Moreover, a merchant tend to have a high $\bar{w}$ which would lead to hight W^* and preference to agents. Hence within a coalition, the capital a merfhant invests in trade enhances his ability to commit, while the capital invested lesewhre hinders this ability.

In the case of Italian merchants, if its agency relations were governed by BPS, merchants were not able to enhance the ability to commit by investing capital. And Italian merchants were involved in non-trade ventures like real estate, which led to a higher $\bar{w}$ than the Maghribis.

Theory illuminate the rationale behind historical behavior:
History: no explicit legal commitment that governed the length of the Maghribi traders' agency relationship but only informal commitment for a short period of time (like the contract in modern firm) + used a per-venture rather than a multiventure accounting system
← Under a reputation mechanism within a coalition, a short-term contract were more efficient than longer one, since the shorter the contract, the sooner the merchant can discover deviation and the less to pay for keeping agent honest. Similarly per-venture accounting system is more efficient, because it facilitates comparing agents' reports with any relevant information.

5.The Merchants' Law: Coordination and Comprehensive Contracts

operation of a coalition is based on uncoordinated responses of merchants located at different trade centers + Extensive use of incomplete contracts: letters with "Do whatever your best"

→ for the threat of collective punishment to be credible and for the problem of moral hazard, "cheating" must be defined clearly
← hierarchy that require ex ante information transmission is not possible given the communication and transportation technology
← cultural rules of behavior -a Merchants' Law- that specified how an agent should act to be considered honest in circumstances not mentioned and served as a default contract (thus required ex ante learning)

=> Within the coalition, the Merchants' Law promoted efficiency by providing a coordination device, economizing on negotiating cost and enabling flexibility in establishing agency relations.
← However, the Merchants' Law also imposed a rigidity on the system, that did not ensure optimal changes

6. Conclusion

Situation: [asymmetric information, slow communication technology, incomplete contracts, limited legal enforcement]
Institution: coalition = economic institution [information flows, multilateral punishment, expectation, strategic considerations] + social insititution [social relationship, social entity] + Merchants' Law
Result: [wage and capital premium, reducing transaction costs, contract enforceability, coordination, reputation mechanism, efficiency, limited broundary, distortion from maximizing total profit]

The study of the coalition also indicates:
A] the importance of the interrelations between political, social, and economic factors in giving rise to a specific nonmarket institution.
- due to the nature of these interrelations, once a specific institution emerges, it may become a part of a self-enforcing stable system which is not prone to change in response to welfare-enhancing opportunities (Japanese market system?)
→ Hence, economic growth in different economies may be diverse due to distinct institutional frameworks of historical origin

B] the importance of a nonmarket institution in providing the institutional framework required for the operation of the market by influencing the cost of trade and thereby effects the process of market integration (Multinational companies?)

After the reading: 1. Using game theory models to study economic institutions

(中林真幸「近代資本主義の組織」P47-48)

Game theoryに基づく制度の定義はrepetition gameによるものとevolution gameによるものと分けられる (Grief 1998; Aoki 2001)

A] repetition game: sub-game perfect nash equilibriumを制度と見なす. Milgrom(1982), Kandori(1992)らの理論研究が，現実に均衡が生じうる条件を確定してゆき，実証研究に対する参照点を与えて，主にGreifによる，新制度学派の経済史研究が提起した経済発展における制度形成の問題(North,1973, 1990)を内生的に分析する実証研究において確立されてきた
+ 長所：遺されたある一時点の資料から遡って均衡の存在を推定するこ　- 反面：均衡の存在を推理するための合理的な推論が経済主体においても可能であったことが前提となる

B] evolution game: 制度形成の過程として，経済主体の慣習が，第三者執行や明示的な設計に依拠することなく，経済主体の行動の累積によって形成される
+ 長所： 慣習と信念が限定された合理性の下で，逐次的に形成する過程(Aoki, 2001)を分析の仕組みに組み込んだことにより，合理性を仮定することなく均衡への到達を分析しうる(Matsui 1996, Kandori 1997), より現実に忠実に記述　- 反面：各時点にあり得た制度と信念の複数均衡と共進を実証的に推定することは困難

=> 事実を発見し，帰納的な論証によって定型化された事実を確定することを重要な営みとする経済史学にとって，実証研究における参照の枠組みとしては，reptition gameにおけるsub-game perfect nash equilibriumを制度と見なして，その存在を証明することが便利

After the reading: 2. The review by Gregory Clark

A Review of Avner Greif's Institutions and the Path to the Modern Economy: Lessons from Medieval Trade -Gregory Clark - Journal of Economic Literature, 2007

> Greif defines an institution as a self-reinforcing set of behaviors. Greif pioneered in applying game theory to historical institutional analysis ... grounded the explanation of informal institutions in optimizing individual rational behavior. Behaviors that would seem to the layman to be based on blind irrational custom could be shown to be consistent with individual optimization.Given the incredible intellectual elaboration of game theory, and its meager harvest in terms of actual economic applications, the finding was welcome to both game theorists and to economic historians. The Maghribi study also allowed for the possibilities of institutional change resulting just from changes in parameters. Since the equilibrium depended on certain parameter values, changes in transportation costs or observability could terminate the old equilibrium and lead to a new one. The 1993 article seemed to point to new micro foundations for institutions that would ground them in individual maximizing behavior.

> But this book is almost certainly not what many economists who welcomed the 1993 article expected...In a search for generality, Greif concludes that such a set of limited rational actor assumptions is not constraining enough to describe real-world institutions. For a start, “multiple equilibria usually exist in the repeated situations central to institutional analysis”. There have to be more constraints on the structure of the interaction to explain the equilibrium. These constraints include “cognitive norms” as well as “the social and normative foundation of behavior”. Issues such as “losses of esteem,” “norms,” “fairness,” or “social exchange” have to be introduced. Also such social and normative behavior is “situationally contingent”.

> Once we are compelled to admit [those]...we lose all explanatory power... [Greif] does not seem to appreciate the price of this generality in terms of testability. All we are left with is the idea that people operating within institutions act as they do because, given the cognitive, intellectual, cultural, and normative constraints they face, their actions seem to them as being the best available. But, in an informal sense, we knew that already. Without any consideration of the ins and outs of game theory, we can appreciate that any lasting institution likely constitutes some set of self-reinforcing behaviors...So what insights have we gained from page after page of elaboration on the idea of equilibria and the elements that enter into them?