

Notes on Institutions and Economic Development

1. Institutions affect economic development and economic development affects institutions
 - a. if there were no differences in institutions, then development would just be regular economics on poorer countries¹
 - b. North has posed the key question as “why institutions that produce poor economic (and political) performance can emerge and persist” (North 1993: 12).
 - i. this gets at the issue that institutions may not be the result of design, and that inefficient institutions may persist, which could be one explanation of why countries do not develop.
 - c.
2. Hall and Jones (1998) show that cross-country productivity differences, measured in levels, are large, and cannot be explained by differences in input use, both physical and human.
 - a. Let output be produced according to Cobb-Douglas:

$$Y_i = K_i^\alpha (A_i H_i)^{1-\alpha} \quad (1)$$

where H_i is the amount of human capital-augmented labor used in production, and A_i is a labor-augmenting measure of productivity. The former is given by $H_i = e^{\phi(E_i)} L_i$, where ϕ can be thought of as the returns to schooling. We can re-write (1) in terms of output per worker:

$$y_i = \left(\frac{K_i}{Y_i} \right)^{\frac{\alpha}{(1-\alpha)}} h_i A_i \quad (2)$$

and (2) can be estimated cross-country.

- b. When you do this, differences in productivity levels explain far more than differences in capital-output ratios or human capital. Arithmetically, this is due to the fact that capital-output ratios do not differ as much, cross-country, as to per-capita incomes. For example, average investment rates in the five richest OECD countries are only 2.9 times as high as the five poorest countries in Heston-Summers. But per-capita incomes differed by a factor of 32!
- c. The Hall-Jones notion is that *social infrastructure* (institutions and government policies that provide incentives for individuals and firms in an economy), is the primary fundamental determinant of these differences.
 - i. Incentives, in particular, to engage in accumulation of skills and innovation, or to engage in predatory behavior or protection there-from.
 - (1) social control of diversion has two benefits
 - (a) agents obtain the full benefits from their activities
 - (b) resources are not invested in protecting against predation
- d. Social control of diversion has two benefits

¹There is now a huge development in the literature on institutions. Economists study the role of institutions in growth, the role of corruption, and many other organizational features.

- i. a society with little diversion implies that productive units are rewarded by the full amount of their production; in effect, tax wedges (created by diversion) are lower
- ii. a society with lots of diversion encourages agents to invest resources in avoiding diversion
- e. social infrastructure, often through the state, reduces diversion via teaching that stealing is wrong and via punishment when it occurs
 - i. these points typically lead to models with multiple equilibria
 - (1) when there is low diversion output is high and the high probability of punishment deters diversion
 - (2) in the low-level equilibrium, income is low because diversion is high and the probability of punishment is low
 - ii. in many cases diversion takes the form of rent-seeking
 - (1) good social infrastructure will limit the leaks through which this occurs, and will induce agents to spend more time on productive activities, as opposed to rent-seeking
 - (2) hence, the more transparent are markets, and the less the intervention, the smaller are the possibilities for rent-seeking
- f. Econometric Model
 - i. the following structural model forms the basis for estimation

$$\begin{aligned}
 y &= \alpha + \beta S + \epsilon \\
 S &= \gamma + \delta y + X\theta + \eta
 \end{aligned}
 \tag{3}$$

where y is the log of per-capita output, S is social infrastructure (to be measured), X is a collection of other variables.

- (1) notice that S is endogenous. Clearly the level of y affects the level of social infrastructure.
- (2) Poor countries could have less resources with which to punish diversion, for example, and they could thus utilize policies that are more conducive to diversion.
- (3) there may be many ways in which S is determined. Hall and Jones do not estimate the second equation in (1). Rather they assume that all the determinants of S that affect y do so solely via S . This is a strong assumption; they test it
- (4) to identify the model they assume that $EX'\epsilon = 0$. This means that any subset of determinants of S can be used as instruments in the first equation. This means that they do not need to have a full list of all determinants of S to estimate the first equation in (1).
- g. A problem is that S is not directly observed; two proxies are used (averaged together in the baseline estimation)
 - i. a Mauro-like index that rates countries based on the ability to protect against diversion; e.g., country-risk index
 - ii. Sachs-Warner index of openness to trade
 - (1) the idea is that the longer you are open to trade have fewer rent-seeking opportunities
- h. what are proper instruments?
 - i. correlates of western European influence; the idea here is that rule of law spreads from contact with western cultures;
 - (1) this ought to be exogenous if western expansion was not caused by factors which make countries rich;
 - (2) of course, western expansion was fueled by natural resources, but this does not explain much, if any, contemporary variation in y
 - (3) most countries colonized had sparse populations suggesting that these regions were not particularly productive given 15th century technologies; so there is no reason to think that

- they had other reasons to grow fast and accumulate S
- ii. two proxies
 - (1) use of language: English, Portuguese, Spanish, French, German
 - (2) distance from equator
 - (a) the idea is that western countries colonized first countries farther from the equator
 - (i) this is measured by distance from the equator of the center of the country (measured by the most populous county: so LA is the center of US).
 - i. Results
 - i. Basic result is a strong correlation between S and y . The estimate of β is 5.14 with a standard error of 0.508
 - (1) to assess this it is important to distinguish between measurement error in the proxy for social infrastructure \tilde{S} and actual cross-country variation in true S
 - (2) if there is no correlation between \tilde{S} and the error term (no simultaneity), then the standard deviation of S can be estimated by:

$$plim \left(\frac{\hat{\beta}_{OLS}}{\hat{\beta}_{IV}} \right)^{\frac{1}{2}} = \frac{\sigma_S}{\sigma_{\tilde{S}}} \quad (4)$$

- (a) from their estimates this gives .800 for the ratio of standard deviations
 - (3) if there is simultaneity then there will be a larger standard deviation of the measurement error; they argue that the lower bound on the R^2 correlation is .5. This gives a lower bound on the ratio of standard errors of $(.5)^2 = .707$
 - ii. in the data \tilde{S} ranges from 0.113 in Zaire to 1.0 in Switzerland. Given that $\hat{\beta}_{IV}=5.14$, this suggests a variation in output levels of $e^{5.14*(1.0 - .1127)} = 95.65$, which is implausibly high; but this assumes no measurement error
 - (1) using the bounds .707 to .800 on measurement error, yields estimates:

$$e^{0.707*5.14(1.0 - .1127)} = 25.13$$

$$e^{0.807*5.14(1.0 - .1127)} = 38.4$$

- which are sensible bounds given the estimates of level differences. The US has per-capita income 35 times higher than Niger.
- j. The conclusion from this analysis is that differences in S appear to explain a large amount of the variation of y across countries
 - k. the question is how to *endogenize* institutions, so that we can explain how they evolve in the development process
 - i. two approaches emerge
 - (1) transaction cost approach is effective in explaining the *demand* for alternative institutional arrangements; in this approach we see institutions developing to reduce the transactions costs agents face
 - (2) collective action approach is effective in explaining the *supply* of institutions; the free rider problem is the barrier to the emergence of institutions; to be effective they must overcome this barrier

3. What are institutions?
 - a. institutions are defined as a set of humanly devised behavioral rules that govern and shape the interactions of human beings, in part by helping them to form expectations of what other people will do
 - i. thus they can be formal, like laws, constitutions, contracts, or norms, customs, shared values, ideology
 - (1) one interpretation of the development process is that entails the transformation of these institutions from informal to formal
 - ii. for this to be useful it must be clear to whom the rules apply
 - iii. it is useful to distinguish institutional *arrangements* from institutional *structure*
 - (1) the former govern behavior in a specified domain, such as sharecropping or fixed rent; the latter refers to the whole environment; e.g., a planned economy
 - (2) A good example of institutional arrangements would be the means of contract enforcement developed by traders when legal sanctions were not available
 - (a) e.g., Maghribi traders, champagne fairs, “community labels”
 - (i) the latter two institutions required organized mechanisms to collect information to make them work; without this information a community member could benefit by making false accusations that would harm the rest of his community
 - b. the *function* of institutions is to help agents or groups of agents to improve welfare, but there are often many institutions that can serve the same function
 - i. which institution arose may depend on various factors such as:
 - (1) power relations
 - (2) information structures
 - (a) when moral hazard or adverse selection opportunities are widespread insurance may not work; also when risks cannot be diversified
 - (b) for example, in rural settings it may be hard to distinguish between various causes of production shortfalls
 - 1) direct effect of bad weather
 - 2) indirect effect of bad weather via health effects and labor supply
 - 3) producer mistakes in resource allocation
 - 4) shirking
 - (i) hence, institutions like inter-village marriage and remittance from migrants may develop to reduce risk
 - (3) legal environment
 - (a) property rights are obviously a key economic institution, but the effectiveness of property rights depends on the nature of the legal system, since these rights are meaningless if not enforced
 - (b) this argument also extends to contracts, although in that case there are self-enforcing institutions that may apply
 - (4) historical accident; path dependence
 - c. *interdependence of institutions*
 - i. a key insight of the literature is the importance of interdependence among institutions in modern corporations managers can take advantage of information rents through opportunism; this weakens the corporate form of governance, via opportunism; but the presence of a market for corporate control can mitigate opportunism
 - (1) the role of the financial system in legal judgement in Russia
 - (2) collective farming (Lin, JPE, 1990); the key problem facing collective farms is shirking by workers, hence the advantage of household farming; but collective farms pool risks better

and can exploit economies of scale

- (a) there is an incentive problem in collective farms because of the cost of monitoring effort; if there were perfect monitoring then the collective farm is superior to the household because of the complementarity of effort; but if monitoring is costly, then agents will shirk, and the household is better
- (b) hence if collective farms can be supported by self-enforcing contracts that eliminate shirking they would have an advantage
- (c) what would these self-enforcing contracts look like?
 - (i) they would give the right of an agent to withdraw (exit) if others fail to live up to their obligations²
 - 1) notice that for this to work it must be a repeated game; self-enforcing contracts are infeasible in one shot games
 - (ii) the potential shirker must trade off the current gains from free riding against the discounted losses that would result (from loss of economies of scale) if the collective collapses; this can occur precisely because of exit (notice also that the most productive will leave first, and this will hasten the collapse of the collective farm).³
 - 1) it is the threat of the collective's collapse that deters shirking
 - 2) this means that production will be at least as great on the collective as if they were all households
- (d) when exit is eliminated as an option, the punishment of shirkers via collapse of the cooperative is eliminated; now monitoring is crucial, and if this is costly, productivity will collapse
- (e) in Chinese collective farms prior to 1958, the right of exit was enforced; exit was then removed in the Great Leap, and China did not achieve its 1957 level of grain production until the mid 1960's.
- (f) look at the graph of TFP in Chinese agriculture; there are four phases; pre-58, 58-62, 62-77, and 78-87, and notice that TFP rose in the first and the last
 - (i) if the collapse of agriculture was solely to the extremes of the Great Leap and bad weather, how to explain the third period?
 - (ii) notice that TFP rises with collectives that are voluntary in the first, and even more with HRS;⁴ of course technology is improving all this time and so there are good reasons for improvement in the HRS⁵
- (3) limitations on the ability to penalize for breach can impinge on certain institutions
 - (a) inability to dismiss workers leads to less training
 - (b) inability to obtain collateral (or to collect it) leads to less loan contracts
 - (i) here the absence of property rights and the legal system is crucial
 - 1) the financial system can also be a problem in collecting collateral, if it forces

²Notice the resemblance to the literature on rules versus discretion.

³This means that for a collectivized system to survive some collectives must collapse so that the cost to shirking is apparent. If the political leadership eliminates collapse of collectives then incentives collapse.

⁴Some of the gain in TFP is due to the end of the self-sufficiency restriction in 1978, but estimates of the magnitude of this are small compared to the total improvement.

⁵It is also interesting to note that the emergence of the HRS fits with these hypotheses, in that the emergence of the system was fastest in provinces where the costs of breaking up collectives were lower (less machinery) and where the costs of monitoring were higher (greater share of crop to animal husbandry).

- transactions underground
- (c) credible commitments, via constitutional arrangement, not to repudiate debt can lead to big improvements in the fiscal system and savings
- ii. the interdependence of institutions creates the prime methodological flaw of the new institutional economics; the difficulty in empirically isolating the role of a given institution
- 4. Institutional evolution
- a. institutions evolve as the underlying fundamentals that conditioned their development change
- i. if agriculture techniques are simple and if most exchange is very local, then village organization may be all that is needed to support exchange and deter opportunism
- ii. as production techniques evolve the existing institutions may no longer be optimal
- (1) this does not mean that they will necessarily evolve in an efficient manner
- (a) the costs may not be symmetrically distributed, and the power structure may prevent adaptation
- (b) or there may not be sufficient individual interest to counter the system (castes in India); free rider problems
- (c) efficient adaptations may be repressed by governments
- b. if we start from an *institutional equilibrium*, we can think of three sources of shocks that can lead to change
- (1) changes in the demand for institutional services
- (2) changes in the technologies related to transactions costs
- (3) changes in the choice set of feasible institutional arrangements
- i. changes in the demand for institutional services
- (1) the most important source of shifts in demand for institutional services is changes in relative factor supplies; the most notable example here is the Black Death
- (a) a key part of the development process is the transition from a situation of abundant land and scarce labor to one where land is scarce and labor is abundant
- (i) this leads to declines in serfdom and increasing importance of property rights in land⁶
- (b) the discovery of oil in the North Sea led to the development of property rights on minerals in the oceans, where none existed before
- (2) another source of shift in demand for institutions comes from changes in other institutions, due to *interdependence*
- (a) in primitive societies honor is often a substitute for a legal system
- (i) honor induces people to cooperate and trust in the absence of formal laws
- (b) similarly, patron-client relationships are prevalent in pre-industrial societies; they reduce aggregate transactions costs by reducing the need for specialized markets (land, labor, capital)
- (i) once markets start to develop, these relationships become redundant and costly
- (3) demands for institutional change may also arise from changes in production technology
- (a) cotton production in the Delta is a good example
- (b) perhaps the development of the M-form is relevant here
- (i) or this could be due to changes in finance: as the financial system develops owners and managers are separated, so the organization of the firm must develop
- (c) just-in-time

⁶The brief resurgence of serfdom after the Black Death is relevant here. It was precisely the greater abundance of land in the Russian frontier that preserved serfdom longer in Russia than the rest of Europe.

- (d) the O-ring theory
- c. Exogenous changes in transactions costs
 - i. political change and war can exogenously change transaction costs
 - (1) the changes in the EEFSU are clearly one example
 - (2) an interesting example is the dynamics of property rights in Europe from Rome to thru the Middle Ages
 - (a) in Rome law and order prevailed, so it was low cost to enforce contracts; trade flourished; markets developed, and property rights had meaning
 - (b) as Rome declined, order vanished so trade was more costly; this led to feudalism; specialization declined and the manorial lord became an important protector of order
 - (i) notice that because the decline of Rome meant that property rights could not be enforced, agriculture moved from private property to the open-field, scattered strip system; in this system land was shared, protected by the lord
 - (c) trade returned as the legal order returned;⁷ first via fairs where merchant could cluster and jointly protect themselves; as markets became thicker they became more regular
 - (i) this is associated with the development of the state; if the sovereign could protect property rights, trade would rise and taxable income would be higher
 - ii. When the rules of the game change the equilibrium that will be played changes; but often the new equilibrium will be related to the beliefs that were supported by the previous equilibrium; in other words, *cultural beliefs*
 - (1) the key point here is that the equilibrium of the new game is related to that of the previous game, something that is not common in game theory; but this seems to occur
 - (a) Greif suggests the outcome of the (exogenous) expansion of trade in the late medieval period with regard to the Genoese and Maghribis. Their relative response to new trade opportunities was linked to their play in prior games
 - (b) this adds an element of path dependence to institutions
 - (i) a suggestive example is the prevalence of evasion in post-Soviet Russia, an inheritance from the legacy of information concealment under planning
 - (c) cultural beliefs may provide the initial conditions in a dynamic adjustment process through which a new equilibrium is reached following the change in the rules of the game
 - (2) once an organization is established it can impact on subsequent developments
 - (a) An example would be the impact of the state-run post office in Ireland in the 19th century. This led to the widespread distribution of state bonds, which, in turn, undermined Irish efforts to create agricultural cooperatives, unlike the case in Germany.
 - (3) this may help to explain why it takes time for institutions to adapt to changes in the environment
 - (a) in a game-theoretic setting, a change in the extensive form should change the equilibrium of the game instantly, but in practice these changes often take a long time
 - (i) this may be because expectations are historically dependent; this would be especially important in settings with multiple equilibria (coordination games)
 - (ii) it is also due to bounded rationality which limits the ability to fully comprehend the strategic possibilities inherent in a specific situation

⁷This is opposite to the Pirenne thesis whereby trade restored by the political changes of the decline of the Saracens, combined with the emergence of opportunities.

- (iii) the work on the emergence of norms is important here
- (b) it is important to recognize that a whole range of factors -- social, political, cultural -- may affect equilibrium selection, not just economic efficiency
 - (i) this would not be important if equilibria are unique, but with multiple equilibria this is important
 - (c) the literature on the emergence of conventions is relevant here
- 5. what this all suggests is that adopting (what appear to be efficient) institutions that are successful in one society may be problematic in different societies
 - a. One view of economic development is that it studies why some societies fail to adopt the institutions of more economically and politically successful societies
 - i. after all, if poor countries could just adopt the institutions of the rich ones, then there would be little to study; LDC's would just be small DC's
 - b. if institutions are organizations plus expectations, it is critical that the expectations (beliefs) be appropriate in the adopter society. This, of course, depends on history, because of the importance of cultural beliefs. Hence, to answer this question it is critical that we understand the conditions that make the institutions successful; in particular, we need to understand what collateral institutions are necessary to support them