Contemporary Theories of Economic Development

- These notes cover some more recent theories of economic growth and development.
- We look at departures from the neoclassical framework of unique equilibrium and perfectly functioning markets.

1. Underdevelopment as coordination failure

- Emphasis on **complementarities** between various conditions necessary for successful development
- **Complementarity**: when an action taken by one firm or individual increases the incentives of (makes it more profitable or less costly for) other economic agents to take similar actions (this action does not have to be a good thing!)
- **Examples**: corruption, not throwing garbage on the street; using Windows, QWERTY, etc. Ask students for more examples!

  * complementarities involve **positive externalities** across agents (the more I do something, the cheaper for you is to do the same; the more people do something, the cheaper/better for others to do the same).

  * can create **status quo bias** – being stuck in a possibly bad situation (e.g. most people using Windows today because DOS was very successful early on). Very hard to make people switch.

  * In contrast, when we have **negative externalities** (e.g. congestion), doing more of something makes it harder/more expensive to do the same (e.g. traffic on two bridges) – everyone wants to do the opposite (not the same) action (e.g. take the other bridge).

2. Coordination failure: a state of affairs in which agents’ inability to coordinate their behavior (choices) leads to a stable outcome (equilibrium) in which they are all worse off than in an alternative situation (also equilibrium).

- it may happen even when all agents are **fully aware** the other equilibrium exists, it is just **individually suboptimal** to deviate from the current ‘bad’ equilibrium (example with corruption; entering the train before people get off);
- each individual agent is better off to wait someone else to make the first move.
- Thus, the only way is a **coordinated switch** to new equilibrium (e.g. driving direction change in Sweden). But this is very hard to do.

3. Applications to development:

  * complementarities often involve **investments whose return depends on other investments being made by other agents** (‘network effects/externalities’)

  * complementarities involve **positive externalities** across agents (the more I do something, the cheaper for you is to do the same; the more people do something, the cheaper/better for others to do the same).
Example 1: presence of firms using specialized skills and the availability of workers with those skills (firms will not move into area without such skills, workers in an area won’t acquire skills if not sure they’ll be employed)

the above coordination problem can leave the economy in a bad equilibrium (no skilled workers and no highly productive firms) vs. having both – another equilibrium.

basically, A CHICKEN AND EGG problem – what comes first? The skills or the demand for skills? Most often, both can happen at the same time.

Example 2: similar problems may be present in early industrialization (who adopts modern technology first? – Rosenstein-Rodan’s ‘big-push’ model – see next notes) and can be further compounded by market failures (e.g., in capital markets).

Example 3: modernization of agriculture – a farmer will specialize in a crop (more efficient and productive than each farmer growing everything) only if he is sure can trade it for another crop – requires good access to markets; contract enforcement, quality control (a middleman), etc. Again: one, ‘bad’ equilibrium is everyone in subsistence agriculture; another, ‘good’ is specialization in crops and trade.

Especially problematic if there’s a lag between making an investment and realizing the return on it.
THE “BIG PUSH” MODEL of Rosenstein-Rodan (RR)

* perhaps the most famous model of coordination failure as an obstacle for development. BUT don’t take it literally!

*RR asks how does a country industrialize? If a single firm (‘shoe factory’ in his original example) adopts modern technology and everyone in the country is very poor, who’ll buy the goods? Even if the firm pays its workers well, they can’t be sufficient to support the demand for the modern goods…The single modernizing firm will be making a loss.

* but if another firm, in a different sector (e.g. clothes) also modernizes then each firm creates demand for the other firm’s product; so if enough firms modernize at the same time, those spillovers may be enough to make them all profitable!

* the coordination problem arises because no single firm wants to modernize first and suffer losses; only if all (or sufficiently many) coordinate and modernize simultaneously, will all make profits.

* RR thus suggests that a “big push” industrialization policy that modernizes all sectors at the same time would make everyone better off.

THE RR MODEL FORMALLY:
Assumptions:
A1. there exists only one factor of production: labor; fixed total supply L

A2. there are two methods of production: ‘modernized’ and ‘traditional’. Workers using the traditional method are paid wage 1; workers in firms using the modern method get paid W > 1 (like in the Lewis’ model) Why? (e.g. to compensate for disutility in living in city, etc.). Not crucial, for simplicity.

A3. technology: there exist N products (N is large). In the traditional sector (for any of the N products), 1 worker produces 1 unit (CRS, linear production). In the modern sector (for the same N products), there are IRS. No product can be produced, unless a minimum of F>1 workers are employed (fixed cost, you need to pay; proxy for capital/machines not in the model). After that linear: total labor requirements are then \( L_D = F + cQ \) where \( c < 1 \) (modern sector labor is more productive than the traditional sector, after hiring the F workers, less than 1 worker is needed to produce 1 unit of output). You can think of F also as the number of workers needed to build/maintain the modern factory.

A4. demand: each good receives the same share of consumption. If national income is Y, consumers spend \( Y/N \) on each of the N sector goods.

A5. closed economy (for simplicity). Why is it important? If the first modern sector could export to rich customers abroad – no need to wait for other sectors to develop and create demand for its product.
A6. market structure: perfect competition in the traditional sector (free entry, zero economic profits); price of each good is thus 1 (the MPL); However, a monopolist firm in each of the N modern product sectors. Price is still 1 though because customers can always buy from the T sector.

**Multiple equilibria? (fig. 4.2)**

* Suppose we start in a fully traditional economy. A potential producer with modern technology in one of the N goods thinks whether it is worth entering the market.

* see Figure 4.2: the production f-n for a T (= traditional) firm is linear, slope 1 in labor; The prod. f-n for M (= modern) firm produces 0 for L<F and then has slope > 1.
* point A at Q1 (low) corresponds to the demand if only 1 M firm operates. Point B at Q2 (higher) corresponds to the demand for a firm’s product if all modernize.
* wage bill: for the T firm since wage =1 coincides with the prod. f-n line; for the M firm is the W line with slope W > 1.

Suppose W=W1 (low modern wage); Then for the M firm profit (oQ2BL/N) > cost (the wage bill) and it will pay F and enter even if no one else does. All is symmetric, so in all N sectors M firms enter and the economy modernizes. A unique equilibrium.

Suppose now W = W2. If a firm is alone to modernize – incurs losses since at A the wage bill exceeds revenues. But if all modernize – go to B and then it is profitable to operate. So two equilibria: one where no one enters M; and one that all enter. But latter needs coordination to achieve – no one would like to enter alone; needs promise that others will follow.

Finally, at W = W3 (high modern wage) the M wage is too high so even if all enter they make a loss. The unique equilibrium is no one modernizing.

*NOTE: the market alone cannot get us to point B (where all firms are modernized) because of the coordination failure. All firms using traditional technology is an equilibrium for W = W2! There it is in no one’s interest to deviate alone.

* don’t take this literally – not necessarily all sectors need to modernize – generally, a sufficient number if enough (to create sufficient additional demand).

* there could be also technological externalities across sectors (e.g. advances in one make it cheaper to produce in another) which could exacerbate the complementarity.

**Problems with the “big push” model**

- May be “too expensive” – requires massive investment – country may not be able to do it
- Requires to allocate investment in the right proportion of expenditure (in the model was 1/N but in reality will be more complicated) – too hard information requirements.
- What determines which equilibrium a country is at? Role of ‘luck’, ‘expectations’, a bit unsatisfactory theory of underdevelopment…
- How to test such theories with data? No theoretical prediction for which equilibrium will prevail. Two countries with same conditions may end up in two very different equilibria. Need to test indirectly, e.g., test for complementarities.
Why not solve the coordination failure by a ‘super-entrepreneur’ (or the government)?
* one entrepreneur entering all markets and no need to coordinate then? Very tempting to have a top-down ‘planner’ who resolves all these coordination problems.

* but there are problems:
  1. there may be capital market imperfections (very expensive to gather necessary capital; logistics; how could a penalty for default be imposed?)
  2. agency costs – will be impossible to monitor, give proper incentives as the firm gets too large (asymmetric information: moral hazard (unobserved actions) or adverse selection (unobserved characteristics) or people/ sub-units.
  3. communication failures – who’ll play the coordinator role? Many people/firms will want it, how do you trust them, how do they make you believe? How do they commit to follow up on their promises?
  4. limits to knowledge/information: coordination of the whole economy requires huge information and processing it in real time – impossible to ‘read people’s minds’. In contrast, the (decentralized) competitive markets capture all preferences and costs characteristics in market prices (no need to extract more information). Case in point: the Soviet Union’s economic failure.

4. ROLE FOR POLICY in models of coordination failure?
* in the above context policies could to be viewed as a device for moving the economy out of one equilibrium into another

* A role for government to coordinate? In theory seems yes… In practice however the government itself may prevent coordination (e.g. a dictator clinging to power).

* in the ideal case, if the government has all the required information, only a deep intervention will work; one that manages to dislodge the economy from the bad equilibrium (where, by definition, it is individually optimal for each agent to stay) and “push” it towards a better equilibrium.

* after the deep intervention, there is no need to continue the intervention policy; a one-off “push” will do. Why? A policy need not be persistent – precisely because the desired end-state is also an equilibrium – just need to push the economy to start “rolling” towards it. The policy may be removed immediately after old equilibrium is ruled out

* Policy implementation and timing must be smartly chosen – e.g. compulsory primary education – its benefits are unclear in a society where labor power is needed for current output and where no one else is particularly educated. Thus a country may commit lots of resources to schools but children may not be sent to them by parents – may lead to worse outcome than the initial one.

* the role of information/communication is crucial to achieve coordination. However, there can be a commitment problem too (especially if time lag exists to reaping the returns) – do I ‘plunge in’ now on the ‘promise’ others will follow? Role of expectations is key.
* **role of norms:** when there are multiple equilibria, norms, ‘culture’ or traditions can serve as coordination device to achieve a good (or bad) equilibrium. E.g. a culture of mistrust would likely lead bad outcomes with everyone trying to cheat and not be cheated. Opposite in a culture/norm of trusting strangers. But again, how does one switch?

* **reading:** ‘punctuality’ vs. lateness equilibria in Box 4.1 in the TS textbook (individually optimal to also show up late if know the other(s) will show up late) (Equador; Basu and Weibull); government tried a campaign against lateness to try to switch.
Figure 4.2 The Big Push