

# Economic Growth

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## What is this course about?

There are sizeable differences in income-levels across nations. The per capita income in Hong Kong, for instance, is a hundred folds greater than that in Malawi. Growth rates too vary, and considerably so. Take the half century between 1960 and 2010. During this period, income in China grew by a factor of fifty, while income in Burundi, Haiti, and Nicaragua exhibited little change. This course is a gentle introduction to the forces that shape levels and rate of growths of income across nations. Put differently, we intend to get to root of why some nations are poor and others rich. Note that this course is concerned with theoretical questions, whose answers (presumably) shed light on the nature of economic growth across a wide variety of national and cultural regions. We do not concern ourselves with the specifics of the growth story of particular countries, except in so far as the specifics shed light on larger theoretical questions.

## My view of economic growth

I see economic growth as a rough process in which firms, even whole industries disappear, only to have their places taken by others. These changes emerge from people trying to do 'better for themselves', in the course of which they seek new jobs, create new firms, and find new homes. A growing economy seethes with change at the micro-level, even when macro aggregates like GDP reflect some degree of steadiness. In fact, both the steady and unsteady movement of macro aggregates emerge from perennial turbulence at the micro-level. Economic growth, therefore, is not the story of people bettering their lives by steadily accumulating capital and knowledge. Economic growth is a story of change, turbulent change, and not merely one in which people change the way they live their lives but one in which they create

new selves.

## **Structure of the course**

The course is organized into twelve distinct yet related modules, each of which emphasizes a particular theme pertaining to the wealth of nations. In Module 1, we explore some stylized facts about economic growth, all the while noting the difficulties associated with measuring economic growth. These facts are the 'macro' or 'aggregate' realities which all growth theories must explain irrespective of how different they are with respect to their presumptions about micro behavior. In Modules 2 and 3, we develop a sense of two structures through which individuals interact with each other in pursuing their economic goals, the first of which is 'markets' and the second 'governments'. Note that both these structures involve the pursuit of self-interest, rivalrous competition, scarcity of resources, signalling, advertising, and coalition formation. There are however considerable differences too, with the primary difference being the use of the price-system in markets and the voting-mechanism in governments. In so far as most economies involve some combination of market-driven and government-driven activity, the prosperity of a nation will depend on how these two arrangements shape economic affairs. Understanding markets and governments therefore is vital to making sense of why some nations are rich and others poor.

In Modules 4 and 5, we begin our investigation into the causes of economic growth with an analysis of specialization and exchange. Specialization is the division of a task among many individuals with each performing some bit of the task instead of the whole. Under certain sufficiently general circumstances, specialization increases productivity. And these increases in productivity can be self-propelling in the sense that the increases in productivity of one firm or one industry is capable of increasing productivity in another.

Module 6 studies self-propelling growth from another window, i.e. from the window of how capital goods are created and used for the production of consumer goods. Economic growth involves the transition from fishing with one's barehands to building a net and then using the net to fish. And the period during which the net is knit may involve a decrease in the consumption of fish because one cannot spend as much time fishing with one's barehands. One factor which influences the creation of capital goods and therefore economic growth is the extent to which individuals are

willing to forgo present consumption for an increase in future consumption.

Note that Modules 4, 5, and 6 present forces of change, which are ultimately forces of disturbances to the economic system as a whole. An increase in the specialization in one industry, or an increase in the roundaboutness of a certain process of production, alters the relative scarcity of different goods and thereby disturbs the plans of many agents in the economy. The price mechanism by signalling these changes in relative scarcities re-coordinates the economy. Put differently, economic growth come about because of the conjoint workings of the forces of change and the forces of stability, with the price mechanism being the principle stabilizing force in a modern economic system. In Module 7, we examine the role of the price mechanism is engendering a modicum of order within a system which experiences perennial change from within.

In Module 8, we study the relationship between population growth, knowledge growth, and increases in per capita income. We note the fact that knowledge has a non-rival quality to it, for instance, the technological knowledge created one individual can be used by another without reducing the quantity of knowledge available to a third. Therefore, higher population can potentially create more per capita income simply by there being more brains at work. The problem of economic growth is at the bottom of it all the problem of how large numbers of brains work together, and not the problem of resource allocation. For ultimately, sterile objects become 'resources' only when people create ways in which they can be used to satisfy the wants of others. Crude oil was odious nuisance, not resource, before the era of petroleum refineries. People's ability to think, to imagine, is therefore the ultimate resource.

In Modules 9 and 10, we explore the question of institutions, put differently, the problem of how the rules of the economic game shapes economic behavior, which in turn shapes outcomes. One of the most significant ways in which institutions influence economic growth is by influencing the allocation of entrepreneurial talents between productive and destructive uses. Before making sense of how institutions shape entrepreneurship, note that economic entrepreneurship involves not only the creation of new goods and new production processes, but also the discovery—more aptly, the 'creation'—of new markets. The creation of new goods and production processes contribute to economic progress in a visible but narrow sense. The creation of new markets in contrast infuses powerful currents of growth across the system,

currents whose ultimate effects are the creation of new goods and processes far from the where the currents originated. New goods, new processes, and new markets are all forms of growth promoting entrepreneurship. The entrepreneurial act however need not necessarily be growth promoting, in fact, in some societies a sizeable share of the entrepreneurial talent is directed towards growth retarding activities like bribing government officials for work orders and licenses. The division of entrepreneurship between growth-promoting and growth-retarding activities depends on the payoffs associated with each, which in turn depends on the rules of the economic game.

In Module 11, we delve into the complex question of how people's beliefs about themselves and others, put differently their 'ways of life', co-evolves with granular processes that generate economic growth. The process of specialization and exchange shifts people from the collective village of their clans to anonymous cities in which people are tied together by little more than their common efforts to 'create a better life for themselves'. This process naturally limits the transmission of traditional beliefs, which are inevitably substituted with beliefs more suitable to living with 'strangers', one goes from being tribal to being civil (the pejorative tone of the word 'tribal' and the elevated tone of the word 'civil' is itself an outgrowth of the process of economic growth).

In Module 12, we document the relationship between economic growth and environmental pollution. The United States and Western Europe generated considerable environmental pollution in the early decades of economic growth. In more recent decades however these regions have experienced a decline in environmental pollution within their national boundaries. There are numerous theories which attempt to explain this pattern, though none appears wholly convincing in and of itself. Furthermore, it remains unclear as to whether and how present low-income countries can transition to reducing environmental pollution. The problem of pollution is important because it generates sizeable reductions in wellbeing through disease and death.

## **The flood and drought of reference materials**

I have struggled with stringing together reference material for this course, having at once to deal with the problem of plenty and the problem of none. For instance, there is so much work on the question of institutions that I found it difficult to decide on what to leave out of Modules 9 and 10. In Module 11, the problem of

plenty entered in a different manner. The question of how ideology co-evolves with economic growth is so complex that there is really no way to make sense of it in one course, let alone one module. How does one find succinct readings on Marx's *Materialist Conception of History*, on Weber's *Protestant Ethics*, and Pareto's *Mind & Society*, let alone articles that make sense of all three together.

Matters were wholly different in Modules 5, 6, and 7. Module 5 deals with the problem of *Generalized Increasing Returns*, i.e. when the benefits of cost reduction by one firm is experienced by all firms in the economy through their buyer-seller relations. Though the idea was first proposed by Allen Young about a century ago, there has been little work in developing the idea. Most of the work in this direction has taken the form of 'spillovers', which travel from one firm to another through non-price routes. I have therefore had to rely on Young's original article, supplemented with some clarificatory notes. The state of affairs is no different with respect to the topic of Module 6: the Roundaboutness of Production. Bohm-Bawek's idea of how the economy becomes more productive by becoming more roundabout has found few takers among modern capital theorists. I have therefore had to rely on the only modern reference book I could find. Which fortunately summarizes many reasonable models of Bohm-Bawek's idea.

The paucity of resources was felt most acutely in Module 7, which studies the role of the price-mechanism in generating economic growth. Note that most models of economic growth have one or two prices, often wage and interest. Price, in these models therefore, is an exchange ratio not a mechanism of coordination. This is a sorry state of affairs for modern economic growth would not be possible without the nimbleness with which the price mechanism generates coordination. Consider for instance the miscoordination brought about by the tectonic changes unleashed by major inventions, the collapse of old industries, and the growth of new firms at the expense of the old. These disturbances would wreck the economic system if there were no mechanism to continually generate the incentive and information required to dovetail the plans of millions of actors. The price mechanism generates such incentives and information. None of this is to argue that the price mechanism creates perfect coordination, but that it seems to be capable of creating some order without which economic activity would drown in its own chaos.

Overall, I have not let the paucity of reference materials determine whether a topic is included in this course. For the measure of an idea is not how many have

worked on it in the past. Crowds are seldom the bearers of reason.

# 1 Some Facts about Economic Growth

It is widely recognized that economic wellbeing has considerably improved in the last quarter of a millennia. But measuring these improvements is no easy task. Measuring improvements through a summative entity like GDP is problematic because the basket of goods consumed changes dramatically with sustained economic growth. On the other hand, physical measures of output, like tons of steel produced, are equally problematic because of the difficulties associated with relating them with consumer welfare. Despite these conceptual and statistical difficulties, there are indisputable trends in certain aggregate variables that reasonably characterize economic prosperity.

## Readings

- Nordhaus (1996) "Do real-output and real-wage measures capture reality? The history of lighting suggests not"
- Easterlin (2000) "The worldwide standard of living since 1800"
- Jones (2016) "The facts of economic growth"

# 2 The Market Process and Prices

The market is a process by which individuals go about pursuing their production and consumption plans. Note that there must be some semblance of coherence between the plans of different agents, simply because one agent plans to consume or produce presumes certain behaviors on the part of others, much like how the outcome of the moves of one figure-skater depends on the complementary moves of her partner. This coherence between plans is not brought about by a central authority. Coherence between plans is brought about by the 'price mechanism', which is essentially a signalling mechanism. And prices themselves emerge from bottom-up interactions between many agents, each of whom possesses only small bits of the sum total of knowledge that is needed to coordinate the production and consumption plans of millions of agents.

## Readings

- Hayek (1948) "The meaning of competition"

- Lavoie (1985) "Coordination in Society"

### **3 The Political Process and Government**

The political processes which form and run governments are as complex as market processes. Much like in markets, actors within governments can be thought of as pursuing goals of their own, though within a wholly different setting. While market positions involve daily contestation, political contests occur once every few years. Furthermore, political contests typically occur over large bundles of goods which must be consumed by all voters, though not necessarily in equal quantities. The actors selected to office through political processes are far from the benevolent despots who inhabit textbooks. The purpose of this module is to develop a sensible, albeit non-romantic, view of governments.

#### **Readings**

- Buchanan (1954) "Individual choice in voting and the market"
- Niskanen (1968) "The peculiar economics of bureaucracy"
- Yandle (1983) "Bootleggers and Baptists"
- Buchanan (n.d.) "Politics without romance"

### **4 Specialization and Exchange**

When two or more individuals divide up a production process, with each performing some portion of the task, total output tends to be more than what would have been achieved with each performing each task. In other words, division of labor tends to increase productivity. Division of labor however generates the need for exchange because individuals no longer produce all of what they consume. And exchange requires institutional settings within which to agree upon prices and swap titles to property. Indeed, the journey from poverty to riches is little more than increasing division of labor, or concomitantly the progressive development of institutions that facilitate exchange.

## Readings

- Smith (1776) "An Inquiry Into the Nature and Causes of the Wealth of Nations", Book 1
- Mises (1949) "Human Action", Chapter VIII, Sections 3-7
- Bauer (2000) "From subsistence to exchange"

## 5 Generalized Increasing Returns

An economic system is a network of inter-related firms each of which purchases inputs from some firms, and sells its output to other firms. Some of these firms do sell their products to the final consumer, but many—if not most—firms sell their products to other firms. Note that in such a setting a decrease in the cost of production of one firm can spur an increase in the output of firms which purchase their inputs from it. This increase in output can in turn spur other increases and so on down the supply chain. This is the phenomena of 'generalized increasing returns', wherein an increase in the production of one firm generates a decrease in the cost of production not only in that firm but across many other firms. Spillovers from one firm to another can also take a non-price form. For instance, one firm may train employees, who may then work for another firm, thereby enhancing the latter's productivity. Or one firm may create a product, which is then improved upon by another. Overall, the process of economic growth must ultimately be understood through the workings of the system as a whole, rather than through the workings of an individual firm in isolation.

## Readings

- Young (1928) "Increasing returns and economic progress"
- Romer (1986) "Increasing returns and longrun growth"
- Buchanan & Yoon (2000) "A Smithean perspective on increasing returns"

## 6 The Roundaboutness of Production

The stock of capital of an economy consists of the variety of goods used in numerous intermediary stages of the process of production. Put differently, capital is the means by which production extends itself over time. In modern economies, production does not occur through the application of raw labor to nature, but through the application of labor combined with tools, which themselves are produced. The production of tools, and tools to produce tools, generate what may be called a roundabout way of producing goods. This roundaboutness at once generates an advantage and a disadvantage. The advantage is that it is capable of generating a greater volume of goods, the disadvantage is that there is a waiting period between the application of raw labor and the fruition of final consumables. Note that the creation of a net to fish makes the production process 'roundabout', and the making of a fish-net knitting machine renders the process even more 'roundabout'.

### Readings

- Malte (1979) "Introduction to Modern Austrian Capital Theory"

## 7 The Price Mechanism, Coordination, and Economic Growth

Economic growth is driven by processes that by their very nature disturb the system as a whole. In short, new ways of doing things disturb the existing ways. These disturbances are capable of cascading through the system creating considerable disorder. So much that the whole process of growth would tend to drown in the chaos of its own creation had there been no mechanism capable of engendering order, and perennially so. The principle force for engendering such order is the price mechanism. Note that the price mechanism with millions of mutually dependent prices continually adjusts all prices in response to changes in any part of the economy. Changes in prices bring about adjustments across the economy, adjustments which dovetail the plans of millions of actors. Note that these adjustments are a consequence of new prices that are discovered through bottom-up interactions in markets, some of which are dedicated to particular products, and some to complex bundles of products, yet others to bundles of bundles. There are therefore various kinds—levels—of prices,

each of which pertains to the consistency between progressively larger subsets of plans.

Economists have long worried about missing markets and missing prices in the domain of microeconomic theory, with their primary concern between inefficiency in the allocation of resources. From the point of view of economic growth, missing markets are a far more significant problem for they come in the way of reordering the economic system in response to innovative disturbance that drive economic growth.

### **Readings**

- Hayek (2002) "Competition as a discovery procedure"
- Hazlett (1978) "The German non-miracle"

## **8 Natural Resources, Population, and Knowledge**

There are two distinct ways in which population can increase per capita income. The first is division of labor. More people allow for greater division of labor, which in turn increases productivity. The second is that people generate ideas for everyone to use. More people generate more ideas, which are the ultimate source of gains in productivity. Some believe high rates of economic growth are unsustainable because they deplete resources necessary for growth. Others believe there are no hard limits to growth. As a resource depletes, its price increases, and many minds attempt to find substitutes. The history of the last 200 years marks several instances of the discovery of new substitutes as old resources depleted. The human mind is the ultimate resource, perhaps an unlimited resource when it works in cooperation with other minds.

### **Readings**

- Kremer (1993) "Population growth and technological change: One million BC to 1990"
- Simon (1996) "The Ultimate Resource 2", Introduction, Chapter 3, and Chapter 26
- Jones (2022) "The end of economic growth? Unintended consequences of a declining population"

## 9 What are Institutions?

Institutions are embodied 'rules of the economic game', i.e. not merely written rules but also norms, behaviours, and collective memory. And the nature of institutions seem to play a decisive role in generating economic prosperity, one measure of which is that income-level seems to change dramatically as we cross national borders. Institutions like well-defined property titles and functioning courts are in essence substitutes for cultural mores. While cultural mores are often sufficient to incentivize cooperative behavior among members of a clan engaged in trade at arms length, more dispassionate institutions like modern courts and constitutions become necessary to entice cooperative behavior among strangers. Many of the poorer countries of the world are still very much in the process of transitioning from institutions that facilitated arms-length trade to ones that facilitate economic cooperation between large numbers of anonymous people.

### Readings

- North (1991) "Institutions"
- Olson (1993) "Dictatorship, democracy, and development"
- Olson (1996) "Big bills left on the sidewalk: Why some nations are rich, and others poor"
- Rajan (2004) "Assume Anarchy"

## 10 Institutional Quality, Entrepreneurship, and Growth

Economic actors face the choice between 'production and exchange' on the one hand and 'pillage and plunder' on the other hand. Economising agents choose between the two modes of action by evaluating their relative costs. And the costs depend on the rules of the economic game, or institutions. Some institutions incentivize wealth-creating entrepreneurship, while others encourage poverty-creating entrepreneurship. In most societies, institutions are such that there exists both kinds of entrepreneurship, though the proportions in which the two exist can sizeably differ. Furthermore, entrepreneurs of the two kinds interact with each other, with poverty-creating entrepreneurs posing a parasitic relation to wealth-creating entrepreneurs.

## Readings

- Weingast (1995) "The economic role of political institutions: Market-preserving federalism and economic development"
- Baumol (1996) "Entrepreneurship: Productive, unproductive, and destructive"
- Justesen (2008) "The effect of economic freedom on growth revisited: New evidence on causality from a panel of countries 1970–1999"
- Tooley (2013) "The Beautiful Tree: A personal journey into how the world's poorest people are educating themselves"

## 11 Values, Behavior, and Economic Growth

Economic growth is not merely a process of change in the material ways of life. Circa 2020 is not circa 1920 with faster more comfortable cars. Nor are you your great-grandmother with twenty more years of life expectancy. With economic growth changes not merely the goods people use and how long they live, but who they are. Both the values by which people propound to live, and the behaviors by which they actually do, change in the process of economic growth. There is a bi-directional relation between the values-behaviors on the one hand and economic growth on the other. Changes in values-behaviors influence people's decisions about whether to create new products and processes, whether to discover new markets, and how much to save, all of which ultimately determines the rate of growth. In similar vein, economic growth causes people to move to new cities, alter living arrangements, abandon the clan for the work commune, develop new eating habits, and ultimately become a new being with whole new ways of living.

Perhaps nothing brings about a greater change in people than the substitution of home production with market production, which alters not only the relationship between spouses but also the very meaning of the term 'spouse'. These changes in living arrangements and ways of life are accompanied by a change in the ideas that govern our view of the world and ourselves, i.e. our ideology. This is necessary for the new way of living cannot co-exist with the old idea of the 'right' way of living, such a mismatch generates cognitive dissonance and the associated pain. Therefore,

economic growth generates new ideologies in as much as new ideologies spur economic change.

An empirically significant expression of the above noted dynamics is the co-evolution of the economic system and the caste system in India. In many ways, caste sentiments are a hinderance of modern economic growth, for ultimately it hinders the extent of specialization and exchange. Modern economic growth, particularly market-based growth, has however to some extent damaged the caste ways of life, replacing it with other ideologies. These changes have been neither smooth, nor homogeneous across different sectors of the economy.

### **Readings**

- Roucek (1944) "A History of the Concept of Ideology"
- Heilbroner (1967) "Do machines make history?"
- Morris (1967) "Values as an obstacle to economic growth in South Asia: an historical survey"
- De la Croix, Doepke & Mokyr (2018) "Clans, guilds, and markets: Apprenticeship institutions and growth in the preindustrial economy"
- Kapur et al. (2010) "Rethinking inequality: Dalits in Uttar Pradesh in the market reform era"

## **12 Environmental Pollution and Economic Growth**

Historically, economic growth in its early stages is associated with an increase in environmental pollution. Western European and the United States, among other nations, have shown a decline in environmental pollution within their national boundaries in the latter stages of economic growth. Theoretical explanations of this phenomena are not wholly tight, with the predominant explanation being that once citizens have enough bread they ask for clean air, and the polity—however grudgingly—responds to this demand for a public good. It remains unclear as to whether and how this path to low pollution would be traversed by today's low income nations.

### **Readings**

- Dasgupta et al. (2002) "Confronting the Environmental Kuznets Curve"
- Stern (2004) "The rise and fall of the Environmental Kuznets Curve"
- Newell, Pizer & Raimi (2013) "Carbon Markets 15 Years after Kyoto: Lessons Learned, New Challenges"

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