# CHAPTER TWO

# GETTING STARTED – FOUR USEFUL BUILDING BLOCKS

"*Even if as yet we are far from the stage where algebraic master models for the whole economy have meaning, there are many specific relationships where, to the great advantage of further intensified empirical research, an algebraic statement of the problem can be useful.*"

Gunnar Myrdal, *Asian Drama*, 1968) pg 31.

## 2.1 Introduction

Having recognised some of the many complexities of the task of development this next Chapter kicks off by trying to give that task some simple structure. More specifically the chapter describes a very simple "bare-bones" (BB) model of the development process in which FOUR key elements are introduced and discussed. This BB model is certainly NOT an attempt to summarise the very extensive literature on growth models that have figured prominently in the literature of development of the past fifty years. That task is assigned to Part II of the book. Nor does it attempt to engage with the many controversies that are involved in this huge body of growth model literature. That too will be dealt with more fully in Part II.

No our modest BB model is presented here solely to acquaint readers with some fundamental propositions about the nature of the growth process that can be regarded as robust for almost all countries and all time periods. This is one part of our attempt in Part I to provide readers with *a common platform of concepts and facts* that can then make it easier to relate to the more complex arguments that arise in subsequent parts of the book. So the discussion confines itself to propositions that we believe to be straightforward and uncontroversial. For example, it avoids the taking of any position about some of the critical behaviour patterns (e.g. regarding savings, investment) and other determinants of effective development. But in spite of these stark omissions, we will see that the four key propositions together stack up to tell us quite a lot about the development process and the interconnections between different aspects of that process.

Box 1 below provides readers with an early but very concise indication of how the simple ideas in the BB model relate to the richer vein of ideas, but also of controversy in mainstream growth theory as discussed in Part II.

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**Box 2.1:  Models of Growth – A Look ahead to Part II**

In the past 60 post -War years, there have been THREE main classes of growth models that have influenced the debates in development economics. First, in the peak years of "high development theory" until around 1970, the leading exponents used models that built on notions of labour surpluses, increasing returns in some sectors, imperfect markets and limited price responses as well as on ideas of dualism as between modern and traditional sectors of the economies. The somewhat more formal models of Chandra Mahalonobis(1955) – the technical guru behind the first Indian plans – and W Arthur Lewis (1954) were leading examples of this first wave. As Krugman (1999) has explained, these early approaches to "modelling" (with some models being explicit rather than formal algebraic statements) never became truly integrated into the, then mainstream economic theory.

Second, and from the 1970s in particular, the neoclassical models attributed especially to Robert Solow (1956) took over centre stage. But what a huge contrast this represented with what had gone before. Suddenly, ideas of full employment equilibria, constant returns to scale, perfect competition and friction-less responses to relative price changes became the preferred assumptions of the modellers! In the process the intensive efforts of the predecessor group to describe the complex realities of developing countries largely faded from (the modeller's) view. At the same time the model properties of that predecessor group that had readily generated (multiple-equilibrium)  results including  vicious and virtuous circles of development, were replaced by models having far more benign and stable properties. These included a relatively optimistic view of the likelihood of "convergence" – of the income levels of poor countries with the incomes of richer countries.

Third from the mid-1980s, crucial elements of the growth process that Solow et al had left exogenous (and especially technological change) became endogenised in a new wave of models that now go under the generic label of "new growth models".  For example Romer (1986) and Lucas (1988). These models restored some of the "messiness" of the first wave (for example increasing returns) - now with more formal algebraic verification – but not the associated deep historical descriptions. These newer models also suggested new ways in which the multiple equilibria, the vicious and virtuous circles and the weaker convergence characteristics of the first wave models might be generated.

Our simple bare-bones model in this Chapter is broadly and descriptively compatible with both the first and the third of these three generations of models. But it cannot be made readily compatible with the standard neoclassical model. This is because that model invokes a single commodity and so a single productive sector and so cannot offer any insights about the Structural Change and the drivers of this change that appear as propositions three and four in this Chapter.

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## 2.2   The FOUR Building Blocks

Let's make the structure of the BB model as simple as possible to enable us to grasp **four** fundamental influences on any country's development. These are:

1. economic prosperity is dependent on the *productivity of labour*

2. the productivity of labour is conditioned by the availability of physical capital ("machines" for short), human capital (education, skills and health) and the *productivity of both those forms of capital.*

3. many of the most significant increases in the productivity of labour and capital come from the *changing structure of an economy* (i.e. the manner in which its resources are re-allocated as between various types of productive activity such as agriculture, industry and services).

4. there are various drivers of that changing structure. The two key ones are first the changes in *consumer preferences* that occur as people get richer and *demand* more and different types of goods and services. The second is the changes in *technologies*

that enable certain things to be produced more cheaply than before. Additionally, in some countries, the exploitation of newly discovered natural resources such as oil, gas or gold adds an important third driver that can change an economy's structure. Finally, countries over time will experience exogenous price shocks (i.e. those not caused by any of the other three points just mentioned) that can also stimulate changes in productive structures. Note that all four of these drivers are intermediated through *changes* over time in the *relative prices* of the various different goods and services that an economy can produce and consume.

The graphic in Figure 2.1 provides a visual summary of some of the linkages between these four propositions and also identifies a few of the (many) matters not discussed in this initial simplified discussion. The question marks are important. They flag some very big issues not addressed at all in the BB model but to be discussed later in the book. Question marks such as - where does productivity change come from? And why do some East Asian economics save so much more than other developing countries?  play a central role in the large burning controversies that still pre-occupy the professional economist.

## Figure 2.1: Route Map for the Discussion
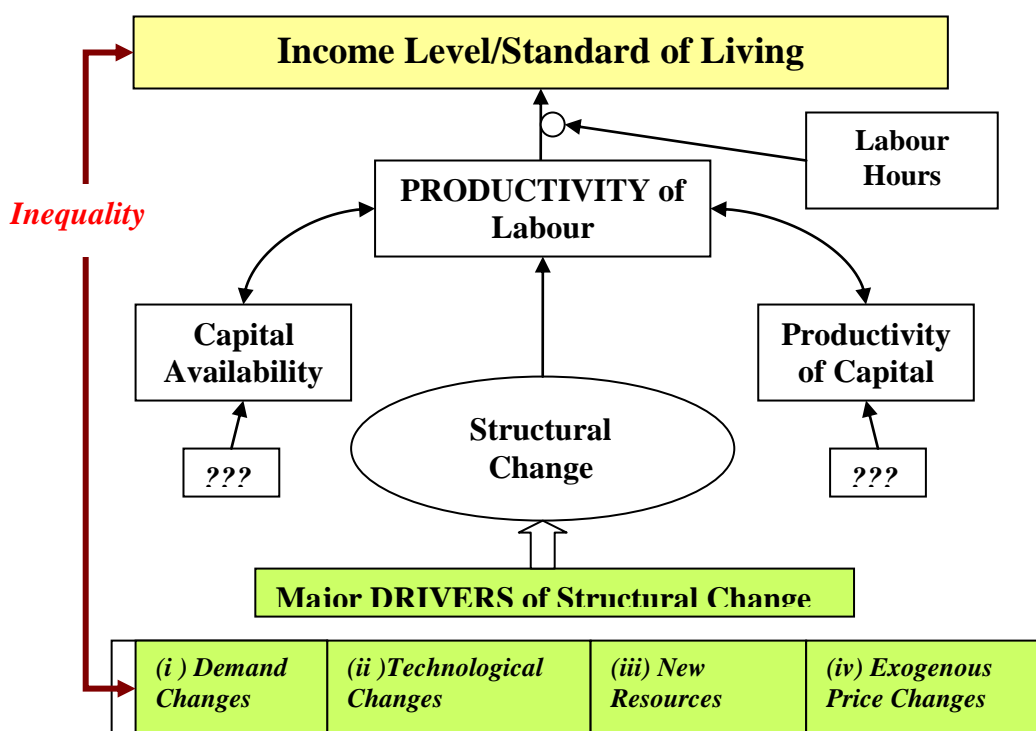


There are a few technical terms here that will be defined as we go along. We keep our task simple for the moment by assuming

- that economic development can indeed be defined in terms of *material prosperity* and measured by a country's total income/ production – Gross Domestic Product (GDP). This matter is elaborated further in Chapter 3.

- that the welfare of the people of the country – their living standards - can be measured by income per capita: total GDP divided by population.  An issue also discussed in Chapter 3.

Since there is widespread discomfort with these simplifications (Ch. 3 elaborates), it is helpful to think for the moment of GDP (absolute and per capita) as the *sine qua non* of improved prosperity. If a country's GDP remains low it will find it impossible to mobilise the improved tax revenues to provide better health, education, water and other public services. The economy will also find it extremely difficult to achieve the higher levels of demand for a diversified range of goods and services that will justify increased *private* investment, the creation of new jobs and the assimilation of the myriad new productivity-enhancing technologies now available. **So the approach here is *not* to assert that material prosperity as indicated by GDP is the *only* dimension of "development" but merely that it is a dimension that underlies much of what needs to happen as development proceeds**[1].

## 2.3   Building Block Number One - Labour Productivity is Crucial
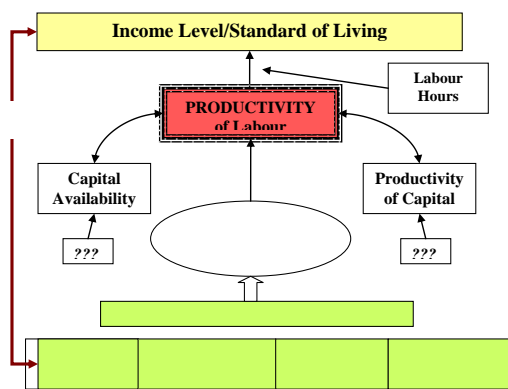


The first of the four fundamental propositions of development is that the average standard of living is directly dependent on the productivity of labour and the size of the labour input into production. If we measure labour productivity as total output (GDP); define per hours worked as (H), and define the number of persons as L, then we can see arithmetically that:

$$\frac{GDP}{L} \equiv \frac{GDP}{H} \ x \ \frac{H}{L}$$

[1] [2]

| living standards on average | average labour productivity per hour worked | labour input - hours worked per worker |

**Productivity versus Hours worked**
Countries around the world differ greatly as to the size of the two right-hand side ratios but *large* differences in living standards map closely if not precisely to differences in the first of

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[1] Analytically that approach can also be justified by the large amount of evidence showing high rates of correlation between GDP per capita and broader measures of development such as the  "Level of Living", the "Physical Quality of Life Index" and the "Human Development Index" that are considered more fully in Chapter 2. (see, for example Hicks and Streeten[1979] and McGillivray [1991]).

[2] More elaborate versions of this equation would open up other subsidiary issues but would also complicate the analysis somewhat. For example the measure of living standards per person in Equation [1], could be re-written to include $\frac{GDP}{N} = \frac{GDP}{L} . \frac{L}{A} . \frac{A}{N}$ . Where  *A* denotes those in the population who could potentially be in the labour force (*L*) –; *N* denotes the total population. So *L/A* indicates the ratio of the *actual* to the potential labour supply (i.e. the participation rate) and *A/N* denotes the ratio of the potential workforce to the total population – this latter ratio being very dependent on the age structure in an economy, and differing cultural attitudes to females going out to work.

those terms - the average productivity of labour. This is true even among rich countries For example, in 2014 hard-working Americans put in some 1,789 hours of labour input (H/L) per annum on average, which is 6% more than the British, and 21% more than the French. Among OECD member countries the Mexicans topped the rankings with an average of 2,228 hours per worker[3]. France, to take just one example, has a somewhat lower per capita income that does the USA: $42,733 in 2014 as against $54,629 in the USA. Our simple equation [1] tells us that this is partly a function of lower hours worked (1,473 per worker per annum in France as against the 1,789 in the USA) but is also attributable to France's lower labour productivity: GDP per hour worked is about $31 in the US but $29 in France. But the contrast in middle-income Mexico is much more dramatic. Specifically, the average Mexican worker labours for 25% more hours per annum than does the average American and 51% more hours than the average Frenchman, but the productivity of each Mexican hour worked is only about $4.6. The extra time at work cannot make up for this relatively low level of productivity and this is a first simple arithmetical explanation of the relatively low Mexican GDP per capita.

If we relate this simple idea to long-term historical development we can readily see how – as in the Mexican case - the first term on the right in our equation [1] dominates the second as the main motor of rising living standards. For example, the living standard of the average American today, measured in the prices of the year 2000, was more that 36 times higher than it was at the end of the 18th century. The corresponding UK gain in that same period is more than 20 times.[4] Yet the number of hours worked by the typical worker *fell* radically in that same time period: more than halving in most countries that are today classified as developed. Since more leisure has accompanied our rising prosperity, more sweat and longer hours certainly cannot be the cause of that rise: it is evident from equation[1] that it is rising labour productivity that has made possible the twin gains of higher average incomes accompanied by greater leisure.

The left hand segment of Figure 1.2 above shows the inexorable decline in typical working hours in just four of today's richest countries – the US, France, Japan and the UK in the period since 1870. In general the decline has been around 50%: from a typical figure near 3,000 hours back in 1870 to a typical figure of some 1,500 -1,600 hours by the end of the C20th). Data for a broader set of today's richer economies serves to confirm that this has been a pretty general pattern over this period.

**Now apply this to Developing Countries**
In *developing countries*, it is much harder to measure hours of work because of the self-employed and informal nature of much of the productive activity. For sure, some workers in these countries do work much longer hours than the typical American or Frenchman (examples are subsistence farmers in some seasons and sweat shop workers in export zones). Others work considerably less. However, sample data mainly for agricultural workers does enable us to get some fix on basic patterns and differences[5].

The right-hand segment of Figure 2.2 shows the prevailing level of working hours for some selected regions of five low-income agricultural economies – three in Asia and two in Africa. The data are not fully comparable across all the countries but they indicate quite clearly how far behind are the *rural populations* of low-income countries in respect of hours worked. Women in particular in three of the countries (Java-Indonesia, Burkina Faso, and Nepal) were working longer hours near the end of the 20th century than were their counterparts in the rich

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[3] Source: OECD statistics.

[4]  Lomborg (1998) pg 70 , Mitchell (1993), Floud and Harris(1996) and Flora (1983).

[5] The data used are taken from five sample surveys summarised in Buvinic and Mehra [1990] and reproduced in Tomich et al [1995]. These are for the Char Gopalpur district of Bangladesh; for Java, Indonesia; for Nepal; for the Bukoba District of Tanzania; and for Burkina Faso.

countries some 100 years earlier in 1870: more than 3,000 hours per annum. Women in the other two countries – Bangladesh and Tanzania - were working hours similar to those seen in the rich countries in the early part of the 20th century – around 2,500 hours per annum - as were the men in Bangladesh, Java and Nepal. The men in the other two countries – Burkino Faso and Tanzania - were working hours broadly equivalent to those seen in the richer countries by the 1970s – around 2,000 hours.

However, the *overall average* hours worked in these poorer countries is unlikely to be as high as suggested in Figure 2.2 for a variety of reasons. These include the seasonality of farming work; HIV/AIDS and other illnesses that reduce the hours that some can work physically; high rates of open and disguised unemployment in major cities due to the casualization of work etc. Let us assume an average labour input value for, say, Tanzania as 1,800 hours per annum (rather than the 2,000 plus of its agricultural workers in Bukoba as in Fig. 2.2) and let



Figure 2.2: Typical Working Hours per annum 1870-1992
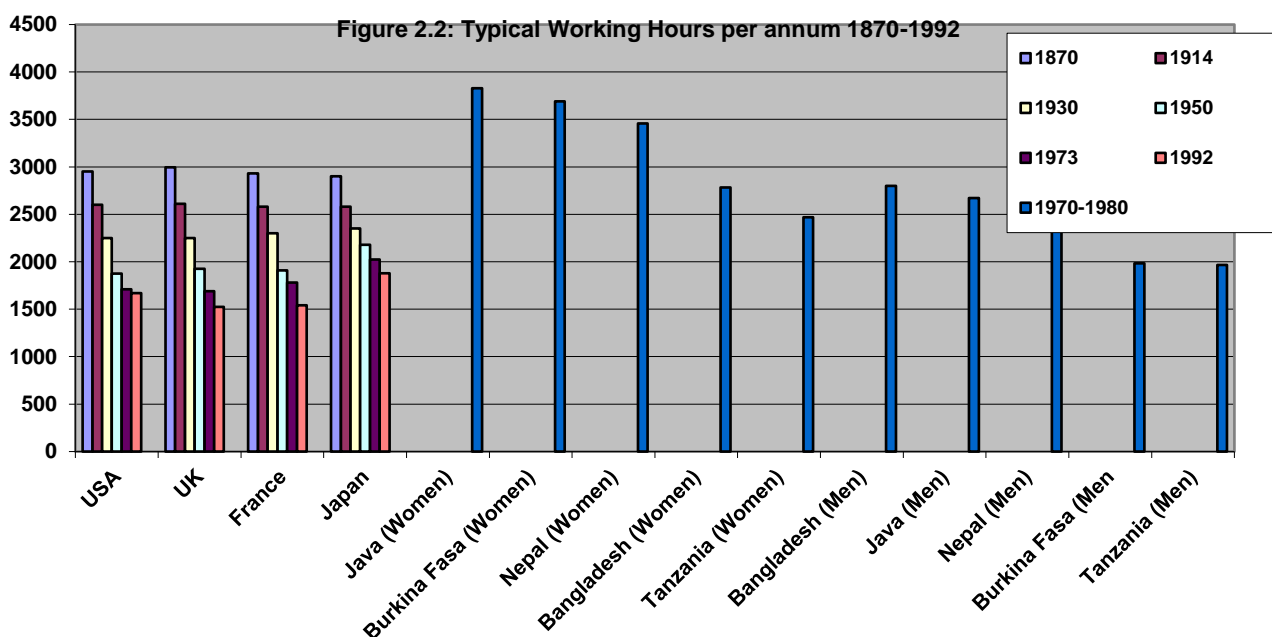
us note also that Tanzania's per capital income by 2014 was only $950 It follows from equation [1] that Tanzanian labour productivity is only $0.53 per hour worked: or less than 1.7% (about one sixtieth) of the US level!

Note that this huge difference has nothing at all to do with the effort (hours of work) put in by Tanzanian and American workers: for the moment they have both been assumed to work broadly the same 1,700 hours per annum. Nor are there any complex policy assumptions, ideologies or economic theories required for equation [1]: only some simple arithmetic.

But the example nonetheless powerfully confirms the first fundamental point about development (and living standards*) that they depend crucially on labour productivity*.

Let us take this example just a bit further. Since we do not have a firm number for hours worked in Tanzania let us assume that the average Tanzanian works a bit less hard than the average American: only 1,500 hours per annum rather than 1,700. This reduces the productivity gap just a tad: Tanzanian productivity per hour worked is now 2% of the US level and not 1.7% as before. Yet this is still a huge chasm. *Tanzanians on average are 50-60 times*

*poorer than Americans because their labour productivity is lower by these huge amounts*: they produce a **lot** less on average. The chasm is even greater than this if the 2,000 hours (male) -2500 hours (female) of work of the typical Bukoba farmer is typical of all Tanzanians!

**Box 2.2: Income: Leisure Trade-Offs are Important to Living Standards but are less available in Poor Countries**

Let's link this discussion to our earlier discomfort with using GDP per capita as the measure of development. Let's ask the question - is France really less developed than the USA? We ask this in general not to Frenchmen or women for whom the answer would be a resounding - *Non !* US per capita income is higher than in France ($54,629 v $42,733 in 2014) but the average French worker provides 18 percent fewer hours of work namely 1,473 versus 1,789 hours). Hence French development in a welfare sense is higher or lower than that of the USA depending on the value that is placed on the 316 hours per annum of extra leisure time. If this is voluntarily chosen and the French value the leisure at more than the almost $12,000 shortfall in income, then in some real sense they are better off than the typical American. The general point here is that the trade-off between work and leisure plays an important role in any final judgement about which country is more "developed". Other trade-offs such as this will emerge as the analysis proceeds and as more factors are incorporated in our, as yet, simple definition of "development".

But now apply this same logic to the comparison between Tanzania and the USA, and we can see immediately why it is labour productivity rather than work effort that explains the huge gap in living standards. In the case of Tanzania the income gap with the US is so huge that no conceivable move around the income: leisure trade-off could significantly reduce that gap. Indeed, since Tanzanian per capita income at $950 is close to the subsistence level – the level needed to provide basic nutrition and a few other basic needs – the average Tanzanian does not have the luxury to *voluntarily choose* more leisure and less effort. After any extra welfare that can accrue from extra leisure must be close to zero when indulging that preference for more leisure could threaten your survival and that of your family. It is the achievement of *a productivity level well above that required for subsistence* that creates the cushion that makes possible trade-offs such as that considered in the case of France.

**A central feature of chronic under-development in a truly poor country such as Tanzania is that both the cushion and the choices about alternative life styles are largely absent.**

## 2.4 Building Block Number Two - Capital Availability and Productivity
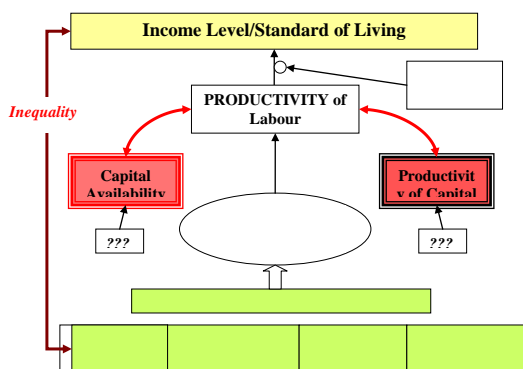


Box 2.2 makes it clear that the large gaps in prosperity between rich and poor countries cannot be explained by different intensities of work effort. Even if the average Tanzanian were to work 50 times harder than the average American (impossible of course since that would involve working over 200 hours every single day of the year), the income gap defined above would still not be closed. The labour productivity differences are much more crucial and so need to be explained.

The explanation in a mechanical sense relies on the quantity of capital (physical capital - "machines" for short - plus the "human capital" acquired by humans through their education and training and preserved by health care). These two types of capital are available to re-enforce the efforts of individual workers. US workers have productivity some 60 times that of Tanzania because they have a tremendous amount of machinery and human capital available to workers in all major sectors: agriculture, manufacturing, and, increasingly in service industries as well. Again a simple piece of arithmetic can help to show how this works.

$$\frac{GDP}{H} \equiv \frac{K}{H} \quad x \quad \frac{GDP}{K} \qquad\qquad [2]$$

labour productivity     capital intensity relative to labour input     productivity of capital input

The second of the fundamental propositions of development shown by Equation [2] is that labour productivity is dependent on the *capital intensity* of a country (K/H) and on the *productivity* of that capital (GDP/K). The reader should again note that Equation [2] also uses an identity and not any form of behavioural assumption that might invite controversy.

The richest (most developed) countries such as the USA and France achieve their material prosperity because they have accumulated a large volume of machinery and human capital[6] to support each hour of labour worked and because they use that capital relatively productively. Of course Equation [2] is again purely an arithmetic device. It poses, but certainly fails to answer some absolutely central questions about the development process. These include:

- what exactly do we mean by "capital" and how do we add together the crucial components of education and health (human capital) with physical capital (machines) in equations such as [2] above?

- what determines the volume of capital – physical and human - that countries achieve?

- what determines the productivity of that capital?

These questions in one form or another are matters that will occupy us at length in later Chapters of the book - hence the question marks on the route map diagram (Figure 2.1).

**Some Implications**
Let's for the moment persevere with our bare-bones structure to explore some important implications of this second fundamental proposition. Equation [2] shows that the mere achievement of a high intensity of capital will **not** do much for labour productivity (and so living standards) if the productivity of the capital that is acquired is **low**. A few numbers can help this argument along.

The productivity of *physical* capital (GDP/K) in some of the well-performing East Asian economies of the past thirty years (South Korea, Taiwan, etc) has typically been around 1:3 or 1:4. In other words it has required 3 or 4 units of machinery to produce a typical unit of GDP. Because these countries have achieved very high savings rates (up to 30% of GDP) during most of the past 30 years, they have been able to invest heavily to boost their capital intensities. Their stocks of machinery became both plentiful and, for the most part, remained highly productive. These countries have also successfully added to their stocks of human capital through the development of strong education and training systems.

Now contrast the East Asian experience with what happened in the later years of the Soviet Union as the inefficiencies of the socialist system of managing both agricultural and manufacturing activity became increasingly prominent. This is summarised in Box 2.3 . In

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[6] Because the more detailed discussion on human capital is provided only in Chapter 4, readers might like to note that the quantities of human capital (measured by numbers of years of completed education) are estimated to be some 2 to 2.5 times higher in the richer economies of the world than in the developing economies. Source: Barro and Lee (2000).

brief, by the end of the 1980s when the Soviet economic system was beginning to collapse, that system needed some *five times* as much physical capital to produce a typical unit of output as did the Asian tiger economies. The generally high educational standard in the USSR (i.e. high human capital) was insufficient in itself to rescue this situation.

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**Box 2.3: Capital Productivity in the USSR –1960-1989**

Capital productivity ratios in the USSR (GDP/K) rose from well below 1: 10 in the 1960s to levels around 1:15 in the late 1980s. At these higher levels the Soviets needed something like 5 times as much capital to produce a typical unit of GDP, as did the Asian tigers. The Soviets had been incredibly successful at accumulating capital: their high savings rate being assured by the coercion associated with forced deliveries of food in collectivised agriculture, and by tight administrative controls of both wages and prices. In a real sense the planning (Gosplan) supremos in Moscow could dictate that both public and private savings was always sufficient to finance large investments in the USSR's impressive industrial and military-industrial sectors. Global leadership in many areas of space exploration, nuclear and intercontinental missile technology and aircraft technology was the consequence at least through the 1960s and 1970s when the US alarm at the Soviet economic and military challenge was at its peak. But the Soviet system attached no price to capital and so had no way to assess when **too much** capital had been accumulated. Furthermore the investments that were undertaken were almost wholly determined by the state system and so were strongly influenced by political rather than economic considerations (lots if investments to further Cold-War military aims but not much to provide long-suffering Russians, Armenians or Ukrainians with better cars, smarter houses or more funky appliances). Too much capital being accumulated meant that the real economic return on the *marginal* investment gradually approached zero and so dragged down the average productivity (GDP/K) to absurdly low levels. The particular example of the mega investment projects in Siberia in the 1970s is explained further in Chapter 4.

Centralised investment allocations also prevented the pattern of investment adjusting flexibly to reflect the radical new technologies and consumer demands of the 1980s: personal computers, personal hi-fis, the increasing electronic sophistication of cars etc. The huge capital stock (K/H) did not assure a high average standard of living because of its abysmally low productivity! At the time of its collapse, per capita income in the USSR was only around 15 percent of the US level.

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There is a further important economic principle highlighted by this Soviet example. This is that capital accumulation is normally subject to diminishing returns in the manner indicated stylistically in Figure 2.3 below. The height of each of the rectangular bars in the figure represents the return on a different possible investment project. In a *market economy*, the relevant marginal returns would represent the *financial* rates of return on various different projects ranked according to those returns (highest to lowest). Investors can be expected to support the highest return projects first and gradually work their way down the list until the return on the last selected project is only marginally above the investors' cost of capital. The marginal project – the ninth from the left - is shown with the lighter shading.

In a planned socialist economy, or in public projects in a mixed economy, the government would be expected to assess the broader *economic rates of return* that reflect the broader returns to society as a whole and not just the narrow financial gains to individual investors. These are indicated as the adjusted values of the financial returns in Figure 2.3. The smaller bars on each project indicate the gaps between financial and economic rates of return. As shown for different projects in the figure, these gaps can be negative (if for example there is significant environmental damage associated with a project) or positive (if for example a project creates new jobs when there is otherwise major unemployment). The relevant marginal returns in a planned socialist economy would be those based on these broader economic rates of return. For example the broader economic returns might be lower than the narrow financial returns on some projects for reasons to do with the damaging environmental consequences of these. This is the case in Figure 1 for the first *seven* projects as illustrated where the gaps are negative: financial returns exceed the broader benefits to society

Alternatively the broader economic (*social*) returns could exceed the narrow *financial* rates of return because of their ability, for example, to create new jobs in an economy suffering high levels of unemployment. This is the case for projects 11-13 in our illustrative list of projects.

**Figure 2.3: Investment Choices in Market and Planned Economies**
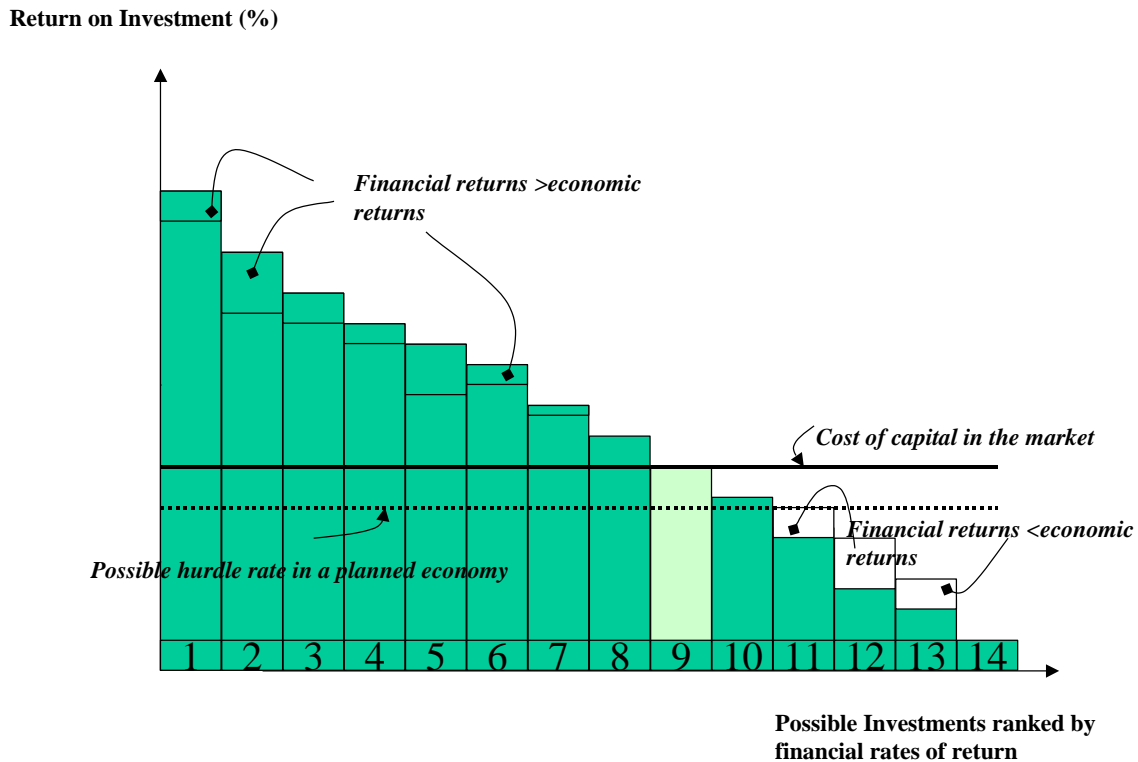


But an absolutely key issue is that *economic principles prevail in both the market and the socialist planned economies*. In both cases the marginal returns on investment will decline and tend towards zero as more investment is undertaken. This decline is arrested if there is some market cost of capital (in the market economy) or a hurdle rate of return (in the planned economy) that can signal the scarcity of capital and abort sub-standard projects.

For example in Figure 2.3 the planned economy's hurdle rate of return makes projects 9 and 10 more obviously "acceptable" than is the case when the same projects are assessed purely against the market cost of capital. Please note that in our example (and it is only an example) the broadening of the acceptable set of projects occurs for two reasons. First, the hurdle rate of return is assumed to be lower than the market costs of capital: this brings projects 9 and 10 into the acceptable range. Second the planned system (or an enlightened market system) allows the positive *social* returns of projects to be recognised *in addition* to their financial returns: this brings project 11 into the reckoning

**Economic systems around the world differ in their effectiveness in communicating the true scarcity of capital to those who make investment decisions whether in the public or the private sector, and this has a fundamental bearing on the productivity of capital that is actually achieved**. The reader can readily see that an economy that stopped investing after the *third* best project in Figure 2.3 would have a higher *average* productivity than an economy invested in all projects up to project number *ten*.

The economies of the USSR and the Asian tigers were both very good at accumulating capital. But the economic systems of the latter eventually proved far more competent in attaching a

realistic price to capital (the financial crises of 1996/97 notwithstanding) and so ensuring that capital was used reasonably productively. This is one of the reasons for their highly divergent growth rates over time as documented in Chapter 4 below[7].

Additionally the real world is a messy place in which investors often make mistakes either because they fail to anticipate some of the things that can go wrong with apparently sound investments or because they are corrupt, misguided or just plain stupid. Remember that all investment decisions and the expected rates of return that guide those decisions are always *forward-looking*. Our inability to accurately forecast future events will mean that *expected* and *actual* rates of return often diverge. Box 2.4 provides some varied examples of where planned investments have clearly been wrong-headed – at least with the benefit of hindsight.

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**Box 2.4: It's Easy to Waste Capital!**

*Example 1. The Groundnut Scheme in Colonial Tanganyika*

Post- World-War II planners in London anticipated a world shortage of vegetable oils. A scheme was developed to clear a vast area – up to 3.25 million acres of scrub and thorn bush land mainly in Tanganyika, to grow groundnuts (peanuts). It was approved by the new Labour Government and implemented at a cost of some £49 million (£ XXX billion in current prices). The clearance of land and the ploughing through roots was hindered fatally by the inadequacy of the equipment used. The soil although easily worked turned rock solid after the rains leaving the underground peanuts inaccessible to harvest. A huge labour force was ravaged by sickness in the inhospitable and remote terrain. Forecasts of the areas that could be cleared and planted were hugely in error. After the second year's harvest, only 2,000 tons of peanuts had been harvested and only about 30,000 acres planted at all. The cumulative harvest was about half of what had been planted as seed. This chronic failure was an early example of how over-centralisation of management (in this case in London) can compromise the quality of the many hundreds of separate decisions that are needed to manage a complex project. It was assumed that someone knew how to implement the land clearance and other key stages of the project, including growing peanuts on that particular site. The reality was that the proper techniques and equipment had not been invented. British consumers saw no additional food for their tax money and Tanganyika saw almost no benefit.

*Example 2: Yamoussoukro - The Paris of the Cote d'Ivoire*

One of the world's poorest and most debt-ridden countries boasts the world's tallest Christian church – the Basilica Notre Dame de la Paix. It cost an incredible $300 million when constructed in 1986-89 – half of the country's total national debt at that time. The basilica which is bigger than St Peter's in Rome covers 3 acres of land and used 7 acres of marble. It can seat 7,000 people in air conditioned pews with another 11,000 accommodated in the aisles. 300,000 people can attend in the courtyard. Obviously the narrow economic rate of return on any church is expected to be quite low. Unfortunately the spiritual return has also been extremely low since there are relatively few Christians in Cote d'Ivoire and the typical Sunday attendance for mass is only 200 persons! So the capital cost per person attending works out at $ 1.5 million each. How did a HIPC country make such a fundamental error in allocating its capital? The answer lies in the excessive autocratic power lying in the hands of the then President of the country Houphouet-Boigny. The Basilica was merely the centre-piece of a sparking new capital that the President decided to establish in his birthplace of Yamoussoukro. It had no economic logic and did nothing for the country's poor.

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[7] Some authors such as Will Hutton have argued that the greater economic success of Japan and Germany, relative to the UK through the 1980s, was due to the ability of their (less developed) financial systems to live with lower real returns on investment projects (i.e. their financial markets set a lower cut-off rate of return for new investments) Will Hutton*, The State We're In*, 1995 The counter-argument is that strong links between banks and their industrial clients as in Germany and Japan can lead to a high level of inertia in the use of an economy's available capital. Hence as particular activities decline in their importance they may nonetheless retain access to capital even though that capital could be better deployed in financing new forms of activity. This is argued for example in *The Economist* , Jan 22 2004)

*Example 3: Contemporary China*

Although modern day China is increasingly presented as an example of a new economic powerhouse – and one that will shortly overtake most OECD countries in terms of total GDP, global exports etc., - its state run system still involves many examples of chronic inefficiency and waste. A recent detailed empirical study by David Dollar and Shang Jin-Wei (2007) on this matter showed how China had wasted a significant part of the capital that it had accumulated. Specifically on the basis of a survey of 12,400 firms in 1,290 Chinese cities, for the period 2002-2004, Dollar and Wei found that wholly and partially state owned firms had lower average returns to capital than private or foreign firms by anything between 11 % and 54 %. The practical importance of this result is seen in the fact that if China could reduce the productivity gap that is today characteristic of its state-owned firms then the country could reduce its very high investment rate by 5 percentage points of GDP without any adverse effect on its growth rate. In other words by saving and investing less than it does – a change that would obviously raise living standards in terms of consumption levels – China  would not do any damage to its stellar growth performance.

## 2.5 Building Block Number Three - Changing Economic Structure as a Driver of Development
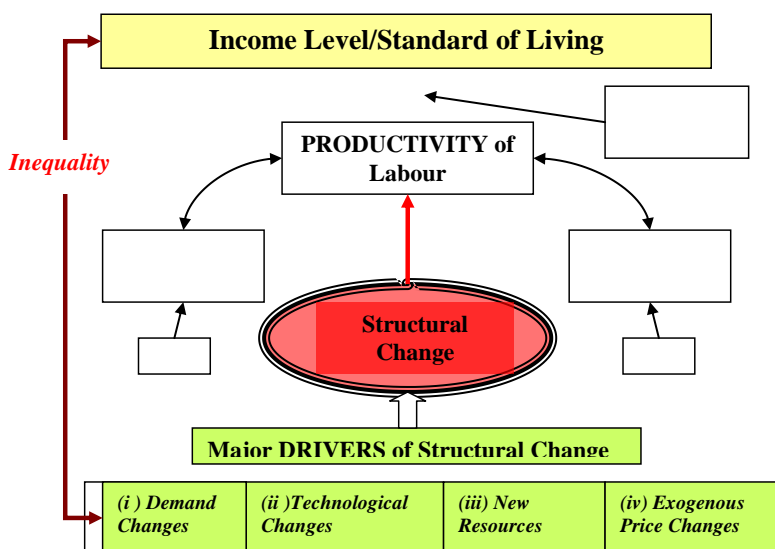


The third of our four basic propositions addresses the question of where the momentum for increased capital accumulation and higher productivity comes from. Historical evidence for almost all countries where it is available clearly suggests that rising living standards are closely associated with major shifts in those countries' patterns of employment and production. Productivity gains can and do arise from workers doing the *same* things better and with more machines and improved technologies. *However, economic history tells us that larger rises in prosperity over sustained periods of time have invariably been associated with significant parts of the total work-force changing activities: workers moving from relatively low to relatively higher productivity activities.* The most well-known generalisation of this point relates to the changing balance between agriculture, manufacturing and service sector activities.

This proposition was first exposed to in-depth statistical examination in the late 1930s by the British statistician/economist Colin Clark. He built on a generalisation first noted as far back as 1691 by Sir William Petty one of the earliest pioneers of "political arithmetik". Clark noted on the basis of detailed statistical time series mainly for today's developed economies that… "*A wide, simple and far-reaching generalisation is to the effect that, as time goes on and communities become more economically advanced, the numbers engaged in agriculture tend to decline relative to the numbers in manufacture, which in their turn decline relative to the numbers engaged in services….*"[8]

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[8]  Colin Clark, *Conditions Of Economic Progress,* First published 1939. 3rd edition 1957 pg. 492

But it is not the decline in the numbers engaged in any activity that provides the dynamic for economic growth. But it is rather the *higher productivity* of the *new* (manufacturing) activities into which people shift as their prosperity increases.

So for example let us assume that the productivity in an economy's manufacturing sector initially is twice as high as in agriculture. If during the course of the next several years, 10% of the population move from agricultural to manufacturing activities and the sectoral productivity differences persist (a big IF to be considered later), then the overall productivity of the *whole* economy will rise by 5%. Now plug this increase back into equation [1] above (where it will increases GDP/H) and we can see that the sectoral shift of employment towards manufacturing has gone some way towards improving *overall* prosperity.

A fascinating and useful feature of the tendency documented by Clark is that it applies not only to developed economies over long spans of their economic histories but also to today's developing countries as they take the first faltering steps to enhanced prosperity. If those first faltering steps *fail to happen* (as in many HIPC countries in the past three decades) then the dependence on low-productivity agriculture persists and plays a key part in explaining persistent poverty (Chapter 4 elaborates on this theme). The general applicability of the Clark-Petty tendency to successful development is what justifies its inclusion as the third of our key "getting started" propositions. At the same time the failures of many low-income countries to achieve significant gains in overall productivity (and so incomes) are partly at least explained in terms of their failure to find the higher productivity alternatives to traditional agricultural employment.

**A Digression on Low Productivity Agricultural Economies.**
Let is explore this point further using a simple proposition advanced by Tomich, Kilby and Johnston [1995]. They identified 58 low-income countries in 1990 that had at least half of their total labour forces primarily dependent on agricultural employment (including self-employment). T. K and J gave these 58 countries the label CARLs (countries with abundant rural labour). These countries overlap significantly with those countries in which we today find Collier's 'bottom billion' of the world's poorest persons. As we shall see in Chapters 3 and 4, although these CARLs account for only about half of total world population, they contain almost all of the most severe poverty found in the developing world today. So their situations need to be a central focus of this book. TK and J made use of a simple arithmetic proposition to show that the structural turning point of any economy (defined as the date when the *absolute* size of agricultural employment begins to fall) is dependent on just three parameters, namely:

- agriculture's *initial* share of the total labour force ($L_A/L_T = \alpha$)

- the rate of growth of the *total* labour force ($gL_T$), (this being driven albeit with a lag by population growth)  and

- the rate of employment growth in areas of economic activity *other than* agriculture( $gL_N$)

In cases where $gL_N < gL_T$ then the transformation to higher productivity activities cannot occur and countries are stuck long-term in dependency on low-productivity agriculture.

Where  $gL_N > gL_T$ but the initial level of dependence on agricultural jobs ($\alpha$) is very high, it may still take a very long time for the *absolute* level of agricultural employment to begin to fall: the time period being dependent on the size of the differential in the two growth rates.

Using the three parameters listed above, we can write an identity for the growth rate of agricultural employment ($gL_A$), namely:

$$gL_A \equiv (gL_T - gL_N).\frac{1}{\alpha} + gL_N \qquad\qquad [3]^{\,9}$$

Then using different hypothetical values of the three key parameters, it is possible to compute the number of years needed for any given CARL to see the beginning of a decline in its *absolute* dependence on traditional agriculture.

Using Equation [3] we can also readily identify a syndrome of persistent low productivity and incomes of the type that affects most seriously poor economies. Such a syndrome involves:

- very high degrees of agricultural dependence ($\alpha$) – e.g. values in excess of 80% as in Mozambique, Tanzania, Nepal, Burundi in the period covered by the analysis of T,K and J

- high rates of growth of population and the labour force in total ($L_T$) – e.g. 3% or more in most of those same countries, and

- relatively slow growth of jobs that offer an alternative to traditional agriculture, ($L_N$).

Amongst the 58 CARLs identified in the research by T,K and J, some had values of the key parameters that made it highly unlikely that their *absolute* levels of employment in traditional agriculture would fall for at least another 20 years (through 2010) and in some cases for much longer. This seemed likely to be the case for most of the 39 African countries included among the 58. But for some major Asian economies notably China, Indonesia and Thailand, the parameter values from equation [3] made it likely that the absolute numbers in traditional agriculture would be much lower in 2010 than in 1990. Significantly this was *not* the case for India where some 50,000 new agricultural jobs were anticipated to be needed between 1990 and 2010 because of India's then relatively slow progress in creating non-agricultural jobs to absorb a rapidly expanding population.

In the particular case of China the very fast growth of non-agricultural activities and a declining rate of population growth has already (by 2003) moved that country below the 50% dependence on agricultural jobs that defines a CARL.

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[9] This is derived by writing the percentage growth rate of agricultural jobs ($gL_A/A$) as equal to the difference ($gL_T-gL_N)/A$. Then multiplying both sides of this expression by the reciprocal of $\alpha$ (i.e. *T/A*) and simplifying we derive the expression shown in Equation [3] above. Notice that for an economy that is successfully achieving a transformation away from traditional agriculture, the term in the round bracket on the right hand side of Eq.[3] will be *negative*. But when the growth of the total labour force is very high relative to the growth of employment opportunities in new activities (N), then that negative term will be small and the overall growth of agricultural employment is by implication high. In this simple arithmetic model, agriculture is treated as the residual source of employment for the economy. But the exact rate of growth of agricultural employment depends also on $1/\alpha$ = T/A (the term that multiplies the term in square brackets). So, for example, when A is high relative to T, the negative effect on agricultural growth is multiplied by only a small number – but a higher number when A is already relatively low.

## Figure 2.4 (a): Changing Shares of Production
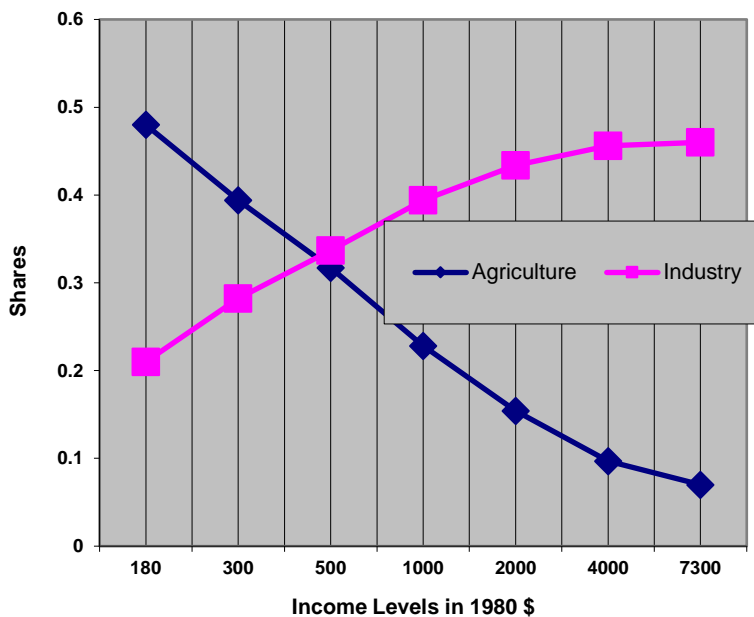


Notice that Equation 3 is merely an identity. It cannot of itself provide explanations of cause and effect or why different countries experience structural transformation at different rates. But it is extremely useful in revealing the component elements involved in structural change and so in defining specific questions for more in-depth enquiry later on. Above all it helps to remind us of the important proposition articulated by Theodore Schultz that …" *most of the world's poor people earn their living from agriculture, so if we knew the economics of agriculture, we would know much of the economics of being poor*" (Schultz (1980) *JPE* 1980.

### The Structural transformation more Generally

Some 35 years after Colin Clark's original study, two Harvard professors Hollis Chenery (also the Chief Economist at the World Bank in the 1970s and early 1980s) and Moises Syrquin conducted a more broad-based study of his key proposition that this time included cross-country as well as time series comparisons. Significantly, unlike most of Clark's studies, Chenery and Syrquin also incorporated data for a large number of developing countries. The patterns identified by these two authors are summarised graphically in Figures 2.4(a) and (b) [10]

Both of these two figures show the dominance of agricultural activities relative to industrial activities in the early stages of development when incomes are low. At that stage of development, the role of industrial (including manufacturing) activity is correspondingly very limited.[11] However, as real incomes rise the production-dependence on agricultural production declines very rapidly. In fact the share of agricultural production falls rapidly from around 50% from the very lowest incomes shown on Figure 1.4a to the much lower figure of

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[10] The data here are from Chenery and Syrquin (1986). The econometric analysis used to generate these figures involved ordinary least squares regression applied to up to 108 countries and covering the long period from 1950 to 1983. The general form of the regression equation(s) used was $X = \beta \ln Y + \beta_2 (\ln Y^2) + \gamma \ln N + \gamma_2 (\ln N^2) + \Sigma \delta_i T_i$ where $X$ = a variable such as the share of agricultural output in GDP; $Y$ = per capita income and $N$ = population. $T$ is a series of time period dummy variables covering the periods 1950-60; 1960-67; 1967-73 and 1974-1979. The quadratic terms on income and population ensure the curvature of the changes in X over time in relation to Y. The two figures show the *fitted* values of these estimating equations.

[11] we here include utilities, mining and construction as a part of "industry" but the trends and productivity differences as discussed are even more marked when "manufacturing" industry alone is compared with agricultural activity.

30% at an income of $500 (in the prices of 1980 as used by the two authors). In that same span of incomes the share of industry production rises from around 20% of the total to well over 30% again for the "typical" economy. Notice that the cross over point when the share of industry overtakes that of agriculture is around $500 in the prices of 1980.
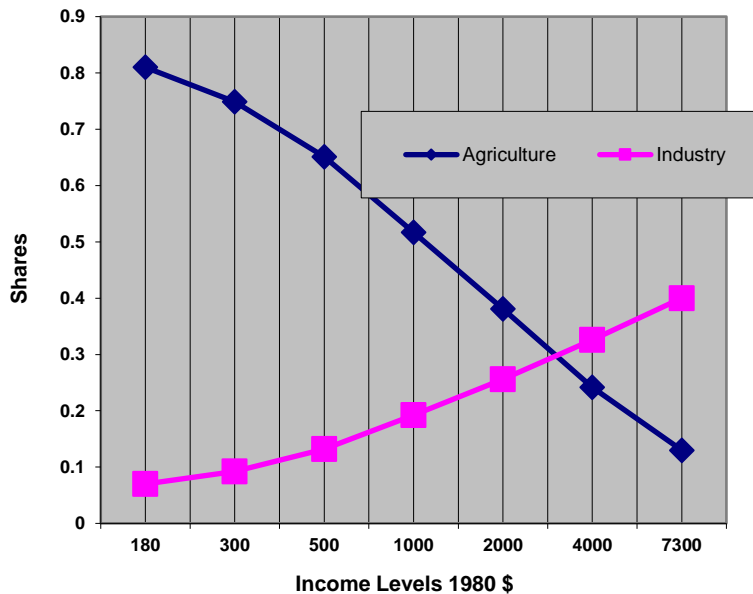
### Figure 2.4 (b): Changing Shares of Employment



**Income Levels 1980 $**

The sectoral changes as regards *employment* (Figure 2.4b) are similar in direction but with substantially different gradients of change. The cross-over point when agriculture ceases to be the main source of employment comes only at the relatively high income of around $,3200 per capita.

Our point about productivity differentials made earlier is readily confirmed by using the Chenery-Syrquin data points. For example, at income levels below $300 per capita, agricultural accounts for 48% of total *production* (Fig 2.4a) but for 81% of total employment (Fig 2.4b) The corresponding shares for industry are 21% for production but only 7% for the share of the labour force. If these two sectors had *equal* productivity of labour then the shares of production and employment of each of them would be the same. e.g. with 81% of the labour force, the agricultural sector should also produce 81% of the economy's output. Its failure to produce anything like that much confirms its extremely low productivity as compared with industry. At low income levels, industry (including utilities such as electricity generation and construction) produces 21% of total production but with only 7% of the total labour force.

The persistence of significant albeit declining productivity gaps as between agriculture and industry also accounts for the higher income at the intersection of the agriculture and manufacturing line plots in Figure 2.4b (employment) as compared to Figure 2.4a (production). Agriculture stays important as a dominant source of a typical country's *employment* much longer than it stays relevant as a source of its *production.* Specifically the cross-over point for employment is at an income level of around $3,200 per capita (Fig 1.4b) which compares with $500 in the prices of 1980 for production (Fig 1.4a)

By scrutinising the Chenery-Syrquin data, the reader will see that the sectoral differentials in productivity diminish as incomes rise but are never fully eliminated. Even at relatively high incomes of more than $5,000 per capita in 1980 prices, the agricultural sector accounts for 13% of the labour force but produces only 7% of total output. Industry at that same income level is responsible for 46% of total production but only 40 % total employment.
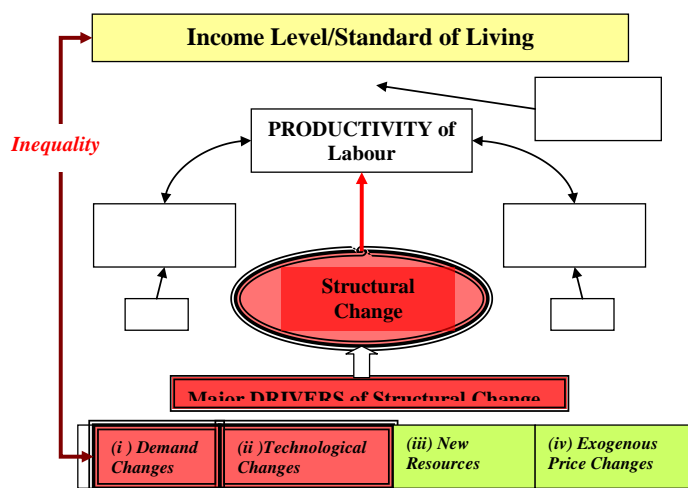
## 2.6 Building Block Number Four: Consumer Choices and Changes in Relative Prices Drive Structural Change



So far in this Chapter we have proposed three building blocks or propositions for our basic structure of the development process. We have noted:

- that labour productivity is the main influence on living standards

- that the *availability* of capital (including human capital) and the productivity of that capital drive labour productivity

- that changes in economic structure can drive productivity changes

But the keystone that will lock this bare-bones structure together is still needed. The final building block is the one that tells us something about the forces that drive changes in an economy's economic structure over time. The answer, and our fourth basic proposition is that *the first key influences on changing structures in any economy is changes in consumer choices (or preferences).* The second such driver of structural change is technology and this is also considered briefly below.

**Driver No. 1: Consumer choices/preferences**

Consumer demands and the preferences that motive these enter the story in a straightforward manner. It is well established that as individuals and countries get richer they spend a declining proportion of their incomes on essential goods such as basic foods and basic clothing and a rising proportion on less essential items of both goods and services. This point was elaborated by the main collaborator of Karl Marx namely Friedrich Engels in his study entitled *The Condition of the Working Class in England in 1844.* As a consequence the relationships between income levels and the proportion of that income spent on particular goods and services are often referred to as Engels curves.

In the early stages of development this proposition manifests itself as a declining proportion of spending on basic agricultural goods and a rising proportion on simple manufactured goods including processed rather than basic farm products. In higher income economies it manifests itself as a switch from manufactured goods into greater expenditures on services. Figure 2.5 below shows the most important example – the Engels curve for food consumption. This is derived from the same Chenery-Syrquin source referred to earlier. Note that for this sample of countries, the share of food in total consumption declines from almost 40% to only 15% as between the lower and higher incomes in the sample countries.

**Figure 2.5: Rising Incomes and Food Consumption**
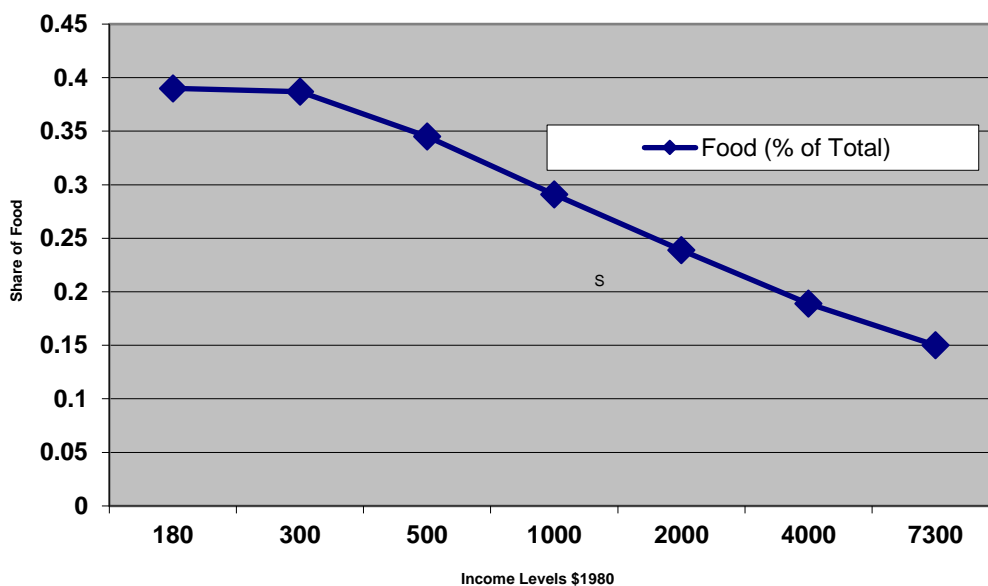


**A Digression on Inequality**

If we probe this relationship between the levels of income and the patterns of demand a bit more closely, we can readily see that the manner in which income is distributed (e.g.) can play a key role in influencing the nature and pace of structural change. For example is income distributed evenly across all people or unevenly in favour of a rich few We can then also see why we have included a link labelled "Inequality" from the drivers of change to living standards in the route map diagram of Figure 2.1.

Consider for example a country which is achieving a reasonable rate of economic growth (say 3 percent per capita) while preserving a fairly even distribution of income. This will ensure a broad based change in demand across a wide spectrum of goods and services. If people

generally are getting richer at the rate of some 3% per annum, then the society will show the gradual move along the Engels curve for food. (Figure 2.5). This in turn will signal the need to produce relatively less agricultural/food products and rather more manufactured goods as well as new service products (the Engels curves for these although not shown here will indicate a rising demand as income rises). The production and trade patterns of the economy will evolve in broad sympathy with these changes in demand patterns.

But then contrast this case with one in which income in the country on average is rising by 3% but with the rises highly concentrated in a narrow elite of richer persons with the mass of poorer persons being left behind with income gains close to zero: the reality in many poorer countries. This pattern can be symptomatic of economic growth based, for example, on the exploitation of an important natural resource such as oil and gas where the income gains from the natural resource accrue to only a small elite: e.g. in today's Equatorial Guinea[12]. In this case the declining relative importance of demand for agricultural/food products will be seriously diluted by the persistence of low incomes in the mass of the population even though the income gain on average remains at 3% per annum. At the same time the demands for new goods and service expressed by the small elite whose incomes are rising very rapidly, are far less likely to be reflected in a wide range of new productive opportunities in the domestic economy. Indeed, the building of snazzy yachting marinas and expensive houses, the imports of Mercedes cars, Rolex watches and other luxuries from abroad provided to the few who can afford them, are more likely than broad-based domestic manufacturing of new goods to meet a broad-based demand.

**Inequality in the course of economic growth is seen in this simple example as a factor than can short-circuit the otherwise powerful link from income gains to a changing economic structure.**

We need to worry about inequality not only for the ethical reason that it is unfair for the gains to be shared so unevenly. It is also a negative for development because it delays structural changes in demand and production patterns that might otherwise contain the potential to lift the overall levels of productivity in the economy by shifting significant numbers of people into higher productivity activities. Remember the CARLs. They need the more rapid growth of jobs in the higher productivity non-agricultural sectors IF they are to see the structural transformation that has been invariably associated with development. But this is less likely if the growth they actually achieve is distributed very unevenly. More generally when we examine and compare the average income growth rates of different countries later in this book, we need to always look very critically at how that average gets distributed!

There is a long tradition in development economics going back at least to the work of Simon Kuznets that seeks to find an empirical link between income levels on the one hand and degrees of income (or consumption) inequality on the other. The relationship found by Kuznets (1955) corresponded to an inverted-U shaped curve. That is to say, with increasing per-capita income, inequality first experiences a rising tendency followed by a decrease thereafter. According to Kuznets this is caused mainly by structural changes in the dual-economies that characterize most low-income countries. More modern research due to authors such as Deininger and Squire (1998); Ravallion and Chen (1997), and Chen (2003) largely repudiates the concept of a "U" shaped relationship. Hence we cannot draw on any robust empirical statement to conclude this digression. Deaton (2013)[13] in more recent work linking changes in

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[12] This former Spanish colony is one of Africa's largest oil producers. But since independence in 1968 it has been ruled by two men from the same family who have been widely described as among the worst abusers of human rights on the continent.

[13] Angus Deaton, *The Great Escape: Health, Wealth and the Origins of Inequality*, Princeton University Press, 2013

material prosperity and health, has noted that many of the historically positive improvements in these areas have led almost inevitably to some initial increases in inequality (of incomes, health outcomes) as the initial benefits accrue to some but not all. Certainly, the propositions underlying the "inequality" arrow in Figure 2.1 remain important and we will return to them later in the book.

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**Box 2.6: Sectoral Shifts and Likely Development Patterns**

Significantly the great philosophical arguments about development in the 1950s and 1960s revolved around the case for the world's poor countries emulating the rich countries by developing far greater *manufacturing* capacity and using this to absorb more and more people from low-productivity agriculture. Many of the exploitative theories of under-development from the 1960s relied heavily on the first world's ascendancy in manufacturing. But now in the second decade of the new Millennium there is much less clarity about the sectoral patterns that are associated with a *fully developed* economy. France and the USA, for example now employ more than 70% of their labour forces in the *services* sectors and less than 30% in their industrial sectors. Japan employs more than 60% in services and only a little over 30% in industry. China even as a still poor country, already employs 40% of its population in the services sectors and this percentage is rising to converge on the declining proportion in the agricultural economy (now down below 50%) probably within another decade!

So in those countries that achieve the income gains necessary to change their patterns of demand (and many CARLs and others have failed in the past thirty years), we can expect the new patterns of demand and production to involve a mix of increased manufacturing **and** services activity. Additionally, global increases in the demand for manufactures will be accommodated by supplies from increasingly higher productivity sources of supply (irrespective of whether those sources are located in the domestic economy of the developing country or in some overseas source country). As a result *manufacturing employment* is unlikely to grow at the same rate as the rising demands on, and the produced levels of manufacturing *output*. Service sector employment on the other hand is likely to grow at a similar rate to the rising demands on services for two key reasons. First, it will be more difficult, than in manufacturing, to achieve the productivity gains to economise on the labour input needed to provide particular services. Second, it is harder to trade many services internationally and so there should be a closer link between higher domestic demand and higher domestic production.

This is one reason why China's spectacular economic growth since the 1980s has resulted in a very significant increase in the relative importance of both output and employment in the *services sectors*. By contrast China's impressive gains in industrial activity are matched by a much slower growth of employment in that sector.

ADD AFRICA EXAMPLES

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## Changing Global Patterns in Demand

The past thirty years have seen a particular but important manifestation of this changing pattern of demand. Although it is more evident in rich countries it also has important implications for the developing world. Specifically, those years have seen a remarkable 20 percentage point *decline* in the proportion of incomes in rich countries spent on *physical commodities* (less than half of the average persons income is now spent in this way). There has been a corresponding explosion in the proportions of incomes spent on air travel, hotels, restaurant meals, gyms, other leisure activities, health care, nursery schools and, inevitably psychiatrists. Even *within* manufactured products there has been a switch in demand to the "softer" service-related aspects of a product – design, packaging, promotion, retailing – and a much smaller content for the pure manufacturing activity. In general far fewer people now actually *make* major products such as cars, televisions, computers and washing machines than are engaged in their design, advertising and retailing! Britain, for example has around 600,000 persons working in pubs, bars and clubs that sell beer, but only around 20,000 persons actually working in breweries. So there are 30 times more people engaged in *selling* beer than in actually *making it*! This pattern is repeated all over modern economies.

The precise nature of these shifts in spending patterns as incomes rise will be different in different time periods and in different country circumstances. But the fundamental point – returning to our fourth basic proposition - is that *as spending patterns change they signal the need for production and employment patterns to also change* to accommodate them.

That signal will not be transmitted necessarily instantly, easily or without interference. In very small countries for example, changes in local spending patterns may have more impact on *imports* than on local production and employment. (true of Micronesia and American Samoa for sure but also for slightly larger economies). Chenery and Syrquin in the study already mentioned found that larger countries (measured by population size) typically achieved a higher industry share of GDP than did smaller countries having similar income levels. This was mainly because the typical larger country found it easier to convert rising demand for manufactures into rising *domestic production* than did smaller countries.

In economies with inflexible labour markets or high rates of protection of established industries it may in any case be difficult for production patterns to change quickly in response to new patterns of demand. In fully planned economies, such as the former Soviet Union, changes in consumer preferences have no easy way to show up in changes in *actual* spending or to get reflected in new forms of production. This is part of the reason why consumers in the USSR had to wait until the 1990s to get the consumer goodies like Sony walkmen and air-conditioned cars that Americans had enjoyed for at least a decade.

These are caveats that apply to individual countries. At the level of the world economy as a whole, the forces coming from changes in spending patterns are powerful and inexorable. Like the rising waters in a flood they find their way eventually into the nooks and crannies of global production and employment.

**Driver No. 2: Technology and Differential *rates of Productivity Change***
The second of the important drivers of structural change is technology and the adjustments in rates of productivity that the accumulation of improved technologies makes possible. This second driver works from the supply (production) side of economic activity unlike the first driver that works from the demand side. Changes in technology and productivity have their influence through relative prices which in turn interact with the changes in spending patterns to further influence production patterns. Unfortunately we cannot draw on any parallel uniformity like the Engels curve to predict how the availability of improved technologies in any particular economy will evolve as incomes rise. This really is a topic that we have to hold over for detailed discussion in Part II of the book. We can however illustrate the potential for the technology impact on structural change by referring to one of the more dramatic example of recent times.

In the past 30 years, modern flexible and computer-dependent technologies have revolutionised the costs of producing almost all *manufactured* products. This is true of cars, computers, shirts, shoes televisions, computers and condoms. It applies irrespective of whether the production is in Liverpool, Luton, Lisbon, Pittsburgh, Houston, Shanghai or Seoul. Productivity gains in all areas of manufacturing have been large and relentless. One result has been that in spite of large percentage increases in the demand for such goods, their prices relative to all other goods and services have declined. Computers are the classic example. For less than $1,000 any family can now have a computer in their own home  many times more powerful than the ones that in the 1960s used to control atomic energy research at Harwell in the UK or the payrolls of major US corporations. So a major reason for the general decline in the share of manufacturing in GDP (and the even larger decline in manufacturing

employment) is that *the relative prices and costs of manufactured products have both fallen dramatically in relative terms[14].*

Let's fix this point by making it a bit more general. If an economy (or the world as a whole) discovers higher productivity (lower cost) ways of producing certain goods or services, then their prices relative to other goods and services will fall and their share of both total production and employment can also *fall* even though the demand for them continues to rise rapidly.

### Production

Since the previous sentence is something of a mouthful, let us break it down into bite-sized pieces. The important point to remember is that *production* is measured as a price ($P$) multiplied by a quantity ($Q$). In the case of a *manufactured good*, the spending patterns of recent years reveal an ongoing rise in demand for more of these in absolute *quantitative* terms. But the inexorable and large productivity gains have driven down their prices so much that $P_m$ x $Q_m$ has fallen over time, even though $Q_m$ has risen. In the case of *service industries*, productivity gains have also been achieved but it is inherently much harder to achieve large gains in, for example, the productivity of waiters, personal trainers, hospital consultants to say nothing of psychiatrists. Hence, as spending patterns have increasingly shifted more demand towards *service sector* activities, relative prices for these sectors have tended to fall less if at all. So $P_s$ x $Q_s$ has tended to rise because the magnitudes of the falls in $P$ (if any) have not been large enough to offset the rises in $Q$.

### Employment

The different rates of *productivity* gain in the manufacturing and services sectors result in equivalent differences in the amount of labour needed to do certain tasks. Hence in manufacturing the productivity patterns of the past thirty years have typically translated into a relatively slow rise (or even a fall in some major countries) in manufacturing employment and a corresponding rise in the service sector employment. *There is no contradiction in saying that an inexorable rise in the demand for manufactured goodies can coincide with **fewer** people engaged in their production.* So China as one major example can become hugely more important as a producer of the global quantities of manufactures without seeing this translated into particularly large increase in manufacturing employment. At the same time since the populations of richer countries in particular have increasingly signalled their demand for more services of all types, that has translated into more employment in service sector industries because of the relatively limited scope for productivity gains.

## 2.7 Two Insights from the Bare-Bones Model

The bare bones model is just that: a basic skeletal structure with none of the metaphorical flesh, blood organs and bones that define the true complexity of real economies in the modern world. The model here also insulates the reader from the mathematical rigour needed to present the formal theories of economic growth that are considered in Part II of the book. The model has been presented in an intentionally parsimonious manner to focus attention narrowly on the four basic building blocks (propositions) of the development process. But for all its simplifications, it can nonetheless provide insights into a number of recurring themes of development controversy. Here we consider just two examples, namely:

1. Should we have reservations about productivity improvements?

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[14] This lowering of costs has caused a staggering rate of acceleration in access to new products. For example it took fully 38 years for the radio to achieve 50 million listeners. But it took only 16, 13 and 4 years respectively for the 50 million user mark to be achieved by the personal computer, television and the internet.

2. How can we analyse changing society preferences for a better environment and more regulation of, for example, food quality and work-place safety?

## Example No. 1: The Paradox of Rising Productivity

The first of our four propositions explains why improved labour productivity is such a key influence on living standards. We have seen, for example, that the typical American is more than 30 times better off than was the case in the 18th century even though he or she works less than 50% of the hours of their forebears. This impressive improvement was made possible because of much *higher labour productivity*.  But this being the case why is there so much anxiety about the huge productivity gains that have been and are still being achieved in both the richer countries and in many of the successful developing countries of the past two decades such as China and Chile? One sort of answer to this paradox is set out in Box 2.7 that also gives reasons why the anxieties are misplaced.

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**Box 2.7: Productivity Growth and Global Capitalism: Two Views**

In 1997, William Greider published one of the most substantial and widely quoted books on global capitalism. Here are two reviews of this same book – the huge gulf between them is a parable for the gulf between the intuitive "man-in-the-street" view of productivity change and the professional economists view.

John B. Judis wrote,  "The book contains a core argument about industry and labor, which I believe to be true. Greider contends that in many key industries – including autos, textiles, steel, ships, aircraft, chemicals; computers and drugs – the world's companies are capable of producing far more than the world's consumers can buy. Such overcapacity for autos, for instance, runs as high as 25%, and will probably rise as each country tries to develop its own auto making industry. And the overcapacity is getting worse, for a couple of reasons. Advances in technology allow industries to produce more goods with fewer people (*in effect, creating more supply than demand*). Meanwhile, Japan, China and other Asian nations have adopted, mercantilist trade strategies: they have sought, through barriers or government subsidies, to guarantee surpluses. By definition, such a strategy expands the supply of goods without proportionately boosting demand.

Paul Krugman titled his review "The Accidental Theorist: All work and no play makes William Greider a dull boy" – so you can see what he thought of Greider's book !!!

Krugman writes…"his book is a massive panoramic description of the world economy, which piles facts upon fact, in apparent demonstration of the thesis that global supply is outrunning global demand. Alas, all the facts are irrelevant to the thesis: for they amount to no more than the demonstration that there are many industries in which productivity and the entry of new producers has led to the loss of traditional jobs – that is hot dog production is up, but hot-dog employment is down. Nobody, it seems, warned Greider that he needed to worry about the fallacies of composition: that the logic of the economy as a whole is not the same as the logic of a single market.

He continues " I think Greider would answer: that while I am talking theory, his argument is based on the evidence. The fact however, is that the US economy has added 45 million jobs over the past 25 years – far more jobs have been added in the service sector than have been lost in manufacturing. Greider's view, if I understand it, is that this is just a reprieve – that any day now, the whole economy will start looking like the steel industry. But this is a purely theoretical prediction – he and his unwary readers imagine that his conclusions simply emerge from the facts, unaware that they are driven by implicit assumptions that could not survive the light of day."

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In brief the global productivity gains of some industries has indeed been very rapid in the past 20 years: examples are computers and cars. A number of developing countries notably in parts of East Asia have seen particularly rapid gains in the productivity of their manufacturing sectors, and have also "imported" much production capacity from richer countries such as Britain and the USA. So overall world productive growth has been close to 4% per annum which implies a doubling of output every 18 years or so. This has led some commentators

(Greider and Judis for example) to argue that the world is doomed to encounter gluts of *some* manufactures: the world's companies are increasingly capable of producing far more than the world's consumers can buy of cars, textiles, ships, aircraft, steel etc. These gluts, they claim could mean that the gains in living standards that equation [1] shows we can obtain from higher productivity - being able to get 4% more income *each* year with the same labour effort (or the same income with 4% less effort) are illusory. Can this really be the case?

The logic set out by Krugman in Box 2.7 shows that it cannot be – the basic proposition about the beneficial effects of improved productivity is still correct.

The familiar anxieties about over-production and gluts derive either from bad economics (as argued by Krugman) or from a concern with the global distribution of the gains from the productivity improvements.

**Bad Economics**
The *bad economics* involves the failure to recognise that every $100 of increased production always generates an equal $100 of extra income (either in wages or in profits). John Judis is quite wrong to assert that producing more goods with fewer people implies an excess of supply over demand – *it is income not the number of jobs that create demand*. Only if there is some systematic tendency for more of that extra income to be saved over time can the supposed glut really persist and grow – and there is no such evidence – indeed many economists worry about the declining savings (and rising debt levels) in some rich economies such as the USA and the UK. Equally while rich consumers may well get satiated with *particular* goods, there is no real likelihood that satiation will occur for goods and services in general. If you still doubt this, do a reality check on this with the richer of your friends who already own two or more houses and several cars. Does their considerable wealth really discourage them from yet more shopping? So particular firms that systematically produce too much of a particular product will routinely fail – that has always been the case. But *systematic* over-production of all firms and at the global level is ruled out.

**The Distribution of the Productivity Gains**
The anxieties regarding the *distribution of the productivity gains* are real but we need to see how they arise. The problem is primarily one to do with rich country employment of mainly unskilled labour. As vertical disintegration of production has shifted more manufacturing and service jobs from Western Europe and the US to Asia, Africa, Latin America and E. Europe, employment levels in *particular* industries such as steel and textiles in the USA and Western Europe have undoubtedly fallen or have failed to rise. As we noted above, this decline is also in part a natural consequence of the differential productivity changes achievable in manufacturing as compared to service sector industries. The public demand for more services of all types has translated into more employment in service sector industries because of the rising demand and the relatively limited scope for productivity gains in those sectors. But significantly this has been just as true in a relatively successful low-income economy such as China (see Box 2.5 above) as in rich economies such as the USA or Britain. ADD SOME GRAPHICS FROM MCI 2019

The *world as a whole* is better off because of this package of the productivity gains. Specifically, more output in aggregate is being produced with less aggregate commitment of scarce labour effort (Equation [1] again). Rich country workers who retain jobs have the same income but now purchase more of their cars, shirts or handbags at lower cost from the lower-income country that now supplies a larger share of these products. The rich countries *generally* will be better off provided that new forms of employment rapidly emerge to replace those involving job losses. But if there is a systematic increase in rich country unemployment or in the more likely rise in sub-standard and poorly paid jobs (e.g. zero hour contracts as in the UK) then a *sub-group of displaced workers* (and then only a sub-group) will lose out because of the changes.

The full employment condition is crucial for determining whether the society as a whole will benefit from the global productivity improvements,

As far as the poorer countries are concerned the problem is similar. In the absence of rapid productivity growth in manufacturing, a growing economy such as China would see more agricultural workers absorbed in a growing manufacturing sector. But if China's manufacturing productivity is rising – because of its rapid absorption of western production and management technologies (as indeed is the case) – then job growth will be slower for any given growth of manufacturing output. This means that more labour will remain for longer in agricultural employment much of which will involve low productivity. We can think of this large *reservoir of unproductively employed workers in China* as the analytical counterpart of the *under-class of displaced workers in*, for example, the USA. The "surplus" workers in China's inefficient state industries add further to this reservoir of potential labour (see Box 2.5 above).

In both cases, - the rich USA and the middle-income China - the economies as a whole are producing more output in total and *average* living standards are much higher because of the productivity gains. The problem is that higher productivity leaves both types of economy with possible increases in inequalities in the sharing of the larger pool of output within the economy in question. This is the source of most of the concerns that are expressed.

Note that this is *not* a rich versus poor country problem. Both categories of country face the same issue but in different ways.

The possible solutions to this type of problem lie in the realms of taxation and the other re-distributive policies that will be discussed more fully later in the book. But, it would be a fundamentally anti-development decision to somehow eliminate the productivity gains themselves – our bare-bones model is quite right to highlight these as the *sine qua non* of successful development. [15]

## Example Number 2: The Changing Preferences of Society

Our fourth proposition about the key role of consumer preferences in driving development has a much broader interpretation than we have so far exampled. Engels-curve effects are normally applied to the things that people purchase using their *own incomes*: bread, beer, biscuits, booze, cars, holidays etc. But they can also be applied in principle to services of various types that people benefit from without directly paying for them. We refer here to a range of *public goods* - publicly provided goods and services such as police protection, roads, schools, hospitals, the regulation of banks, control of environmental pollution etc. They can also include the domestic government's efforts to promote a better world order by, for example, maintaining a generous aid programme, supporting the UN security presence in Kosovo or Darfur, the Kyoto and the more recent Paris Initiatives on global climate change and a whole slough of other international initiatives (international public goods).

Because these goods and services are typically paid for out of general current taxation or by way of government borrowing (implying higher taxation in future) they require a degree of societal consensus about the priorities and the levels of taxation that are acceptable. Such a consensus is irrelevant only in cases of repressive autocracies where the government can

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[15] in the rich country case, one crucial policy difference that can be observed across different countries relates to wages and employment policies. In France, Germany and some other countries of Western Europe, a relatively generous minimum wage combined with restrictions on retrenching labour means that productivity change is less easily able to force down the earnings of relatively unskilled workers. But, at the same time it means that the unemployment rate amongst such workers is higher because of the disincentive employers face in engaging new staff. In the UK by contrast, where wages are far more flexible downwards, lower relative wages for less skilled workers is a consequence of improved productivity but levels of unemployment among such workers is lower.

impose its own view: and even then only until such time as public dissent causes the downfall of the government (vide the Soviet Union).

These public goods and services are analysed more deeply in Part III of this book (especially Chapter XXXX on Public Goods). But here let us merely note that if structural change generally is driven in part by the public's changing attitudes to spending its own incomes, so too will a country's stance regarding the supply of a whole range of public goods and services. Two key factors are involved here:

1. Taxable capacity (including borrowing potential)

2. Degree of social consensus and democracy

**Taxable Capacity**
This first point enables us to see that there is something inevitable and *structural* about the poor quality of many public services in developing countries as well as the apparently lower degree of interest of such countries in "crucial" issues such as actions against global warming, the limiting of genetically modified foods, and the better regulation of noise pollution. Note in this context the reluctance of India in particular but also China to phase out coal-fired power generation in the interest of reducing the pace of climate change. Quite bluntly people in poor countries such as Tanzania or even poorer countries such as Chad would like to have much better schools, hospitals and roads, and would even be happy for their governments to do more in promoting a better world order. Poor country populations would like these things in much the same way that many people with modest incomes in the UK or the USA would like a penthouse in Mayfair or a yacht in Monte Carlo or Boca Raton. But insofar as the poor of the world are able, through the democratic system to collectively express their preferences for spending scarce tax revenues on these and other things, they will come out with radically different choices than would the taxpayers of the USA, France and the UK. There are two reasons.

First, their collective tax income is chronically low relative to that in the richer countries. Second they are much less far along the relevant Engels curve – their immediate basic needs for clean water, simple feeder roads, and basic primary education are unmet. So why would we expect them to espouse public expenditure agendas involving desirable but unattainable public objectives such as a clean air act or a smoke detector in all public buildings? Let us consider just one contemporary example that relates to the controversies over Climate Change. The rapid growth of China in the past 20 years using environmentally "dirty" technologies has rapidly made China into one of the world's largest polluter – ahead even of the profligate USA. But although it may be *de rigueur* for the global environmental forums to criticise China for this situation, it may be unreasonable to expect China to respond to the problem in quite the same manner as should, for example, the United Kingdom.

**Social Consensus and Democracy**
The second point recognises that the signals communicated through the ballot box and other democratic process to guide "collective" spending decisions by government, will get seriously short-circuited by any deviation from full democracy. Unfortunately, there are still many examples of developing country situations where democracy is either non-existent or seriously flawed. The UNDP notes in its *Human Development Report* that 140 of the countries of the world now hold multiparty elections. Although this is historically unprecedented and a significant sign of democracy gaining ground, only 82 countries, accounting for 57% of the world's people, are "truly" democratic. In all other cases (more than 120 countries) various types of autocratic, including military regimes exercise undue influence over spending decisions[16]. In other countries various shades of flawed democracy hold sway: well-conducted

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[16] The UNDP also notes that since 1980, 81 countries have taken significant steps towards democracy

elections but with few effective checks and balances on the exercise of power by those who win those elections. In many of these cases the collective spending by government is more likely to favour narrow elites of family, friends or ethnic clans than the general good of the population at large - as it could be expressed, at least in principle, through democratic processes.

**The Implications**
The first aspect of this problem (limited tax capacity) is resolved by development itself and by the rising incomes that follow – as this occurs we would expect the collective choices about public spending in poor countries to have increasingly more in common with those same choices in the richer countries: for example, India and China as they become more fully developed will likely align itself more with the climate change and other "public-good" priorities of countries such as Britain: there was evidence of this at the Paris summit on climate change at the end of 2015 But, while large income gaps persist, we must expect collective spending choices even in truly democratic poor countries to diverge from those in richer countries.

The second problem could be resolved more quickly – it needs true democratic processes to replace autocratic ones. Box 2.8 provides some ideas of the mechanisms through which a democratic system is likely to alter the nature of a country's economic transformation over time.

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**Box 2.8: Some Origins and Attributes of Democracy**

Political development in most countries is intrinsically linked to their patterns of economic and social change. When autocratic European rulers of medieval and earlier periods needed tax revenue to pay for wars, they needed some sort of agreement mainly with a small elite class of landowners. However, as development occurred through industrialisation, the wealth that was formerly concentrated narrowly on land-owning aristocracies started to be shared more widely (if not fairly). In today's developed countries this typically led to a gradual empowerment of the working class poor and from there to their greater education. The increasingly wider sharing of both material wealth and intellectual wealth (education) meant that ruling groups needed increasingly to pay some regard to a widening circle of influences when they were raising taxes or spending. This led to more responsive government and to patterns of spending more likely to reflect the needs of the public at large rather than the elites.

But individuals in today's developed economies do not act alone in the use of their potential influence over government. Over many decades, a "civil-society" emerged in the form of groups of people able to articulate and lobby for the legitimate needs of key interest groups and sections of society. As such civil society today is an influencing element that intermediates between individuals and families on the one hand and the state on the other. Modern democracies are critically dependent on an effective civil society. But that civil society in turn is inherently reflective of the economic structures and changes that have extended democratic influence over many years.

In many developing countries, traditional society in the form of clans, tribes, or regional groupings still hold sway. These arrangements have evolved over many years to provide mutual support against a typically very threatening economic and physical situation facing most families. National governments often relate to these traditional arrangements in only tenuous ways if at all. As the major economic transformations described above have taken hold, there is a gradual widening of access to both physical and human wealth (education). This in turn will begin to expose the governments of developing countries to the same wider challenges to their rights to tax and spend that they encountered in Western Europe and the USA more than a century ago. As this occurs – where it does - a broader consensus about the best way to tax and spend will start to hold sway and more responsive government will be the result.

Critically this logic suggests that real democracy will be difficult to impose on societies where the economic transformation is failing to occur and where wealth and influence remains excessively concentrated on small elites. So we may need to wait for a degree of "development" before we see democracy as the global norm.

Why the reader might ask is this an issue that needs to detain us in a book on the **economics** of development? The answer is exactly parallel to our earlier comments on the subject of inequality. Once it is recognised that demand patterns (including those that are expressed collectively via public goods) are key drivers of the structural changes that are the essence of development, then anything that obstructs the transmission of those demand signals stands in the way of effective development. Severe inequality can do this by shifting a dominant part of total demand to luxury goods that must be imported. Failures of democracy can do this by shifting a large part of public spending to satisfy the needs of elites rather than the democratic wishes of the public (e.g. large armies rather than more primary schools). Less inequality and more democracy can both be interpreted in this way as critical *economic* ingredients of the development story.

## 2.8   Last Words

The ambition of this Chapter has been the relatively modest one of introducing four basic propositions that are central to the successful development of all low-income countries going forward. The presentation of this Chapter has also intentionally stood back from the major controversies in the subject – they will emerge soon enough. This pedagogical device is fully defensible at this early stage. The discussion of these four central propositions has already told us a great deal about why certain facets of the development process are crucial (e.g. labour productivity has to rise and physical labour effort has to be supported by the accumulation of both human and physical capital in order to achieve that rise). It has also shown us how some apparently less central concepts such as equality and democracy can interface with the more obvious drivers of development to promote or to delay economic improvement over time.

But the BB model approach does of course limit the scope of what we can learn. So the bare-bones model has made no attempt to explain why some countries have proved very successful at, for example, gaining access to modern technologies while other have largely failed in this regard, or why some of the successful countries of East Asia have been able to finance their successful development without significant recourse to foreign aid whereas African countries that have become highly dependent on concessional international transfers have performed so much worse. Nor have we yet embraced some of the key issues about the most appropriate ways to organise economic systems and economic policy in order to stimulate successful improvements in people's welfare.

These and other important matters can wait just a bit longer. In the next two chapters we continue to establish the common platform of concepts and facts by examining developing countries from a more empirical perspective.