(1909–1949), his main finding was that only one-eighth of this total increase in labour productivity was due to more capital stock and the reminder seven-eighth was due to TFP. In other words, Solow's results implied that for USA's growth, working *smarter* was more crucial than working *more* (number of people) or working *harder* or longer (more hours per worker) or saving more (leading to more capital stock per worker).

Subsequently, numerous *growth accounting* exercises have been frequently conducted for different countries, generally focusing on total GDP growth rather than output per person hour. For the period 1948–1972, USA's GDP growth of 4.0% is broken down as follows: growth of 1.2% capital, 1.0% labour and 1.8% TFP, based on estimates from the US Department of Labour. Thus, from 1948 to 1972, output per person hour grew by 3%, of which about two-third was from TFP.

The substantial contribution of TFP to growth is not always the case. Analysing the East Asian miracle, i.e., the rapid rise in the growth and per capita incomes of the ASEAN countries from the 1980s through the mid-1990s, Paul Krugman found that this growth came mostly from the labour input, not from TFP. In his own words, the rapid growth came from "perspiration, rather than inspiration" (*The Myth of Asia's Miracle*, 1994).

By itself, growth accounting decomposition of the past data along the above lines does not provide an estimate of what potential GDP growth is likely to be. However, based on demographic projections and assumptions about productivity increases, the Solow framework provides an analytical basis for making projections of long-run GDP growth, as shown in Table 1.A below. When there is diminishing marginal productivity, as in the Solow model the growth contributions of labour and capital will be less than growth in the respective inputs.

Table 1.A Growth Decomposition and Projections for the USA

	Average Annual Growth 1951–2000	**Projected Average Annual Growth 2001–2011**
Contributions to growth of Potential Output of Nonfarm Business Sector (Percentage Points)		
Potential Hours Worked	1.1	0.8
Capital Input	1.1	1.5
Potential TFP	1.5	1.4
Total Contribution	3.7	3.7

Source: CBO's Method for Estimating Potential Output: An Update, (Congressional Budget Office, 2001)

1.4 AN ALTERNATIVE APPROACH TO AGGREGATE SUPPLY

Like the Harrod-Domar model, the Solow model also implies that increases in savings, and thereby investment and capital stock, will push up growth. However, unlike the Harrod-Domar model, the Solow model is comprehensive, since it takes into account the contribution of all factors: labour, capital stock and technology. Nevertheless, it is formulaic. It is mainly an after the fact decomposition of the growth contributions of different factors. By itself, the Solow model does *not* offer much insight as to the policies leading to economic growth and prosperity.

The alternative new approach discussed in this section is not formulaic. It instead tries to identify the underlying policies that lead to growth. It focuses upon law and order and property rights in general and, more specifically, on the ease of doing business (EDB). Henceforth, this phrase, EDB (ease of doing business) will often be used. This EDB approach can be said to be pioneered by Hernando de Soto, the path breaking Peruvian thinker and social entrepreneur. In his first book *The Other Path* (1989), he argued that the Peruvian economy could grow rapidly if procedures for business could be reduced and streamlined, especially for the informal sector. In this book, de Soto collected information and documented the number of days and the number of procedures that it takes to carry out specific activities, such as registering a business, getting a construction permit, etc.[5]

To categorise his approach and give him credit, it can be called 'Sotonomics,' as distinct from 'Solownomics.' By contrast, what is here called Solownomics can be described as the analysis of growth using the Solow framework, and further the Solow growth model.[6]

At one level, this Sotonomics approach, rooted in classical economics, is mere common sense. The emphasis on property rights and rule of the law is central to the Chicago School of thought and Milton Friedman. It dates back to Adam Smith, the founder of economics as a subject. Well prior to his classic *The Wealth of Nations* in 1776, which documented and analysed the impact of free markets, Adam Smith wrote,

> "Little else is requisite to carry a state to the highest degree of opulence from the lowest barbarism but peace, easy taxes and a tolerable administration of justice; all the rest being brought about by the natural course of things."[7]

The simplest evidence in favour of this approach can be seen by just comparing which countries are poor and which are rich. Countries that have been free-market economies with rule of the law and well-defined private property rights, such as the OECD countries, have high per capita incomes.[8] By contrast, socialist and mixed economies have been poor until recently. Two countries were split up after World War II into free-market and communist regions: East and West Germany in 1945, and North and South Korea in 1954. West Germany prospered relative to the East, and former East German workers would cross the Berlin Wall

[5] In *The Other Path* de Soto outlines the various steps for setting up a minibus company (Pg 149, 2nd edition).

[6] Note that in discussions along Sotovian lines, the terms *institutions* and *governance* are increasingly used to define the broader aspects of the rule of the law, incorporating interaction between the legal system, private individuals and the government.

[7] In his lectures on Jurisprudence, Smith stated that the very purpose of Government was to "give each one the secure and peaceable possession of his own property." These citations from Smith are from Irwin (2014). The purpose of government was not to raise growth.

[8] OECD stands for Organisation for Economic Cooperation and Development. Earlier it comprised advanced economies: largely European, but also USA, Canada and Japan, etc. Entrants to OECD after 2010 are Israel, Chile, Estonia and Slovenia. It has over 30 members now.

to enter West Germany until the Berlin Wall came down and they were unified in 1989. South Korea has developed enormously relative to communist North Korea which has had famines even in recent decades.

The watershed year for India was 1991, when it liberalised its heavily controlled mixed economy. After that, the ease of doing business went up sharply, and so did the GDP growth after an initial crisis period of a few years. From 1970 to 1991, the growth averaged 4.3%, while from 1992 to 2013 it averaged 6.6%. Similarly, growth surged for other emerging economies that adopted free-market policies from the late 1980s onwards.

This section is about how rule of law and EDB affect growth. More specifically, how can a robust rule of law and an improved EDB affect the GDP growth contributions in the Solow framework of total factor productivity (TFP), labour and capital respectively, and of the choice of technique?

First, with regard to TFP, the property rights approach implies that implementing stringent Intellectual Property Right (IPR) laws and patent protection will facilitate innovation and new products and processes. The Indian pharmaceutical and software industries have not been able to innovate as much as in, say, USA due to lack of stringent patent laws to protect them.[9]

Second, with regard to labour supply (not just wage labour but more so self-employed persons and entrepreneurs), it is obvious that individuals have incentives to work harder and produce more when they are guaranteed 'the fruits of their labour,' to use a classic phrase. This is a very obvious phenomenon, but still needs to be stressed. Where there is risk of expropriation of property or income by the state or extortion by gangs, the labour supply, especially for entrepreneurs, will not be forthcoming. When the rich may get kidnapped, there is not much incentive to try to become rich. This is the case in many poorer economies, such as de Soto's native country, Peru, in Latin America, a region with a long history of violence and a lack of law and order. If tax rates are too high, that is also likely to reduce labour supply.

Third, let us consider capital stock. In his second book, *The Mystery of Capital: Why Capitalism Triumphs in the West And Fails Everywhere Else*, de Soto (2000) goes above the standard rule of the law considerations to emphasise, and explain, why clear title to land and real estate (*Khatha* in Hindi) is vital for capital accumulation.[10] Mapping areas and creating land records is very important.

Further, what seems to be a trivial factor—the existence of *postal addresses*—is crucial for economic growth. Such addresses may not be available in urban slums and rural areas, but are necessary for metered connections of water and electricity. Metering will ensure that users can be accurately billed for payment, and connections shut-off for non-payment. Merely setting electricity and water prices at commercially viable levels without

[9] The US Chamber of Commerce reports on Intellectual Property Index, in February 2016, ranked India as second from last.

[10] To cite from the *World Development Report 2005* in its Chapter 3, overview page 2, "farmers in Thailand with secure rights invested so much more in their land that their output was 14 to 25% higher than those working *untitled land* of the same quality."

subsidies, i.e., the standard World Bank recommendation for decades of 'get the prices right' is not enough. The *legal infrastructure* to enforce payment is far more crucial.[11]

With regard to raising saving to finance development projects, the existence of bank accounts will facilitate risk-free savings, unlike say gold, which can be stolen. Banks will advance loans to those who can use their property as a collateral, i.e., those who have clear title. Identification tied to payment systems, such as America's Social Security card, and e-governance initiatives, such as the Aadhar card in India, will facilitate more transactions and exchange, and thereby raise growth.

This Sotovian approach is vastly different from the conventional approach, in which raising the savings rate was seen as the *critical* condition for growth. In a classic paper from orthodox development economics, Arthur Lewis (1954) (who was later awarded the Nobel Prize for this assertion!) had stated,

> "The central problem in the theory of economic development is to understand the process by which a community which was previously saving and investing 4 or 5% of its national income or less, converts itself into an economy where voluntary saving is running at about 12 to 15% of national income or more."

In terms of the Harrod-Domar formula, the growth rate can be tripled by raising the savings rate from 5 to 15%. But there is no sound policy recommendation as to how this can happen. From a Sotovian perspective, when there is clear title to land, the higher savings needed to finance capital accumulation will somehow be forthcoming.[12] There is no need to offer special fiscal incentives to attract foreign capital. The higher savings will show up endogenously in the formula as the variable leading to higher growth.[13]

1.5 THE EASE OF DOING BUSINESS SURVEY

Following de Soto's lead, the World Bank started measuring the EDB. Its 2004 publication, *Doing Business*, extended to 145 countries what it called de Soto's 'time and motion studies' for Peru. That has evolved into a full-fledged, wide-ranging survey of different countries, now called the Ease of Doing Business Survey, or EDB Survey. The number of days and procedures for the following activities are separately recorded for: (i) starting a business, (ii) dealing with construction permits, (iii) getting electricity, (iv) registering a property, (v) paying taxes, and (vi) enforcing contracts. A reduction in the number of days and/or number of procedures obviously increases the EDB and pushes up the GDP growth.

[11] The book review of the Mystery of Capital (Moorthy, 2002) discusses how crucial postal addresses are for economic development. Even prior to the publication of Mystery of Capital, I had written, "merely attracting foreign capital will not ensure more infrastructure. Without the ability to enforce payment for say, electricity, there is no effective demand. The term transmission and distribution (T&D) losses in electricity has been jokingly referred to as "Theft and Dacoity" losses, see Moorthy (1998). In his book, India's Turn: Understanding the Economic Transformation, Arvind Subramanian (2008, Pg. 116) provides data on T&D losses in the power sector for a few emerging economies, among which India has among the highest losses.

[12] For a discussion of impact of Sotovian policies versus tax concessions on savings, and the associated policy recommendation of cash bonuses for opening bank accounts for the poor, see Moorthy (2001). The *Jan Dhan* scheme is a huge push to open bank accounts in India in 2015.

[13] This entire Section 1.4 draws heavily upon Appendix II, "Law and Order versus Savings as Determinants of Growth" from Moorthy (2001).