Introduction: economies were born where education and

Business, Industries

Introduction: Oneof the basic objectives of economics is to provide welfare to people mostefficiently. Human capital can be defined as the skills, knowledge and otherintangible assets which can be used to produce some economic value. A highnumber of researchers have revealed that human capital plays a big role in economicgrowth. Mincer (1958) first theorized human capital as an important proponent ofeconomic growth, as it raises output. This theory was used as a basis forfuture studies on economic growth. Mankiew et al.

(1992) utilize secondaryeducation enrollments. Barro and Lee (1993) and Bosworth et al. (1995) have usedaverage years of schooling. Education was viewed as the core factor of humancapital by macroeconomists, while health held equal stature according tomicroeconomists as labour needs to be healthy to work efficiently. (Romer, 1986, 1990; Lucas, 1988; Rebelo, 1991) emphasized that human capital formationwas a major factor which explains difference in growth performance of developedand under-developed countries. Classicaltheory suggests that labor productivity is an exogenous variable which dependsupon workforce in terms of capital and technological advances. It fails tocapture the potential growth of productivity due to education, health ortraining. Studies on theory of market value have shown that there is aninfluence of intangible assets, such as R&D, intellectual properties ofcompanies and patents which lead ultimately to economic growth.

Companies thatare deemed as the spine of the biggest economies were born where education andhealth are of top quantity and quality. This has been

observed throughout thepast two decades, as companies raised huge amount of assets through developingtechnologies, which came through an incubating environment. Companies such asApple, Google, Microsoft, have created industries and made leaps intechnological advances, enjoy assets worth more than most countries. Thisinflux of money then leads to higher economic growth of their countries. Teslafor a more recent example, have completely changed the automotive industry bydeveloping fully electric production cars. This technology for mass productionwas deemed impossible for a decade into the future. The same can be said forSpaceX.

Theincredible economic growth of countries with very few natural resources, thelikes of which relied on importing their input materials. Japan, Taiwan andother countries of the sort relied heavily on their human capital formation andbore the fruit, as they attained high growth rate and therefore greaterwelfare. USA, Germany, Japan have had persistent high economic growth over a100 years, and if growth of land and physical capital is taken into accountthere should’ve been a rapid decrease in returns and eventually no growth. Thepersistence can therefore be credited to technological advancement, which camethrough formation of human capital. This scientific advancement gives highvalue to education, training and other factors leading to it. Theeconomic effects of population health can be seen both at the individual andmacroeconomic levels. There is consensus of health’s effect on economic growth, however the magnitude of the effect is the area where there exists a differenceof opinions. Developingcountries have more

human capital as compared to physical capital, so moreemphasis should be given to developing labor quality.

Pakistan has a very largelabor population but had very low spending on health and education throughoutits history. In the past decade health expenditure revolved around . 9% whileeducation averaged 2. 4%. Comparing two neighboring countries Iran and India, Pakistan ranks below both on life expectancy and average years of schooling. Although it ranked closely on life expectancy at birth with India but trailsboth countries on education and health by some margin according to the humandevelopment index. It is currently ranked at 147 while India and Iran rank at131 and 69 respectively.

Healthand Education indicators alone fail to capture development of capabilities andskills of labor, so a broader measure is needed to study the effect of humancapital on economic growth. Variables such as unemployment, protection ofproperty rights, social security affect development of human capital. Unemploymentgenerates a negative effect on human capital, as there is lack of area to apply/developskill and knowledge acquired by the individual. Social security has the sameeffect as people are demotivated to work/study in institutions due toterrorism/crime. This study tries to capture the effect of these variables oneconomic growth of Pakistan.

Literaturereview: Theterm human capital was first coined by (Mincer, 1958), where he viewed laborforce as factor which can be invested in to increase

output. He defined humancapital as “ the stock of knowledge, habits, social and personality attributes, including creativity, embodied in the ability to perform labor so as to produceeconomic value”. Theeffect of human capital on economic growth is inconsistent throughoutliterature, as some papers show a strong significant impact while other papersreport a negative relation. In this section, a review of previous literaturewill be cited and cause of inconsistency will be adressed. Inthe 1960s, neoclassical model was used for the growth model as developed by(Sollow, 1956). One feature of this model is the convergence property, whichmeans that lower the real per capita GDP, higher the predicted growth rate.

Ifall economies were the same and which is not the case, then convergence wouldapply absolutely, because all economies differ in various ways, thenconvergence would have a conditional effect. Meaning that growth rate tends tobe high if an economy begins below its own target position. Convergenceproperty is conditional because steady state levels and output per workerdepend on population growth, saving rates, government policies, protection ofproperty rights, so on and so forth. This property is derived from thediminishing returns to capital in the neoclassical model. Low capital perworker would lead to higher rate of returns and thus higher growth rate. Theconcept of capital in the neoclassical model can be broadened to include humancapital, as education, experience and health play a role in it (Lucas, 1988),(Mulligan and Sala-i-Martin, 1993), (Barro and Sala-i-Martin, 1995).

A countrythat tends to have a high labor to capital ratio tends to grow more rapidly, because physical capital is much easier to manage and can be

allocatedefficiently in a short time. (Ben Habib and Spiegel, 1994) suggest that if theGDP depends more on a countries initial level of per capita output then thestarting amount of human capital is high. Howeverthis rate must diminish as it reaches its steady state. But the long run dataof countries show that a steady positive growth sustains over a century or more.

Neo classical theory then fails to predict long run per capita growth. One exogenousvariable in the model which successfully predicts the long run growth is rateof technological progress. Endogenousgrowth theory thus tries to fill the gap by including technological progress. These models include private incentives to discover new products or productionmethods. These incentives can be encouraged by patent protection or governmentsubsidies or direct government involvement. This incorporated theory wasinitialized by (Romer, 1987, 1990) and includes contributions by (Grossman andHelpman, 1991) and (Agion and Howitt, 1992). (Becker, 1962) also popularized investment in human capital. He studied the change inincome due to change in investment cost and rate of returns.

He emphasized toinvest in education, healthcare and training. (Schultz, 1971) also worked alongthese lines and found causal relationship in education and healthcare and founda positive effect of these variables on economic growth. Earlycross-country studies find a significant impact of human capital on economicgrowth. (Rosenzweig, 1990) reported out that major determinant of high growth rateof developed countries and poor growth rate of developing countries isdifference in the human capital growth.

(Sachs and Werner, 1997) also reporteda positive relation between healthcare and growth but found that increase inhealth expenditure increases economic growth but a decreasing rate. (Steward etal, 1998) studied cross country data from 1970-1992 between human developmentand economic growth and found a strong two-way causation. However, strength ofthe relationship from economic growth to human development depends on femaleeducation and social services expenditure whereas income distribution andinvestment rate determine the strength of relationship from human developmentto economic growth. (Lucas, 1993): The main engine of growth is the accumulation of human capital –or knowledge – and the main source of differences in living standards amongnations is a difference in human capital. Physical capital plays an essentialbut decidedly subsidiary role.

Arapid decrease in mortality rates lead to the population explosion in the 19thand 20th century. Increased survival rate and decrease in mortalityled to a population boom, the most significant increase was found in infantmortality rate so there was a large increase in young people. In the long run, reductions in infant mortality lead to a fall in desired fertility, creating aone? timebaby? boomcohort. As this large cohort ages, the resultant changes in population agestructure can have significant economic implications. Population growth is thedifference between birth and death rates and the global population explosion inthe twentieth century is attributable to improvements in health and fallingdeath rates.

Health advancement in developing countries lead to an initialincrease in the number of children. Reduced infant mortality, increased numbersof surviving children, and rising wages for women can lower desired fertility (Schultz, 1997) which leads to smaller cohorts of children in future generations. Thisprocess creates a “ baby boom” generation that is larger than both preceding andsucceeding cohorts. Subsequent health improvements tend primarily to affect theelderly, reducing old? agemortality and lengthening the lifespan. In many theoretical models a populationexplosion reduces income per capita by putting pressure on scarce resources andby diluting the capital–labor ratio. In these models population declines spureconomic growth in per capita terms.

For example, the very high death rates anddecline in population due to the Black Death in fourteenth century Europeappear to have caused a shortage of labor, leading to a rise in wages and thebreakdown of the feudal labor system (Herlihy, 1997). However, in modern populationthere appears to be little connection between overall population growth andeconomic growth; indeed the twentieth century saw both a population explosionand substantial rises in income levels. Proxyof the monetary value of life (the willingness to pay to avoid a small risk ofdeath) are often very large (Viscusi and Aldy, 2003).

We can use theseestimates of the value of life to compare the welfare improvements that havecome about due to improvements in population health and the improvements due toeconomic growth and higher incomes. We can measure the money value of healthimprovements by the amount of

money people, would be willing to pay to forgothese improvements. For example we survey people living with today’s income, health, and life expectancy as to what level of income would be required forthem to accept living with average life expectancy and health a century ago. The income gain they would require is a measure of value of health andlongevity in monetary terms, which can be very large.

Such comparisons suggestthat in many countries the value of health gains has been comparable to, or haseven surpassed, the value of income gains (Nordhaus, 2003). In addition, although income gaps between countries have been very persistent over the last50 years, there has been large? scaleconvergence in life expectancy, suggesting that overall world welfare levelshave been converging (Bourguignon and Morrisson, 2002; Becker, Philipson andSoares, 2005). The large monetary value of health gains gives a rationale forinvesting in health quite apart from its instrumental value as an input intoproductivity. Althoughpopulation health measures are highly predictive of future economic growth, there is a debate about how to interpret the link. The health effect could beinterpreted as the macroeconomic counterpart of the worker productivity effectfound in individuals. However (Acemoglu, Johnson and Robinson, 2003) argue thathealth differences are not large enough to account for much of the cross? country difference in incomes, andthat the variations in political, economic, and social institutions are morecentral factors.

They argue that health does not have a direct effect ongrowth, but serves in growthregressions as a proxy for the pattern of European settlement, which

was more successfulin countries with a low burden of infectious disease. One way toaddress the issue is to see how the effect of health caries with the inclusionof other variables in the growth regression that may account for potentialomitted variables. (Sala? i? Martin, Doppelhofer, and Miller, 2004) test 67 potential variables that might affect economic growth. Theystart by putting an equal probability ofaffecting growth on each variable. They run possible models of a particular size (for example, 5, 7, 9, and 11explanatory variables) and perform Bayesianupdating on the results to find the find the posterior probability of each variable being included.

If the model hasonly five explanatory variables, they select theEast Asia dummy, primary schooling, price ofinvestment goods, initial income, and fractional tropical area as the mostlikely explanations of economic growth. Howeverextending the model to include nine explanatoryvariables adds life expectancy, malaria prevalence, the fraction of the population Confucian, and the populationdensity in coastal areas, indicates that the predictive power of health foreconomic growth is robust to the specificationof the growth regression. Acemogluand Johnson (2007) raise a second objection to the argument that health affects economic growth. They instrument health usingthe initial disease burden and worldwidetechnological progress in disease? specificinterventions.

They find that instrumented health doesnot predict the level of income. This result issubject to the criticism of lag times; it may take time for health technologies to be implemented and time for the healthimprovements in children to work their way intoproductivity improvements. However, the

major innovationin the paper is the argument that health improvements increase longevity and spur population growth and this populationgrowth puts a strain on other factors, causingincome per capita to fall. Thereare many issues which could lead to inconsistent estimation of health's effecton economic growth. Firstly and the most major problem, is that health ismeasured in different ways, different proxies are used to measure health. Secondly there is a problem of inconsistent data, this is because there is evidenceof adult cognition and production efficiency affected by their childhoodhealth.

Thirdly there is a case for causality, so it is possible that incomeaffects health and health affects income so it becomes difficult to measure. Soa solution to this measure difference is to address the root cause fordifference in adult health indicators. There is consistence in the health datacollected about children which very strongly influences adult health. This was seenby (Case, Fertig, and Paxson, 2005) who used education and parental influences toshow childhood health has a strong impact on adult health.

(Schultz, 2002) regressesadult height with childhood health and nutrition to argue that each centimetergain in height due to improved inputs as a child in Ghana and Brazil leads to awage increase of between 8 and 10 percent. Anothersolution could be to derive data ourselves using quasi-experiments. (Thomas andFrankenberg, 2002) advocated this approach. (Bleakley, 2003) studied theeffects of the eradication of hookworm and malaria in the United States in the1910s and 1920s.

Controlling for normal wage gains in areas that were notinfected, showed that persons who were born after eradication had higher wagesas compared to persons born before eradication. However the rate of returnswhich can be achieved due to investment in health is not addressed. (Barro, 2001) studied education's effect and found a strong impact. He reported thathigh ratio of human capital tends to generate higher growth through twochannels, firstly through more absorption of physical capital due to lowerlabor to capital ratio and secondly due to efficient adjustment of physicalcapital.

Directeffects of education such as increased individual wages follow from the assumptionthat education results in learning, which increases a worker's productivity. Ifworkers are paid the value of their marginal product, it means thatbetter-educated workers should earn higher wages. Inaddition to the direct effects of education, a number of indirect effects have emergedin the literature. (Michaelowa, 2000) found a positive effect of amother's schooling on her children's health in developing countries.

Healthierchildren may be more productive than unhealthy children and the result may behigher performance in school. Similarly, better-educated parents tend to makemore informed decisions with regard to family planning – the result beingsmaller family sizes. Smaller family size enables more parental involvement ineach child's education (as parents' time is scarce). Increased parental involvementin a child's education may enable the child to perform better in school andencourage him or her to pursue additional years of education. An individual'schoice to pursue further education may improve the earnings of his or herneighbors. (Michaelowaand Katharina, 2000) offers

the example of an educated farmer who implementsnew agricultural techniques. Neighbors may observe the new methods used by theeducated farmer and imitate them.

Learning through observation is a mechanism bywhich such educational benefits may be spread within a community.