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Dynamic Links between the Economy and Human Development

Gustav Ranis and Frances Stewart

Abstract

This paper empirically confirms the significance of various links in each of two chains over time: from economic growth (EG) to human development (HD), including EG itself, income distribution, the social expenditure ratio and female education; from HD to EG, including HD itself, along with the investment ratio. Our most important conclusion concerns sequencing over time. EG, which is an important input into HD improvement, is itself not sustainable without such improvement, either prior or simultaneous. Therefore, traditional policy advice, which argues that HD improvements must wait until EG expansion makes it affordable, is likely to be in error.

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Keywords: human development, economic growth, comparative country studies.

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Dynamic Links between the Economy and Human Development

Gustav Ranis and *Frances Stewart*[1]

Human development (HD) is increasingly viewed as the ultimate objective of development in place of economic growth (EG). Yet, the links between HD and EG remain of critical importance since EG would appear to be a foremost contributor to sustained progress in HD. Moreover, not only are improvements in HD the fundamental development goal, but HD is itself an important contributor to EG over time. Hence, it is important to explore the two-way links between HD and EG. The aim of this paper is to examine these relationships and to draw policy implications from the analysis.

HD has been defined as 'a process of enlarging people's choices' (UNDP, 1990: 10). This definition is, of course, very broad, and includes non-material aspects such as the many dimensions of political, cultural and social freedoms. In this paper, however, we shall take a reductionist approach and focus exclusively on two important aspects—people's health and their education.

Clearly, there exist strong connections between EG and HD. On the one hand, EG provides the resources to permit sustained improvements in HD. On the other, HD improvements raise the capacities of economic agents who make the critical contributions to EG. Each of these relationships has often been acknowledged separately—for example, the way in which EG affects HD forms part of the basic needs literature, while the impact of improved labour quality on economic growth has been widely explored in the human capital literature. Yet, the two strands have seldom been combined within one dynamic analytical framework. It is important to understand the full implications of this two-way linkage in terms of both analysis and policy. The two-way linkage can be explored analytically and through empirical investigation of the chains and their links.

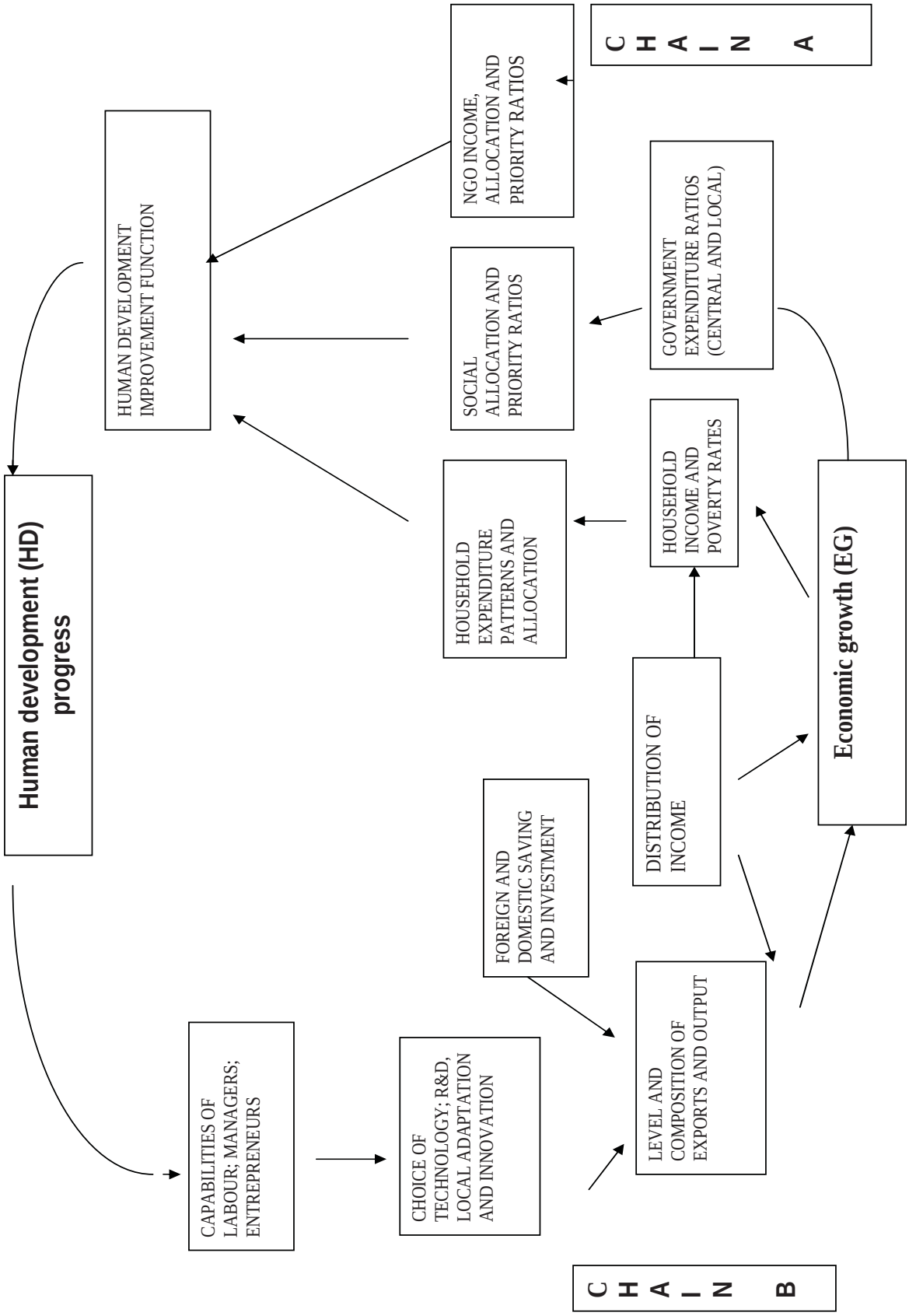
In this paper, we first identify the major links which make up the two chains between EG and HD. We then present some empirical cross-country evidence on these links. The third section presents a typology of country cases, some representing the mutual reinforcement between HD and EG and some demonstrating asymmetric performance; this is followed by an investigation of the movement of countries from one situation to another over time. The final section briefly reflects on the implications for policy.

The two chains

We concentrate on two causal chains, one leading from EG to HD (Chain A), the other from HD to EG (Chain B). The two chains are pictured in figure 1.

1 This paper draws heavily on previous work by the authors and others: see Ranis, Stewart and Ramirez 2000; Ranis and Stewart 2000; Boozer and others 2003. We are grateful for comments on an earlier draft from José Antonio Ocampo and discussants at the New York meeting in March 2005.

Figure 1:


Human development (HD) progress
HUMAN DEVELOPMENT IMPROVEMENT FUNCTION
NGO INCOME, ALLOCATION AND PRIORITY RATIOS
CHAIN A
SOCIAL ALLOCATION AND PRIORITY RATIOS
GOVERNMENT EXPENDITURE RATIOS (CENTRAL AND LOCAL)
HOUSEHOLD EXPENDITURE PATTERNS AND ALLOCATION
HOUSEHOLD INCOME AND POVERTY RATES
Economic growth (EG)
DISTRIBUTION OF INCOME
FOREIGN AND DOMESTIC SAVING AND INVESTMENT
CAPABILITIES OF LABOUR; MANAGERS; ENTREPRENEURS
CHOICE OF TECHNOLOGY; R&D, LOCAL ADAPTATION AND INNOVATION
LEVEL AND COMPOSITION OF EXPORTS AND OUTPUT
CHAIN B

Chain A: from EG to HD

Gross national product (GNP) contributes to HD through household and government activity, community organizations and non-governmental organizations (NGOs). The same level of GNP can lead to very different HD performances depending on the allocation of GNP to various groups and to distribution within each category.

The propensity of households to spend their income on items which contribute most directly to the promotion of HD, e.g., food, potable water, education and health, varies depending on the level and distribution of income across households, as well as on who controls the allocation of expenditure within households. In general, as the incomes of the poor rise, the proportion of income spent on HD increases (Behrman, 1993, 1996). This means that higher and more equally distributed growth is likely to enhance HD expenditure, as is shown by much empirical evidence. For example, one estimate suggests that if the distribution of income in Brazil was as equal as that in Malaysia, school enrolments among poor children would be 40 per cent higher (Birdsall, Ross and Sabot, 1995). There is also substantial evidence that greater female control over household expenditure increases HD allocations. In Côte d'Ivoire, for instance, an increase in women's share of household cash income was associated with significantly higher spending on food and reduced spending on alcohol and tobacco (Hoddinott and Haddad, 1991).

Turning to government—both central and local—the allocation of resources for improving HD is a function of total public sector expenditure, how much of that expenditure flows to the HD sectors, and the way in which it is allocated within these sectors. This can be expressed in the form of three ratios (UNDP, 1991)—the public expenditure ratio, defined as the proportion of GNP spent by the various levels of government; the social allocation ratio, defined as the proportion of total government expenditure devoted to the HD sectors; and finally, the priority ratio, defined as the proportion of total HD sector expenditure allocated to priorities within these sectors. To clarify, within HD sectors, those expenditures which are clearly much more productive than others in terms of achieving advances in HD are defined as 'priorities': for example, basic education, especially at an early stage of development, is generally recognized to have had a larger impact on HD than tertiary education. The precise definition of what constitutes a priority will, however, inevitably vary according to a country's stage of development, rendering this third ratio more arbitrary than the other two. Very large variations in each of these ratios exist across countries, which means that the same level of GNP may be associated with very different levels of government spending on HD priorities (UNDP, 1991: chap. 3, 1996: chap. 3). There is evidence that local government, ceteris paribus, tends to favour HD allocations relative to central government (see Klugman, 1994; Habibi and others, 2003; Ranis and Stewart, 1994).

The significance of public expenditure choices for improving HD is illustrated by a comparison between Kenya and Malawi. In the 1980s, a similar proportion of national income went to public expenditure (27 per cent in Kenya; 30 per cent in Malawi), but Kenya had a significantly higher social allocation ratio (47 per cent, compared to 35 per cent) and priority ratio (34 per cent, compared to 14 per cent), so that the proportion of gross domestic product (GDP) going directly to HD-improving priorities in Kenya was over three times that of Malawi (5.1 per cent, compared to 1.5 per cent) (UNDP, 1996: 71).[2]

Finally, NGO or other civil society activity is typically heavily oriented towards HD objectives (e.g., projects generating income for the poor and spending on schools, nutrition and health). Although in

2 These calculations adopt a narrow definition of social priority expenditure, including pre-primary and first level education plus primary health care only.

most contexts, NGOs play a supplemental or even marginal role in a few countries (e.g., the Bangladesh Rural Advancement Committee (BRAC) and the 'Comedores Populares' in Peru), they appear to represent a major source of HD enhancement (Riddell and others, 1995).

A further important link in Chain A is the effectiveness of these expenditures in raising HD levels, represented here by the 'Human Development Improvement Function' (HDIF). An example of one important input into this production function is female education, which abundant empirical evidence has shown to improve infant survival and nutrition (Rosenzweig and Schultz, 1982; Behrman and Wolfe, 1987a, 1987b; Barrera, 1990). Other research, on Ghana, has demonstrated that, in rural areas, the provision of basic health services improves child health and increases survival significantly, while the evidence is less clear for urban services (Lavy and others, 1995).

It is evident from this discussion of the various links in the EG-HD chain that, in general, we expect important causal connections to exist between the economy and HD achievements, but that these connections are *not automatic*: the strength of the links in Chain A varies in line with a large range of factors, including the structure of the economy, the distribution of income and the policy choices made.

Chain B: From HD to EG

Turning to Chain B, from HD to EG, in addition to being ends in themselves, higher levels of HD affect the economy by enhancing people's capacities and, consequently, their creativity and productivity. Ample evidence suggests that as people become healthier, better nourished and educated, they contribute more to economic growth through higher labour productivity, improved technology, attracting more foreign capital, and higher exports. This, of course, does not detract from the intrinsic value of improving the lives of those who cannot find employment because of disability or age, for example.

Numerous studies indicate that increases in earnings are associated with additional years of education, with the rate of return varying with the level of education (Behrman, 1990a, 1990b, 1990c, 1995a; Behrman and Deolalikar, 1988; King and Hill, 1993; Psacharopolous, 1994; Schultz, 1988, 1993a, 1993b; Strauss and Thomas, 1995). Analysis of the clothing and engineering industries in Sri Lanka showed that the skill and education levels of workers and entrepreneurs were positively related to the rate of technical change in the firm (Deraniyagala, 1995). Moreover, in agriculture, evidence suggests positive effects of education on productivity among farmers using modern technologies (Schultz, 1975; Welch, 1970; Rosenzweig, 1995; Foster and Rosenzweig, 1994; Behrman, Rosenzweig and Vashishtha, 1995). In Thailand, farmers with four or more years of schooling were three times more likely to adopt fertilizer and other modern inputs than less educated farmers (Birdsall, 1993).

These effects are embodied in growth theories. The Solow model views human capital as an important input, while the 'new growth theories' endogenize technical progress, incorporating education as well as research and development (R&D). According to Lucas (1988), for example, the higher the level of education of the workforce, the higher the overall productivity of capital because the more educated are more likely to innovate, thereby affecting everyone's productivity. A complementary view is that technical progress depends on the level of R&D in the economy. Here again, education plays a key role, both in contributing to R&D and via interactive learning (Roemer, 1990; Grossman and Helpman, 1991).

There is also a positive feedback from improved education to greater income equality. As education becomes more broadly based, people with a low income are better able to seek out economic oppor-

tunities which improve income distribution over time. For example, a study of the relationship between schooling, income inequality and poverty in eighteen countries of Latin America in the 1980s concluded that 'clearly education is the variable with the strongest impact on income equality' (Psacharopolous and others, 1992: 48).[3] Improved income distribution, in turn, has been found to be positively associated with EG (Alesina and Rodrik, 1994; Alesina and Perotti, 1994; Persson and Tabellini, 1994; Birdsall, Ross and Sabot, 1995), although the empirical basis for this appears rather fragile.[4]

Improved health and nutrition have also been shown to have direct effects on labour productivity, especially among poorer individuals (Behrman, 1993, 1996). For example, calorie increases have been widely shown to raise productivity, including among farmers in Sierra Leone, sugar cane workers in Guatemala and road construction workers in Kenya (Cornia and Stewart, 1995; Strauss, 1986; Immink and Viteri, 1981; Wolgemuth and others, 1982). A longitudinal study of a sample of children in Chile concluded that providing nutritional supplements to children to prevent malnutrition would generate benefits in terms of additional productivity six to eight times the cost of the intervention (Selowsky and Taylor, 1973). At the aggregate level also, health has been shown to be an important input into EG (Bloom, Canning and Sevilla, 2004).

Education and health alone, of course, cannot transform an economy. The quantity and quality of investment, domestic and foreign, together with the overall policy environment, form other important determinants of economic performance. Yet, the level of human development has a bearing on these factors too.

As in Chain A, the strength of the various links in Chain B varies considerably, and there is no *automatic* connection between an improved level of HD and increases in per capita GNP. It is not enough to create a larger pool of educated people; there must also exist opportunities for them to be productively employed, or this might simply increase the number of educated unemployed. Other factors which affect the rate of growth, and consequently, the strength of this chain, are the level of investment (supported by both domestic and foreign savings) and the overall policy setting. Higher levels of HD are also relevant here—they attract more foreign direct investment (FDI), induce more exports and contribute to improvements in technology and policy.

Empirical findings on the links in the chains

In previous work, we have explored some of the relationships in the two chains empirically, using data from 69 developing countries, applying ordinary least squares (OLS) methods, though for some variables we have a smaller number of observations because of lack of data (Boozer and others, 2004). Because of the two-way causation, we used lags of the original variables to reduce the simultaneity bias.[5]

For Chain A (see table 1), the variable chosen to measure human development progress was Infant Mortality Shortfall Reduction (IMSR),[6] 1960-2001. This was selected because the infant mortality rate

3 De Gregorio and Lee (1999: Abstract) find that 'education factors—higher attainment and more equal distribution of education—play a significant role in making income distribution more equal'.

4 The growth/inequality nexus has been challenged by Liu, Squire and Zou (1998) who find a negative relationship, while Barro (1999) and Deininger and Olinto (2000) argue that the relationship is non-linear and a positive relationship holds only for poor countries.

5 Lagged values are reasonable candidates as instruments since the correlation between the residuals in the two periods analysed is not substantial.

6 Shortfall reduction is measured relative to ceiling levels of countries at current maximum achievement, i.e., 3/1000 for infant mortality; and 85 years of age for life expectancy.

Table 1:
Chain A regressions: from EG to change in HD
(Measure of change in HD is IMSR, 1960-2001)

Variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
GDP per capita, 1960 x 10^6	4.84 (1.45)	4.60 (1.33)	4.63 (1.33)	30.8 (1.21)	22.8 (1.21)	3.65 (1.14)	-7.13 (0.32)	-4.61 (0.21)
GDP per capita growth rate, 1960-1980 x 10	1.06[b] (2.07)	0.99[a] (1.85)	1.01[a] (1.85)	1.30 (1.64)	0.59 (0.94)	1.09[a] (1.97)	-1.31 (1.58)	-1.22 (1.50)
Gross primary enrolment rate, 1960 x 1000	1.08[a] (1.77)	-	0.60 (0.29)	-	-	-	-	0.86 (1.06)
Gross female primary enrolment rate, 1960 x 1000	-	1.04[a] (1.73)	0.50 (0.26)	2.76[c] (3.14)	1.07 (1.46)	2.21[c] (3.24)	0.96 (1.31)	-
Gini coefficient, average over 1960-2001 x 1000	-	-	-	-4.89[a] (1.83)	0.20 (0.09)	-	-	-
Poverty headcount, average over 1985-2001 x 1000	-	-	-	-	-	-	3.83[c] (2.93)	-3.73[c] (2.85)
Public expenditure on education (percentage of GDP), 1980-1999 x 100	-	-	-	-	-	1.21[c] (2.80)	-	-
Public expenditure on health (percentage of GNP), 1960 x 100	-	-	-	-	-	6.13[b] (2.65)	-	-
Middle East dummy	0.32[c] (6.02)	0.33[c] (6.08)	0.33[c] (5.70)	-	0.34[c] (4.96)	0.41[c] (4.96)	0.28[c] (4.21)	0.28[c] (4.20)
Asia dummy	0.25[c] (6.01)	0.25[c] (6.12)	0.25[c] (5.84)	-	0.28[c] (5.64)	0.34[c] (7.30)	0.19[c] (3.98)	0.19[c] (3.93)
Latin America dummy	0.24[c] (6.10)	0.24[c] (5.65)	0.24[c] (5.60)	-	0.25[c] (5.15)	0.31[c] (6.86)	0.26[c] (5.02)	0.27[c] (5.29)
Intercept	0.35[c] (10.62)	0.36[c] (12.84)	0.35[c] (8.47)	0.61[c] (5.07)	0.33[c] (3.19)	0.10 (1.56)	0.58[c] (7.20)	0.57[c] (6.52)
Number of observations	67	66	66	55	55	43	49	50
R-squared	0.72	0.72	0.72	0.44	0.73	0.83	0.74	0.74

Notes: Figures in parentheses are absolute t-statistics. Omitted region is Africa.

Note that the gross female primary enrolment rate and ratio of female-to-male primary enrolment rate are highly correlated (0.76).

a indicates significance at the 10% level.
b indicates significance at the 5% level.
c indicates significance at the 1% level.

is relatively accurate in measuring changes over time and is also correlated with other indicators, such as adult literacy and life expectancy. GDP per capita growth proved significant in most runs, as did female primary enrolment rates. Highly significant (at the 5 per cent or 1 per cent level) were social expenditure ratios, specifically public expenditure on health and education as a percentage of GDP. Income distribution, as summarized by the average value of the Gini coefficient between 1960 and 2001, proved significant, and with the expected sign, at the 10 per cent level in one of the runs, while the average poverty headcount during 1985-2001 was highly significant (at the 1 per cent level), and with the expected sign,

whenever included. In other words, for every 1 per cent reduction in the poverty rate, the infant mortality shortfall reduction decreases by 3.8 per cent. HD progress was also positively related to gross female primary enrolment, showing the importance of female literacy in the HDIF. We did not have data to investigate the impact of the female contribution to household income. The regional dummies proved almost universally highly significant. Had we left them out, as indeed we did in one run, other variables would probably have gained in significance; however, given their role of capturing omitted variables (see the difference in the R-squares), we would have been placing undue confidence in intercountry homogeneity among a large array of very different Third World countries.

For Chain B (see table 2), the variable chosen to measure EG was GDP per capita growth during 1960-2001. We also included log GDP per capita 1960 in all equations in order to test for convergence, which was strongly confirmed in virtually all cases. GDP per capita growth was significantly related to HD improvement (at the 5 per cent or 1 per cent level) in virtually all cases, using the literacy rate and literacy shortfall reduction between 1970 and 1980 as indicators of HD. The very same result was obtained when we substituted 1960 life expectancy or life expectancy shortfall reduction between 1960 and 1980 as indicators of the level and progress in human development.

Moving on to the more conventional inputs in this production function, we found the gross domestic investment rate over the entire 1960-2001 period to be highly significant, mostly at the 1 per cent level. The export ratio, a proxy for competitiveness, proved insignificant, however. In future work, an effort should be made to obtain some indicator of technological capability, such as R&D, patenting or FDI inflows, as an input into the production function generating per capita income growth.

As is well known, both economic and political economy arguments have been advanced, linking a more equal distribution of income to higher rates of growth. However, the average Gini coefficient over the 1960-2001 period did not prove significant. Nevertheless, when we substituted the average poverty headcount ratio, the result was surprisingly strong and highly significant at the 1 per cent level (see equation 9).

In summary, in exploring the two chains, we found significantly positive effects of EG on HD and of HD on EG. In other words, our empirical findings confirm the two-way causal connection between EG and HD by way of many, if not all, of those links that data constraints permitted us to consider. For Chain A, in addition to the positive impact of economic growth, HD improvement was larger the higher the social expenditure ratio, the higher female education enrolments, the better the distribution of income and the lower the poverty levels. For Chain B, as well as the positive impact of HD on growth, the relationship between HD and EG was stronger the higher the investment rate.

Our results also indicate that the two chains can deliver good results in a variety of ways by relying on the strength of particular links in the chains, thereby making up for the weakness of other links. For example, a country can achieve good HD progress by good EG, even in the face of an only moderately good distribution of income, as long as poverty rates are falling and the social expenditure ratio is high, as in Malaysia. Other countries have attained good HD progress with poor growth and poor distribution, but with high social expenditure and high female enrolment rates (e.g., Jamaica). In fact, research on individual countries shows that among those countries most successful with HD, each one them had high female/male enrolment ratios and relatively high social allocation ratios (Ranis and Stewart, 2000).

Table 2:
Chain B regressions: from HD to EG
(Measure of EG is GDP per capita growth, 1960-2001)

Variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Log GDP per capita, 1960 x 10	-2.80[c] (3.42)	-2.64[c] (3.04)	-3.32[c] (3.80)	-1.54 (1.62)	-2.33[b] (2.38)	-2.86[c] (3.43)	-2.91[c] (3.66)	-2.63[c] (3.27)	-2.96[c] (3.81)
Literacy rate, 1970-1975 x 100	1.95[c] (4.88)	-	1.29[b] (2.25)	0.98[b] (2.12)	-	-	0.95 (1.61)	-	-
Literacy shortfall reduction, 1970-1980	-	-	-	-	-	-	4.97[b] (2.22)	4.21[c] (2.74)	1.94 (1.53)
Log life expectancy, 1960	-	2.67[c] (4.31)	1.43 (1.59)	-	1.81[c] (2.93)	2.27[c] (3.71)	-	-	-
Life expectancy shortfall reduction, 1960-1980	-	-	-	-	-	2.21[c] (2.71)	-	-	-
Gross domestic investment (percentage of GDP), average over 1960-2001 x 100	-	-	-	5.81[c] (3.71)	5.57[c] (4.36)	-	-	5.04[c] (3.60)	2.80[b] (2.39)
Exports (% of GDP), average over 1960-2001 x 1000	-	-	-	-	-	-	-	3.76 (1.14)	1.80 (0.42)
Gini coefficient, average over 1960-2001 x 1000	-	-	-	-1.61 (0.18)	3.46 (0.41)	-	-	-	-
Poverty headcount, average over 1985-2001 x 1000	-	-	-	-	-	-	-	-	-16.4[c] (4.94)
Middle East dummy	0.65[c] (2.64)	0.17 (0.68)	0.48[a] (1.84)	0.25 (0.80)	0.05 (0.19)	-0.06 (0.25)	0.57[b] (2.40)	0.29 (1.30)	0.21 (1.00)
Asia dummy	0.66[c] (3.41)	0.63[c] (3.06)	0.59[c] (2.95)	0.46[b] (2.25)	0.45[b] (2.33)	0.40[a] (1.86)	0.63[c] (3.36)	0.56[c] (3.37)	0.42[c] (3.14)
Latin America dummy	-0.12 (0.61)	-0.21 (0.94)	-0.22 (1.02)	-0.13 (0.62)	-0.15 (0.77)	-0.30 (1.43)	0.03 (0.13)	0.28 (1.62)	0.36[b] (2.40)
Intercept	1.19[c] (2.71)	-8.18[c] (4.01)	-3.62 (1.18)	-0.14 (0.23)	-6.28[c] (3.07)	-6.89[c] (3.44)	1.19[c] (2.80)	0.40 (0.80)	1.89[c] (3.77)
Number of observations	67	69	67	55	57	69	67	67	50
R-squared	0.52	0.48	0.54	0.64	0.67	0.54	0.56	0.66	0.79

Sources: World Bank, World Development Indicators database (2003) and, on public expenditure on health, Human Development Report (2001).

Notes: Figures in parentheses are absolute t-statistics. For region, the base group is Africa.

Note that the log of life expectancy and the poverty headcount are highly correlated (-0.59) and that the poverty headcount and the gross female primary enrolment rate are correlated (-0.51). Also, the literacy rate and the literacy shortfall reduction are highly correlated (0.83).

a indicates significance at the 10% level.
b indicates significance at the 5% level.
c indicates significance at the 1% level.

Virtuous and vicious cycles and lopsided development

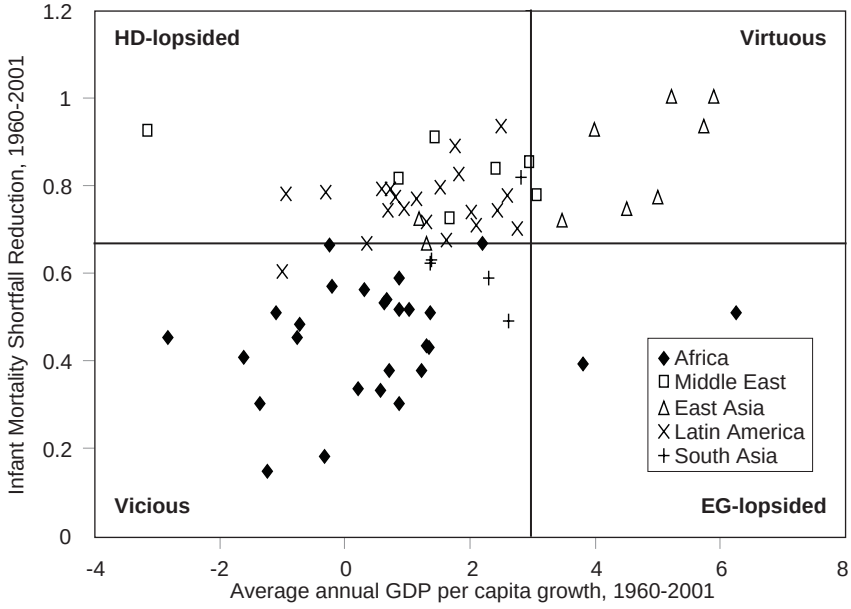
The existence of two chains linking HD and EG is thus strongly supported both by our framework, drawing on micro and macro studies in the literature, and by our own empirical results. This means that an economy may be on a mutually reinforcing upward spiral, with high levels of HD leading to high EG and high EG, in turn, further promoting HD. Conversely, weak HD may result in low EG and, consequently, poor progress towards HD improvement. The strength of the links in the two chains influences the extent of mutual reinforcement between HD and EG in either direction, i.e., positively or negatively.

Consequently, country performance can be usefully classified into four categories, *virtuous*, *vicious* and two types of *lopsidedness*, i.e., lopsided with relatively strong HD/weak EG (called 'HD-lopsided') and lopsided with relatively weak HD/strong EG ('EG-lopsided'). In the virtuous cycle case, good HD enhances EG, which, in turn, promotes HD, and so on. In the vicious cycle case, poor performance on HD tends to lead to poor EG performance, which in turn depresses HD achievements, and so on. The stronger the linkages in the two chains described above, the more pronounced the cycle of EG and HD, in either a positive or negative direction.

Where some linkages are weak, cases of lopsided development may occur. On the one hand, good EG may not bring about large improvements in HD if, for example, there are weak linkages, such as a low social allocation ratio; on the other hand, good HD performance may not generate good EG if there is a dearth of complementary resources because of low investment rates. Such cases of lopsided development are unlikely to persist. Either the weak partner in the cycle eventually acts as a brake on the other partner, leading to a vicious cycle case; or, if the linkages are strengthened, possibly by policy change, a virtuous cycle may result.

One way of classifying countries into the four categories was to compare their performance on HD and EG (1960-2001) with the average performance of all developing countries (see figure 2). The

Figure 2:
HD and EG performance, 1960-2001



Source: World Bank, World Development Indicators database (2003).

vertical and horizontal grid lines represent the average performance for all developing countries for the period, with countries weighted by their populations in 2001. Most developing countries appear as either virtuous (NE quadrant), or vicious (SW quadrant); a significant number show an HD-lopsided pattern, and only one an EG-lopsided one. A strong regional pattern emerges, with East Asia heavily represented in the virtuous cycle quadrant. The majority of countries in the vicious cycle quadrant are from sub-Saharan Africa, and there are a significant number from Latin America. Latin America is also strongly represented in the HD-lopsided quadrant, the one EG-lopsided country being from Africa.

The important issue for policy purposes, of course, is how a country may move towards the virtuous cycle. Much can be learned about this by looking at the ways in which countries changed their location over time (table 3). Examining the movements of countries over the four decades between 1960 and 2001, we find that only two countries remained in the virtuous category throughout—the Republic of Korea and Singapore, which had highly successfully social and economic policies over the whole forty-year period. These countries combined a strong state, committed to advancing HD, with intelligent economic interventions, making good use of market forces. Four countries succeeded in moving from the HD-lopsided to the virtuous category—China from the 1960s to the 1970s; Viet Nam from the 1980s to the 1990s; Malaysia from the 1980s to the 1990s; and Chile from the 1980s to the 1990s. In the case of China and Viet Nam, the communist regimes had placed great emphasis on HD, resulting in HD-lopsided performance. In both countries, economic growth accelerated following economic reforms and a virtuous cycle was obtained. Malaysia had a virtuous performance in the 1960s, lapsed in the 1970s and then resumed good growth and HD in the 1980s and 1990s. High social expenditures explain the good HD performance, while economic growth was supported by a high investment rate. Chile suffered from depressed growth in the 1970s and 1980s as the Pinochet regime introduced very tough stabilization policies and radical economic reforms, but in the 1990s economic growth resumed.

Other countries moved from the virtuous category into the HD-lopsided category, often in response to particular short-term economic difficulties, such as the debt crisis of the 1980s, which affected many of the Latin American countries, and the 1997 East Asian financial crisis. The impact of the adjustment and debt crisis is shown, for example, in Brazil, Ecuador, Colombia, Costa Rica, the Dominican Republic, Jamaica and Uruguay, all of which moved from the virtuous quadrant to the HD-lopsided between the 1970s and the 1980s. The negative impact on economic growth of the East Asian crisis is shown by Thailand's fall from a virtuous cycle to HD-lopsided between the 1980s and 1990s. Indonesia started as a virtuous case (the 1960s), then had two decades of EG-lopsidedness and ended in the vicious cycle category owing to the impact of the financial crisis and political instability.

There was a strong tendency for countries in the vicious cycle to remain there. Altogether, twelve countries stayed in the vicious cycle throughout the four decades—nine from Africa, two (Bangladesh and Nepal) from Asia, as well as Bolivia in Latin America; only six exited, five into the HD-lopsided category (one only temporarily), and one into the EG-lopsided cagtegory. Almost all the countries leaving the vicious category had suffered civil wars which had ended or lessened in impact—e.g., El Salvador, Nicaragua, Guatemala, Papua New Guinea and the Sudan.

Lopsidedness, as expected, proved generally unstable. As noted, some countries succeeded in moving from the HD-lopsided category into the virtuous category. Just two countries remained in the HD-lopsided category throughout—Kuwait and Venezuela (Bolivarian Republic of), both countries which

Table 3:
Virtuous, vicious and lopsided performance, 1960-2001

	1960-1970	*1970-1980*	*1980-1990*	*1990-2001*
Africa				
Benin	Vicious	Vicious	Vicious	Vicious
Botswana	Virtuous	Virtuous	Virtuous	HD-lopsided
Burkina Faso	Vicious	Vicious	Vicious	Vicious
Burundi	EG-lopsided	Vicious	Vicious	Vicious
Cameroon	Vicious	EG-lopsided	Vicious	Vicious
Central African Republic	Vicious	Vicious	Vicious	Vicious
Chad	Vicious	Vicious	Vicious	Vicious
Congo, Rep. of	Virtuous	Virtuous	Vicious	Vicious
Côte d'Ivoire	EG-lopsided	Vicious	Vicious	Vicious
Dem. Rep. of the Congo	Vicious	Vicious	Vicious	Vicious
Ethiopia	-	-	Vicious	Vicious
Gabon	EG-lopsided	EG-lopsided	Vicious	Vicious
Gambia	-	Vicious	Vicious	Vicious
Ghana	HD-lopsided	Vicious	Vicious	Vicious
Guinea-Bissau	-	Vicious	Vicious	Vicious
Kenya	HD-lopsided	Virtuous	HD-lopsided	HD-lopsided
Lesotho	EG-lopsided	EG-lopsided	Vicious	Vicious
Madagascar	Vicious	Vicious	Vicious	Vicious
Malawi	EG-lopsided	EG-Lopsided	Vicious	Vicious
Mali	-	Vicious	Vicious	Vicious
Mauritania	EG-lopsided	Vicious	Vicious	Vicious
Mauritius	-	-	Virtuous	HD-lopsided
Mozambique	-	-	Vicious	EG-lopsided
Namibia	-	-	Vicious	Vicious
Niger	Vicious	Vicious	Vicious	Vicious
Nigeria	EG-lopsided	Vicious	Vicious	Vicious
Rwanda	Vicious	Vicious	Vicious	Vicious
Senegal	Vicious	Vicious	Vicious	Vicious
Sierra Leone	EG-lopsided	Vicious	Vicious	Vicious
South Africa	Virtuous	HD-lopsided	HD-lopsided	HD-lopsided
Sudan	Vicious	Vicious	Vicious	EG-lopsided
Togo	EG-lopsided	Vicious	Vicious	Vicious
Zambia	HD-lopsided	Vicious	Vicious	Vicious
Zimbabwe	Virtuous	HD-lopsided	HD-lopsided	HD-lopsided
Middle East				
Algeria	Vicious	EG-lopsided	Vicious	HD-lopsided
Egypt	EG-lopsided	EG-lopsided	Vicious	Vicious
Iran, Islamic Rep. of	-	Vicious	Vicious	HD-lopsided
Jordan	-	-	HD-lopsided	HD-lopsided
Kuwait	HD-lopsided	HD-lopsided	HD-lopsided	HD-lopsided
Morocco	EG-lopsided	EG-lopsided	Vicious	Vicious
Oman	EG-lopsided	Vicious	Virtuous	-
Saudi Arabia	EG-lopsided	EG-lopsided	HD-lopsided	HD-lopsided
Syrian Arab Republic	Virtuous	Virtuous	HD-lopsided	HD-lopsided
Tunisia	EG-lopsided	EG-lopsided	HD-lopsided	HD-lopsided
Turkey	-	Vicious	Vicious	HD-lopsided
United Arab Emirates	-	HD-lopsided	HD-lopsided	HD-lopsided

	1960-1970	*1970-1980*	*1980-1990*	*1990-2001*
East Asia				
China	HD-lopsided	Virtuous	Virtuous	Virtuous
Hong Kong SAR	Virtuous	Virtuous	Virtuous	HD-lopsided
Indonesia	Virtuous	EG-lopsided	EG-lopsided	HD-lopsided
Lao PDR	-	-	Vicious	Vicious
Malaysia	Virtuous	Virtuous	HD-lopsided	Virtuous
Mongolia	-	-	Vicious	Vicious
Papua New Guinea	EG-lopsided	Vicious	HD-lopsided	Vicious
Philippines	Virtuous	Virtuous	HD-lopsided	HD-lopsided
Republic of Korea	Virtuous	Virtuous	Virtuous	Virtuous
Singapore	Virtuous	Virtuous	Virtuous	Virtuous
Thailand	Virtuous	Virtuous	Virtuous	HD-lopsided
Viet Nam	-	-	HD-lopsided	Virtuous
Latin America				
Argentina	Virtuous	HD-lopsided	HD-lopsided	HD-lopsided
Bolivia	Vicious	Vicious	Vicious	Vicious
Brazil	Virtuous	Virtuous	HD-lopsided	HD-lopsided
Chile	Virtuous	HD-lopsided	HD-lopsided	Virtuous
Colombia	Virtuous	Virtuous	HD-lopsided	HD-lopsided
Costa Rica	Virtuous	Virtuous	HD-lopsided	HD-lopsided
Dominican Republic	Virtuous	Virtuous	HD-lopsided	Virtuous
Ecuador	HD-lopsided	Virtuous	HD-lopsided	HD-lopsided
El Salvador	Virtuous	Vicious	Vicious	HD-lopsided
Guatemala	Virtuous	EG-lopsided	Vicious	HD-lopsided
Haiti	Vicious	EG-lopsided	Vicious	Vicious
Honduras	Vicious	Vicious	HD-lopsided	HD-lopsided
Jamaica	Virtuous	HD-lopsided	HD-lopsided	HD-lopsided
Mexico	Virtuous	Virtuous	HD-lopsided	HD-lopsided
Nicaragua	Virtuous	HD-lopsided	Vicious	HD-lopsided
Panama	Virtuous	HD-lopsided	HD-lopsided	HD-lopsided
Paraguay	Virtuous	Virtuous	HD-lopsided	HD-lopsided
Peru	Virtuous	Vicious	HD-lopsided	HD-lopsided
Trinidad and Tobago	Virtuous	Virtuous	HD-lopsided	HD-lopsided
Uruguay	HD-lopsided	Virtuous	HD-lopsided	HD-lopsided
Venezuela (Bolivarian Rep. of)	HD-lopsided	HD-lopsided	HD-lopsided	HD-lopsided
South Asia				
Bangladesh	Vicious	Vicious	Vicious	Vicious
India	Vicious	Vicious	EG-lopsided	Vicious
Nepal	Vicious	Vicious	Vicious	Vicious
Pakistan	EG-lopsided	Vicious	Vicious	Vicious
Sri Lanka	Virtuous	Virtuous	HD-lopsided	HD-lopsided

Source: World Bank, World Development Indicators database (2003).

Notes: All classifications of countries into quadrants are based on performance relative to population weighted developing world averages.

could sustain HD with large expenditures financed by oil revenues. No country remained in the EG-lopsided category. EG-lopsided countries almost invariably fell into the vicious category. This was a pattern followed by sixteen countries, many of them in Africa, which succeeded in first achieving relatively high economic growth despite poor HD for a period following independence, after which growth lapsed. No country succeeded in moving from EG-lopsided to virtuous.

These findings clearly have some strong implications for policy sequencing. They show the need for balance in promoting HD and EG because it is very difficult to sustain one without the other—indeed, it seems to be impossible in the case of EG. Moreover, of greatest importance, the findings imply that it is not possible to reach the ideal of a virtuous cycle by first generating improved EG while neglecting HD, since any EG attained in this way will not be sustained.

Conclusions and policy implications

Our investigation into the determinants of HD progress and EG has clearly demonstrated the importance of the two-way relationship between them. The empirical work confirmed the significance of a number of links in the two chains—including income distribution, the social expenditure ratio and female education in Chain A, and the investment ratio in Chain B, in addition to the important inputs of EG and HD, respectively. Moreover, we have found that, even in the presence of some weak links in a chain, it is possible to achieve good progress by particularly strong performance in other links.

However, our most important conclusion concerns sequencing. Because of the strong two-way relationship between EG and HD, one has to promote *both* to sustain progress in either. Economic growth, which is an important input into HD improvement, is itself not sustainable without improvement in HD. The investigation of country changes over time has strong implications for the phasing of policies. Economic policy has tended to focus priority on getting the economic fundamentals 'right' as a necessary precondition for economic growth, arguing that HD improvement must await such economic growth—as in the classic 'Washington Consensus', for example. In sharp contrast, our findings contradict the view that HD improvement may be postponed until economic resource expansion makes it affordable. If HD improvement is postponed in this way, EG itself will not be sustained.

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