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Population and Poverty: A Review of the Links, Evidence and Implications for the Philippines*

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Introduction

The relationship between demographic changes and poverty is an old issue that has gained currency because of the recent focus of governments, multilateral agencies, and other development organizations on poverty alleviation. For the Philippines, all of the post-Martial Law governments have made poverty alleviation their centerpiece program. Analysts have been trying to understand why, in spite of this consistent focus, gains in poverty alleviation in the country have been modest. The most accepted explanation, being the most obvious perhaps, is the uneven economic growth performance. However, it is wellknown, although heavily debated upon, that demographic factors play an important role not only in poverty alleviation but even in economic growth as well. Providing a systematic clarification of this role is the objective of this paper. Such clarification may well inform discussion on the role demographic changes play on poverty alleviation efforts in the country.

The paper is organized as follows. The next two sections provide a status report on the demographic as well as the poverty front. To provide a background on the interaction between population and de-

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velopment, the experience of the Philippines and Thailand in the past 40 years is briefly compared in the following section. This is then followed by a description of the known links between demographic changes and poverty. Then a section where empirical evidence of the links are reviewed follows. The final section draws some implications for policy.

Trends in population and poverty

Population change and its components

Population change can be divided into changes in size, structure, especially age structure, and distribution across space. This is easily derivable from the mathematical identity that changes in population size can come from either births, deaths, or net migration. An empirical regularity, known as the demographic transition has been long observed by demographers. This is characterized as consequent on, and later on also causing, falling child mortality is followed by falling fertility. Accordingly, at the first stage, population growth rises because of a decline in mortality, which is usually distributed almost evenly across age groups, with fertility remaining high. At this stage, the youth dependency ratio will be high. In the next stage, fertility starts to fall with mortality starting to settle at a low level so population growth will start to decline. In this stage, the youth dependency ratio will start to go down. Finally, both fertility and mortality will be low and remain low and population growth also low. This will be accompanied by high old-age dependency ratio. The period where the youth dependency starts to decline, which also means an increasing proportion of economically active population, provides a window of opportunity for the so-called "demographic bonus" that can spur economic growth. This is now one of the familiar explanations to the East Asia high economic growth phenomenon in the past two decades (e.g., Bloom and Williamson 1998).

Demographic trends and implications[1]

Population size and growth

The Philippine population has almost quadrupled in 52 years (from 19.2 million in 1948 to 76.5 million in 2000). The growth rate was about 3 percent in the 1960s slowing down to 2.3 percent in the 1990s (Table 1). This growth rate is still very high compared to the country's ASEAN

[1] Largely taken from Orbeta (2002).

Table 1. Estimated and projected size, average annual growth rate and and absolute increase of population, 1965-2025

	Total Population (millions)			Growth Rate %			Absolute Increase (millions)	
	1965	1995	2025 *	1960-1965	1990-1995	2020-2025 *	1965-1995	1995-2025
NIEs								
Hongkong	3.7	6.2	8.7	3.7	1.7	0.7	2.5	2.5
Republic of Korea	28.5	45.0	52.1	2.1	1.0	0.3	16.5	7.1
Singapore	1.9	3.5	5.0	2.8	2.8	0.5	1.6	1.5
Taipe, China								
PRC	729.2	1219.3	1470.8	2.1	1.1	0.3	490.2	251.4
Southeast Asi								
Indonesia	106.7	197.6	272.9	2.1	1.6	0.8	91.0	75.3
Malaysia	9.5	20.0	31.3	3.1	2.3	1.1	10.5	11.3
Philippines	31.6	68.3	107.1	3.1	2.3	1.1	36.8	38.7
Thailand	31.2	58.7	77.5	3.2	1.4	0.6	27.5	18.8
Vietnam	38.1	72.8	105.5	2.5	2.0	1.0	34.7	32.6
South Asia								
Bangladesh	58.5	123.6	210.8	2.5	2.3	1.3	65.1	87.2
India	495.2	927.1	1351.8	2.3	1.9	0.9	431.9	424.7
Pakistan	54.8	123.6	251.0	2.3	2.4	1.9	68.9	127.3
Sri Lanka	11.0	18.0	22.5	2.5	1.2	0.4	7.0	4.5

** Medium assumption*

Source: Population Division, Department of Economic and Social Affairs, UN. World Population Prospects, The 2000 Revision.

neighbors. Thailand and Indonesia, for instance, reduced their growth rates to 1.4 and 1.6, respectively, in the 1990s. Consequently, in comparison to Thailand that almost had the same population size in 1965, the country had about 14 million more people around year 2000.

Fertility

Data show what appears to be a fairly rapid decline in fertility in the 1970s. This was stalled in the 1980s and 1990s and lately even showed signs of a slight increase. Total fertility rate (TFR) declined from about 6 at the beginning of the 1960s to 3.6 by the middle of 1990s. This trend in fertility reduction is slow by East and even Southeast Asian standards (Table 2). Starting with about the same TFRs at the start of 1960s, Thailand and Indonesia had reduced their TFR to 2.1 and 2.6, respectively, by the middle of 1990s. This means a longer catch-up time to fertility levels already achieved by the ASEAN neighbors.

Mortality

Mortality, measured either as Crude Death Rate or Infant Mortality Rate, showed rapid decline during the early post-war period because of advances in public health and rapid economic development. This decline has slowed down in the recent past as low levels of mortality or high levels of life expectancy have been achieved. This is clearly depicted by the developments in infant mortality rate (IMR) (Table 2). With the uneven economic performance, the slow decline of the IMR in the Philippines is to be expected (De Guzman 1998). Thailand with a consistent high economic growth rate, was able to sustain lower infant mortality rates than the Philippines through out the post-war period. South Korea, starting with a low, but not too far below, level of IMR in 1960-65, achieved an even faster decline.

Based on the above trends in fertility and mortality, the Philippine population growth rate is understandably higher than many of our neighbors. It is also clear that since our fertility remains high, the only thing that prevented the full impact of that on population growth is that our uneven economic performance has prevented us from achieving even lower mortality rates. What is disturbing, and may be unknown to many, is that the continued high fertility rates will also mean long years of high youth dependency burden, which will rob us of the window of opportunity for the demographic bonus that allowed other East Asian countries to increase their savings rates, physical and human capital investments that spur their economic growth in the last

Table 2. Fertility and mortality indicators

Countries	Total Fertility Rate						Infant Mortality Rate					
	1960-65	1970-75	1980-85	1990-95	1995-00	2000-05	1960-65	1970-75	1980-85	1990-95	1995-00	2000-05
NIEs												
Hongkong	5.31	2.89	1.80	1.22	1.17	1.17	33	17	10	5	4	4
Rep.of Korea	5.63	4.28	2.23	1.68	1.51	1.51	70	38	23	12	8	7
Singapore	4.93	2.62	1.69	1.75	1.60	1.45	30	19	8	6	5	5
Taipei, China												
PRC	5.72	4.86	2.55	1.92	1.80	1.80	121	61	52	47	41	37
Southeast Asia												
Cambodia	6.29	5.54	6.40	5.40	5.25	4.77	140	181	129	91	83	73
Indonesia	5.42	5.20	4.11	3.00	2.60	2.27	166	126	89	59	48	40
Lao PDR	6.15	6.15	6.69	5.80	5.30	4.80	150	145	128	104	97	88
Malaysia	6.72	5.15	4.24	3.62	3.26	2.90	63	42	28	15	12	10
Philippines	6.85	6.00	4.95	4.14	3.64	3.24	96	80	61	43	34	29
Thailand	6.40	4.97	3.05	2.10	2.10	2.00	85	73	49	29	25	21
Vietnam	7.25	6.70	4.50	3.30	2.50	2.25	130	107	70	47	40	34
South Asia												
Bangladesh	7.10	6.40	5.30	4.30	3.80	3.56	178	150	122	91	79	67
India	5.81	5.43	4.48	3.70	3.32	2.97	157	132	107	79	73	65
Pakistan	6.28	6.28	6.23	5.83	5.48	5.08	161	142	123	104	95	87
Sri Lanka	5.50	4.08	3.40	2.40	2.10	2.09	65	47	36	27	23	20

Source: Population Division, Department of Economic and Social Affairs, UN. World Population Prospects, The 2000 Revision.

two decades. Herrin and Pernia (2000) describes what we continue to bear as "demographic onus" rather than a demographic bonus.

Definition and measures of poverty

There are many issues in poverty measurement. This paper will focus only on the main issues being discussed for the Philippines.[2] The official poverty statistics uses current income as the basis for computing poverty incidence. Balisacan (2001) argues that current consumption is better than current income as the basis for measuring poverty from both conceptual and practical grounds. He further argues that income can under- or overestimate living standards through borrowing and saving. Furthermore, he says that welfare level is determined by "life-cycle" or "permanent" incomes and current consumption is a better measure of this income. Finally, income is much more difficult to obtain and more prone to underreporting. Self-rated poverty, which is dependent neither on incomes nor on consumption but on qualitative self-assessment, has also been proposed by Dr. Mahar Mangahas of the Social Weather Stations.

There are also multidimensional measures of well-being. One that has gained local official acceptance is the so-called minimum basic needs indicators. This consists of several indicators[3] grouped into three, namely: survival, security and enabling. Reyes (2002) briefly describes its provenance in her paper. Another multidimensional measure of well-being that has gained international acceptance is the Human Development Index (HDI) developed by United Nations Development Programme. This is based on four indicators: 1) life expectancy at birth; 2) functional literacy and the 3) combined elementary and high school enrollment ratio; and 4) real per capita income.

Trends in poverty alleviation

The progress in poverty alleviation in the country is modest (Reyes 2002). In fact the number of the poor has not declined but even increased from 4.6 million in 1985 to 5.14 million in 2000. In addition, the reduction in poverty incidence is only happening in urban areas. While the poverty incidence in urban areas declined by 14 percentage points between 1985 and 2000, the corresponding number for rural

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[2] For a more complete discussion of poverty measurement issues, especially in the Philippine context, consult Lipton and Ravallion (1995) and Reyes (2002).

[3] As of last count, it included 33 indicators (Reyes 2002).

areas is only 4 percentage points (Table 3). There also remains a wide disparity of poverty incidence across geographic areas. For instance, in 2000, it stood at almost 66 percent in the Autonomous Region of Muslim Mindanao (ARMM) and 55 percent in the Bicol region as against only 9 percent in the National Capital Region. Variation at the provincial level is even more pronounced.

Income inequality has not improved either. The share of the poorest quintile has even declined from 4.8 percent in 1985 to 4.7 percent in 2000 (Reyes 2002). The share of the richest quintile, on the other hand, increased from 51.2 percent to 54.8 percent over the same period. In addition, the Gini concentration ratio also went up from 0.47 in 1985 to 0.51 in 2000 (Figure 1).

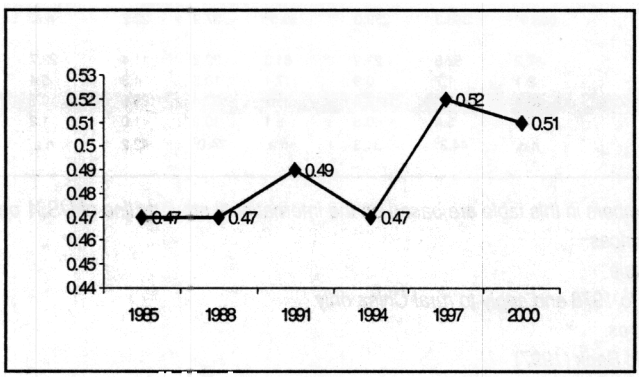
The Asian crisis experience has also shown that the Philippine population is vulnerable to shocks as gains in poverty alleviation during the earlier periods were easily reversed during the crises.

Table 3. Poverty incidence of families, urban-rural, 1985-2000

	Poverty Incidence					
	1985	1988	1991	1994	1997	2000
Philippines	44.2	40.2	39.9	35.5	31.8	33.7
Urban	33.6	30.1	31.1	24	17.9	19.9
Rural	50.7	46.3	48.6	47	44.4	46.9

Sources of Basic Data: Family Income and Expenditure Survey, 1985-2000

Figure 1. GINI ratios, 1975-2000



The poverty decomposition analysis of Reyes (2002) reveals that for the period 1985-2000, the contribution of the growth component was larger than the distribution component. The growth component contributed a 16.5 percentage-point reduction in poverty incidence but the worsening of the distribution increased it by 4.7 percentage points, resulting in a net decline of 9.4 percentage points with 2.4 percentage points classified as residual.

Table 4 shows that our poverty reduction record, compared to those of our neighboring countries and using the US$1 a day poverty threshold, is slower. In addition, most of these countries were able to reduce the number of people living in poverty. In terms of the HDI, our neighbors have also over taken us (Table 5).

A digression: population and development in the Philippines and Thailand

To illustrate the role of demographic changes in development, this paper compares briefly the socioeconomic development of the Philippines and Thailand in the last 40 years. Table 1 shows that both had about 31 million people in 1965. In terms of per capita income in real US$, however, the Philippines had $725 while Thailand had only $465 (Table 6). Forty years later, the latest estimate of Philippine population is 76.5 million, nearly 14 million than Thailand's 62.8 million. In terms of per capita income, Table 6 shows that Philippines had 1,167 real US$ while Thailand had 2,805 US$ in 2000 or almost 2.5 times.

Table 4. Poverty in selected Asian countries, summary statistics: 1975-95

Economy	People in poverty (million)			Head-count Index (percent)			Poverty Gap (percent)		
	75	85	95	75	85	95	75	85	95
China	568.9[a]	398.3	269.3	59.5[a]	37.9	22.2	n.a.		7.0
Indonesia	87.2	52.8	21.9	64.3	32.2	11.4	23.7	8.5	1.7
Malaysia	2.1	1.7	0.9	17.4	10.8	4.3	5.4	2.5	<1.0
Philippines	15.4	17.7	17.6	35.7	32.4	25.5	10.8	9.2	6.5
Thailand	3.4	5.4	<0.5	8.1	10.0	<1.0	1.2	1.5	<1.0
Vietnam	n.a.	44.3[b]	31.3	n.a.	74.0[b]	42.2	n.a.	28.0[b]	11.9

Notes: All numbers in this table are based on the international proverty line of US$1 per person per day at 1985 prices.

na Not available

[a] *Data relate to 1978 and apply to rural China only.*

[b] *In 1984 figures.*

Source: World Bank (1997)

Table 5. Human Development Index trends

Country/Year	1975	1980	1985	1990	1995	2000
Philippines	0.652	0.684	0.688	0.716	0.733	0.754
Malaysia	0.616	0.659	0.693	0.722	0.76	0.782
Thailand	0.604	0.645	0.676	0.713	0.749	0.762
Indonesia	0.469	0.53	0.582	0.623	0.664	0.684
Vietnam			0.583	0.605	0.649	0.688

Sources: Human Development Indicators, HDR 2002; Table 24 of Reyes (2002)

The developments of these two indicators over the years are shown in Figures 2 and 3. While it would be wrong to attribute all of this difference to demographic changes, comparing the two in this area would provide a useful background for the succeeding discussions.

The big difference between the two countries lies in the divergence in fertility levels, with Thailand being able to bring down its TFR to a replacement level of around 2.1 at the beginning of the 1990s compared to the Philippines' more than 4 at the time and still over 3 per woman today (Figure 4). There is not much divergence in terms of infant mortality as both countries were able to reduce their mortality levels in a very similar fashion, with Thailand protecting her initial advantage all throughout the period (Figure 5). The difference in fertility levels spawned not only a divergence in population growth and population size (as discussed above) but also a glaring deviation in youth dependency burden, as shown in Figure 6. Given that the fertility rates are hardly closing, this difference in dependency burden is sure to continue for more years. Among the known impact of high dependency burden is that it depresses savings and, consequently, physical as well as human capital investments. Figures 7 and 8 show that indeed savings and investments have deviated since mid-80's. Finally, in recent years Thailand has begun to surpass the Philippines even in investments in human capital, which is evident in part in its enrollment ratios in both secondary and tertiary levels, which have exceeded the latter's (Figure 9).

Population and poverty: a description of the links

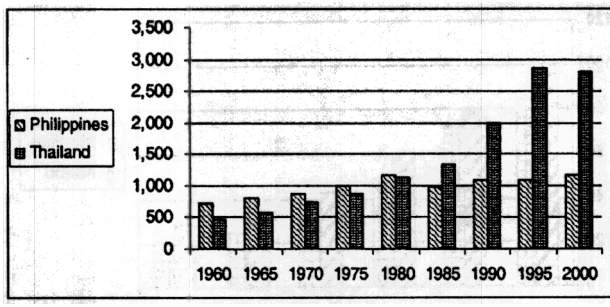
To describe the links between population and poverty, this paper deems it best to start with the Population and Sustainable Development Framework (PSDF), as presented in the 2001-2004 Philippine Population Management Program Directional Plan (Figure 10) and explained in greater

Table 6. GDP per capita (constant 1995, US$)

Country Name	1960	1965	1970	1975	1980	1985	1990	1995	2000
NIEs									
Hong Kong, China	3,008	4,604	5,947	7,404	11,290	13,690	18,813	22,619	24,218
Korea, Rep.	1,325	1,547	2,283	3,023	3,910	5,322	7,967	10,874	13,062
Singapore	2,676	3,249	5,426	7,836	11,048	13,163	17,693	23,650	28,230
Taipei, China									
PRC	112	106	120	138	168	261	349	581	824
Southeast Asia									
Cambodia	..	..	..	..	..	..	240	275	297
Indonesia	249	247	298	384	503	602	777	1,042	994
Lao PDR	..	..	..	..	..	290	313	376	450
Malaysia	975	1,165	1,371	1,712	2,297	2,587	3,104	4,310	4,797
Philippines	725	801	867	999	1,173	974	1,091	1,085	1,167
Thailand	465	566	752	860	1,117	1,330	1,999	2,871	2,805
Vietnam	..	..	..	..	..	183	206	277	356
South Asia									
Bangladesh	217	240	249	208	225	258	278	316	373
India	183	194	211	217	226	264	323	380	459
Pakistan	181	225	274	274	318	385	448	500	516
Sri Lanka	279	292	345	381	451	534	589	718	860

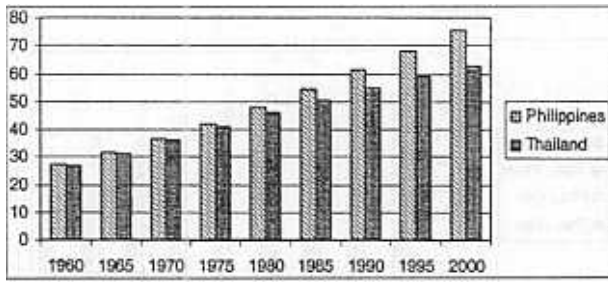
Source: World Bank, World Development Indicators 2002 CD.

Figure 2. **Per capita GDP, real US$ (1995 = 100)**



Source: World Bank, World Development Indicators 2002

Figure 3. **Population size, 1960-2000**



Source: UN World Population Prospects 2000 Revised

Figure 4. **Total fertility rate, 1960 to 2005**

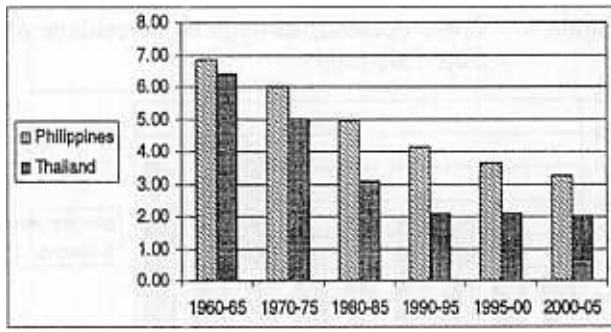


Figure 5. Infant mortality rate, 1960 to 2005

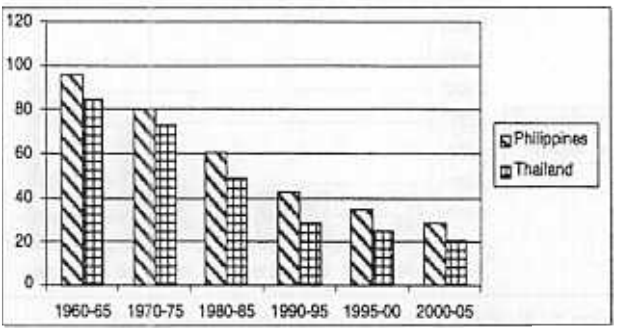


Figure 6. Youth and old dependency ratios, 1960 to 2005

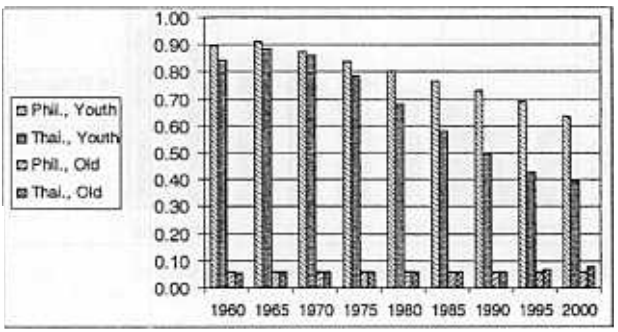


Figure 7. Gross domestic savings as percentage of GDP, 1960-2000

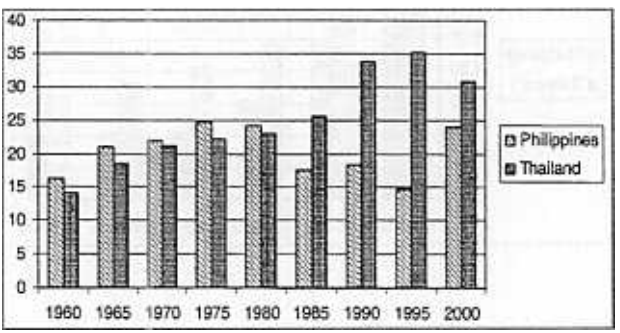


Figure 8. Gross capital formation as percentage of GDP, 1960-2000

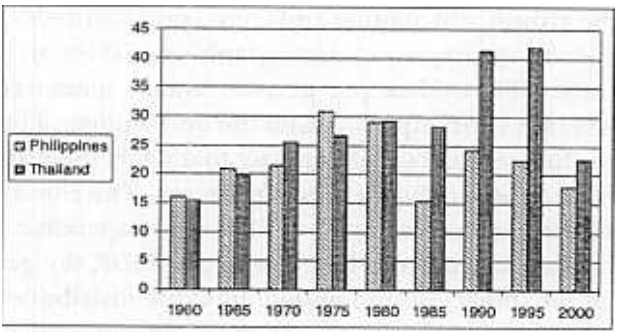
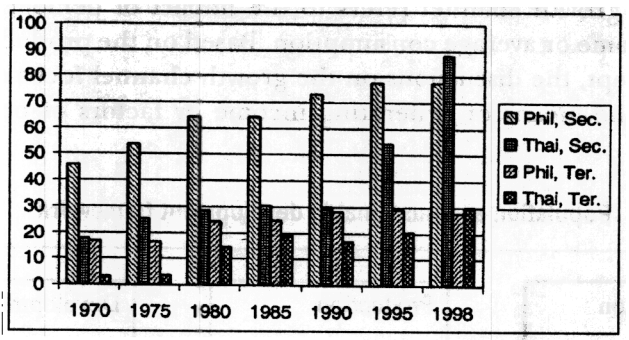


Figure 9. Gross enrolment rate, secondary and tertiary, 1970-1998



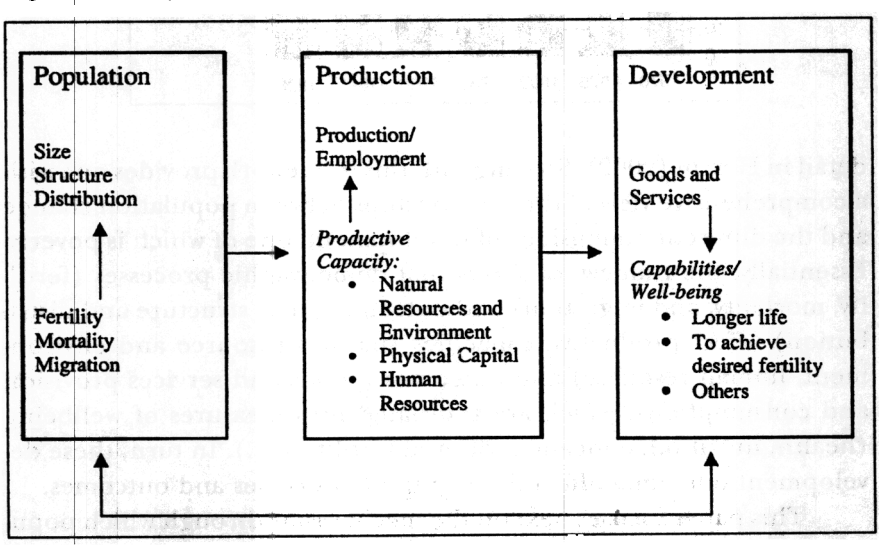
detail in Herrin (2002). Starting with this framework provides one with a comprehensive view of the relationships between population change and the different dimensions of development, one of which is poverty. Essentially, the framework shows that demographic processes (fertility, mortality, and migration) and outcomes (size, structure and distribution) affect productive capacities (natural resource and environment, human resource) and outcomes (goods and services provision and consumption), which are translated into measures of wellbeing (health, nutrition, education, desired fertility, etc.). In turn, these development outcomes affect demographic processes and outcomes.

This paper focuses next on the mechanisms through which population changes affect poverty. While not explicitly depicted, it would soon be clear that this is subsumed in the framework.

There are three main channels through which population affect poverty.[4] Following the taxonomy in Eastwood and Lipton (1999, 2001), these are: the growth, distribution and conversion channels. The growth channel refers to the impact of demographic variables on the level or growth of attainable welfare per person, usually measured by mean income or average consumption, given the distribution of income. The distribution channel refers to the impact that alters the distribution of income, given the attainable welfare per person. The conversion channel refers to the changes in actual wellbeing or capabilities, given the attainable welfare per person. In terms of the PSDF, the growth channel refers to the impact on the middle box; the distribution channel, on the impact on the elements of both the middle and the right boxes; and the conversion channel, on the right box. Eastwood and Lipton (2001) point out that, among the three, only the growth channel has received considerable attention compared to the other two.

The growth channel refers to the impact of demographics on mean income or average consumption. Based on the production function concept, the discussions on the growth channel focus on the impact on the means of generating income or factors of production,

Figure 10. Population and sustainable development framework



[4] This and the subsequent paragraphs in this section draw heavily from Eastwood and Lipton (1999, 2001).

namely, physical and human capital as well as technology and productivity. This is usually discussed in two levels, the macro or aggregate level and the micro or household level. At the aggregate level, the issues revolve around the impact of population changes in the aggregate accumulation of physical and human capital. Central to the discussion is the impact on savings, because it finances investments. The impact on aggregate investments on human capital such as education and health, has also been given ample attention. Finally, on the role of population changes on the development of technology and productivity, the central question is whether population changes affect the development of technology and thereby affect productivity. At the household level, similar issues are relevant for almost identical reasons.

What are the mechanisms in the distribution channel? Even if relatively little work has been done in this area this issue has a long history. Eastwood and Lipton (1999) trace the origins of the income distribution effect of higher fertility to Malthus. He hypothesized that at the aggregate level, high fertility would raise the price of food and lower the price of labor. Since the main asset of the poor is his labor, this is expected to affect the distribution of income. Eastwood and Lipton (1999, 2001) identify two groups of ways through which demographics affect inequality and poverty. These are the *dependency effect* and the *acquisition effect.* These two subsume the aforementioned Malthusian effect. The dependency effect refers to the hypothesis that higher fertility worsens the distribution of consumption if the extra births are concentrated in the poorer households, raising dependency ratios among the poor disproportionately. The acquisition effect, on the other hand, refers to the worsening of consumption distribution via the ability or willingness of nondependents to acquire income or via their savings behavior and factor rewards. The key to the distribution effect is differential impact on the poor vis-à-vis the nonpoor households. Thus, the distribution effect can be viewed both at the aggregate and household levels.

Dwelling further on the acquisition effect, this paper expresses it in four ways, namely: 1) child costs, 2) labor supply, 3) savings, or 4) factor rewards. *Child costs* refers to added costs due to the presence of an extra child, such as the direct or opportunity cost of child care. Additional dependents in a household may induce greater labor supply from nondependents. Fertility may affect household accumulation. While initially the effect of an additional child on household labor

supply is indeterminate due to the opposing negative effect via demands for child care and positive effect due to induced labor supply, over time the child enters the labor force and increase household labor supply. This may depress real wages for the poor who tend to be unskilled compared to the rich—the Malthusian effect.

Finally, what are the mechanisms in the conversion channel? As noted earlier, this channel refers to whether demographics affect the capacity to transform a given income or consumption expenditure level into welfare or capabilities such as health and schooling. Necessarily, this effect will primarily have to be viewed at the household level. Again, like the distribution effect, this is also dependent on differential behavior between the poor and the nonpoor households. The key issues here include: 1) whether a large family is a rational choice for the poor; 2) if the economies of scale in consumption are more important than sibling crowding; 3) if children in large households enjoy worse education and health care prospects; 4) whether getting out of poverty becomes easier or more difficult by extra births.

Three more concerns have to be mentioned on the relationship between population and poverty. These are differential demographic transition, mutual causation, and intergenerational transmission. *Differential demographic transition* refers to the observed regularity that the poor usually experience declining mortality and subsequently falling fertility later, and with a longer lag between them, than the nonpoor. This has significant implications on the distribution and conversion effects. *Mutual causation* refers to the fact that rapid population growth—early first births, large families, high child-adult ratios and closer spacing of siblings—may not only be a cause but also a consequence of poverty due largely to constraints on and even the rational behavior of the poor. This has troubled empirical tests on the relationship between demographic changes and poverty. Finally, intergenerational transmission of poverty and inequality has been cited as a very important welfare issue. Lam (1987), for instance, is not as strong on the other of aspects of the impact of demography on inequality but identified this issue as very important. His basis is the well-accepted negative impact of high fertility on child endowments (including human capital). Incidentally, this has also been identifies as the basis for the intergenerational vicious cycle of poverty argument triggered by high fertility rates among the poor.

Review of empirical evidence

Growth effects

The relationship between population change and the level and growth in per capita income has been the subject of scrutiny and a long-drawn debate. The assessment in the 1980s qualified the strong negative impact verdict in the 1970s. For instance, a more calculated assessment exemplified by the statement from the National Research Council (1986) states that "on balance, we reach the qualitative conclusion that slower population growth would be beneficial to economic development for most developing countries." More recent empirical results utilizing convergence-pattern or technology gap models such as Kelly and Schmidt (1995, 2001), however, yielded large negative impact of population change on growth of per capita income. In particular, a study by Kelley and Schmidt (1995), using data covering a 30-year period (1960-1990), finds that a unit decline from recorded median population growth rate of 2.54 to 1.54 percent results in an increase of per capita GNP growth from its median of 1.36 to 2.00 percent. High crude birth rates were found to reduce economic growth while decreases in crude death rates increase economic growth. A survey and re-estimation of eight models incorporating several economic-demographic approaches given in Kelly and Schmidt (2001) validates this earlier result. The survey highlights the following results: 1) demographic trends (declining population growth, fertility, mortality; changing age distribution; and rising density and population sizes) have sizeable impact on economic growth; 2) while the overall impact of population growth is negative, fertility and mortality effects have offsetting effects with increases due to mortality decline stimulating growth while increases due to rise in fertility attenuating growth; 3) increasing densities and population size contribute a positive but relatively small boost to economic growth, with scale effects dominating density; 4) in most models, the impact of demography has declined over time.

It is worth noting that the role of changing age structure accompanying demographic change was found to have a considerable explanatory power to rapid economic growth in East Asia in the past two decades. Thus, it is argued that population neutralism of the 1980s maybe was the offshoot of the too much focus on impact of aggregate population growth to the neglect of the impact of changes in the age structure (Bloom et al. 2001). It is also argued that in the early stages

of the demographic transition, per capita income declines because of large youth dependency burden and a small proportion of working-age adult working and saving. As the transition proceeds, per capita income increases as the share is reversed with relatively more workers and savers. This constitutes a potential window of opportunity, now popularly known as the "demographic bonus," which will evaporate as the share of the elderly rises in the later phase of the transition. Simulations done by Lee et al. (2001), using data from Taiwan, validated the hypothesis of increases in savings rates as the proportion of working age population increases under the assumption of constant interest rate and constant productivity rate. Bloom and Williamson (1998) find that population dynamics explain as much as 1.4 to 1.9 percentage points of the GDP per capita growth in East Asia, or as much as one-third of the average East Asian miracle GDP per capita growth rate (1.9/6.1). In Southeast Asia, the estimated effect ranges from 0.9 to 1.8 points of economic growth or about half (1.8/3.8) of the recorded growth in GDP per capita. Finally, Eastwood and Lipton (2001) estimate that had the average country[5] reduced its birth rate by five per thousand throughout the 1980s, the average poverty incidence would have been declined from 18.9 percent in the mid-1980s to 12.6 percent between 1990 and 1995. About half of this reduction is attributable to increases in economic growth.

Simulations using the Population and Development Planning (PDP) Model, an economic-demographic model estimated using Philippine data, also show that higher population growth lowers GNP per capita level (Orbeta et al. 1999). Furthermore, this negative effect was found to be much bigger if foreign capital inflows are held fixed.

A look at the growth performance of countries in Asia shows that the Philippines had lagged behind Thailand, which had about the same population size and even lower per capita income in 1965. Thailand's population is growing at less than one percent while that of the Philippines is still growing at more than 2 percent. As a result, after 35 years the Philippines has about 14 million more people and about less than half of Thailand's per capita income.

As noted earlier, growth in per capita income is also affected by physical and human capital investments. At the macrolevel, it was found

[5] The dataset includes 45 less developed and transition countries.

that increased human capital expenditures (aggregate expenditures on education and health) spawned by rapid population growth are insufficient to maintain per capita levels, which implies negative impact on education and health output (Orbeta 1992).

At the household level, Herrin (1993) finds that accumulation of household assets is negatively affected by the number of young children 0 to 6 and 7 to 12 years old. This result is corroborated by Mason (1992). The study finds that child bearing negatively affects the saving rate. Although it does not affect the absolute amount of savings, asset per child was found to be greater in lower fertility households.

Distribution effects

As has been mentioned earlier, there has not been as much work on this channel compared to the growth effects. In an earlier review, Lam (1987) notes that empirical evidence leads to mixed conclusions. Furthermore, the review emphasizes that the "certainty of negative distributional effects of population growth expressed in the 1974 World Bank report on population and development . . . seems to be a much stronger conclusion than the empirical and theoretical analysis of the issues can currently support."

Utilizing newer modeling ideas, recent results such as Eastwood and Lipton (1999; 2001), provide more definitive conclusions. The study not only found that high fertility retards economic growth (as noted above) but also skews the distribution of income against the poor. Their estimate revealed that half of the estimated decline in poverty could be attributed to increases in economic growth and half to changes in the distribution of income. The results further highlighted the fact that as fertility decline spreads to poor households, the poverty-reducing benefits of fertility decline increase even more. Reinforcing this result are similar findings in Brazil, a country that is in the later stages of fertility transition (Paes de Barros et al. 2001).

Dependency effects

In trying to find evidence of the dependency effect, Eastwood and Lipton (1999) used 18 of the 56 World Bank Poverty Assessments on dependency ratios for the poor and nonpoor. The data show only a slight dependency effect as the dilution ratio of the poor was found to be only slightly higher than those for the nonpoor.

Acquisition effects

In terms of acquisition effect, studies on the impact of additional children on time allocation show that the mother's labor market hours decline 14 months after giving birth, after which they return to the previous level; the father's labor market hours are not affected, neither does the loss of the labor market hours of the mother induce more labor market hours for the father; the labor market time of the older daughter, however, increased (Tiefenthaler 1997). It appears that the older daughter replaces the lost market time of the mother. Earlier studies both support and negate results of this finding. For instance, Quizon-King (1978) finds that the labor market time of both mother and father is not affected and only the mother's home time increases. This is largely corroborated in King and Evenson (1983). Garcia (1990), on the other hand, finds that having young children decreases the market time of the mother but increases the market time of the father.

On the labor force participation of older children, a joint schooling-labor force participation model for children 10 to 24 years old was estimated using a merged Family Income and Expenditure Survey (FIES), Labor Force Survey (LFS) and Functional Literacy Education and Mass Media Survey (FLEMMS) for 1994 in Orbeta (2000). He finds that family size does not significantly affect school attendance but positively affects labor force participation. Corroborating this result, Villamil (2002), using the 1995 Child Labor Survey, provides evidence that the probability of children 5 to 14 years old not going to school but working is positively related to the number of young children (0-9 years) but is negatively related to the number of older children (15-17 years) in the family.

On the aspect of the impact of rapid population growth on wages, Bloom and Freeman (1988) find that for the period 1965-1985, developing countries were able to shift the labor force from low productivity agriculture to higher productivity industry and services sectors despite the rapid growth of their population. This shows that there may not be much depressing impact on wages. They caution, however, that such adjustments may become increasingly difficult in the future. In the case of the Philippines, studies (e.g., de Dios et. al. 1993) reveal slow growth in employment opportunities. This is further buttressed by the high open unemployment and underemployment rate that did not spare even educated workers (Orbeta and Pernia 1999). Finally, the continued flow of overseas contract workers is testimony to the

lack of employment opportunities domestically. All of these indicate that the Malthusian negative impact of rapid population growth on poverty via the distribution effect may be operating.

Conversion effects

While primarily the evidence on conversion effects would come from household-level analysis, there are indications that can be gleaned from the aggregate level. For instance, there are countries where per capita incomes or per capita consumption are lower but indicators of well-being are better than those with higher incomes. Sri Lanka, for instance, has lower per capital income than Indonesia, the Philippines, and Thailand (Table 6), but it has better infant mortality record and school attendance, particularly at the secondary level. We now turn to the household-level evidences.

Fertility preferences

An empirical regularity one finds worldwide is that poverty incidence is always higher among households with larger family size. The Philippines is no exception, as shown in Table 7. The question is whether the poor rationally choose to have large families. There are indeed conceptual reasons and even empirical evidence that the poor may prefer to have large families. These could be any or a combination of the following: they put high value on the perceived benefits of having many children; they put low value on the costs of having them; or they find small probability in enjoying the alternatives.

Among the commonly cited reasons are that children add to family income, provide old-age security, and that fewer and better-educated children with better earning prospects may be just a remote option for the poor. The reasons could include requiring what to them could be unaffordable savings, delayed (or heavily discounted) and risky returns, and very high opportunity cost from foregone child labor income.

However, Birdsall et al. (2001) challenge the belief that the poor rationally choose to have large families and require proofs on the following which, which have been highlighted by recent studies: 1) that the choices of the poor are not limited; 2) that the poor have the required inputs to make an informed choice; 3) that men do not dominate the choice over the number of children while not fully sharing the costs; (d) that there is no higher prevalence of unwanted pregnancies among the poor compared to the nonpoor; and 5) that fertility

has increased among the very poor who have good access to health and family planning information and services. It would require intensive tests to know the answers to these questions. However, the answers may be gleaned from available data on the Philippines.

Table 8 shows the differential contraceptive practice of the poor and the nonpoor. It must be noted that the classification, due to data limitations, may be a bit loose. But if contraceptive practice is an indication of the extent of control over fertility, the table shows that, from either the actual contraceptive practice or access to family planning services, the poor may have less control over their fertility than the nonpoor. Using a finer disaggregation of households, Table 9 shows that the disparity in the use of modern contraceptives by poor and nonpoor households is even more pronounced. If access and contraceptive practice were even for both the poor and the nonpoor, then the poor, as shown in Table 6, could have large family size by choice. Finally, the evidence on unwanted fertility and unmet need for family planning points to the disparity between the poor and the nonpoor. Pamaran and Ramos-Jimenez (2000), using the 1993 National Demographic Survey (NDS), the 1998 National Demographic and Health Survey (NDHS) and a wealth index, show that women in the poorest 20 percent of households are 27 percent more likely to have unwanted fertility and 122 to 154 percent more likely to have unmet need[6] for family planning compared to women in the richest 20 percent of households. Table 10 shows a similar story using data from the recent 2002 round of the Family Planning Survey. The table shows that women from the poorest households have almost twice as much prevalence of unmet need for family planning as do women from the richest households.

Economies of scale in consumption

On the aspect of economies of scale in consumption, evidence on both sides of the argument exists. It has been shown that the negative impact on consumption of large family size will not hold under some plausible assumptions about economies of scale in consumption (e.g. Lanjow and Ravallion 1995 for Pakistan; Anand and Morduch 1996 for Bangladesh). But there are also pieces of evidence on the congestion effects. King (1987), for instance, notes crowding in the poor's small dwellings.

[6] Total of spacing and limiting unmet need.

Table 7. Poverty incidence by family size

Family Size	Poverty Incidence					
	1985	1988	1991	1994	1997	2000
National	**44.2**	**40.2**	**39.9**	**35.5**	**31.8**	**33.7**
1	19.0	12.8	12.7	14.9	9.8	9.8
2	20.0	18.4	21.8	19.0	14.3	15.7
3	26.6	23.2	22.9	20.7	17.8	18.6
4	36.4	31.6	30.1	25.3	23.7	23.8
5	42.9	38.9	38.3	31.8	30.4	31.1
6	48.8	45.9	46.3	40.8	38.2	40.5
7	55.3	54.0	52.3	47.1	45.3	48.7
8	59.8	57.2	59.2	55.3	50.0	54.9
9 or more	59.9	59.0	60.0	56.6	52.6	57.3

Sources of basic data: Family Income and Expenditures Surveys, 1985-2000, NSO; Reyes 2002.

Table 8. Differential family planning practice by socioeconomic class

Source	Poor	Non-Poor	Total	Poor/N-Poor Ratio
Contraceptive prevalence				
FPS 2002\a				
Modern	29.5	37.6	35.1	0.8
Traditional	13.4	13.9	13.8	1.0
Any method	42.9	51.5	48.8	0.8
FPS 2000\a				
Modern	26.3	35.0	32.3	0.8
Traditional	13.9	15.1	14.7	0.9
Any method	40.1	50.1	47.0	0.8
APIS 1998\b	40.5	46.2	44.1	0.9
APIS 1999\b	33.7	37.0	35.8	0.9
Access to family planning services				
APIS 1998\b	85.2	90.7	88.7	0.9
APIS 1999\b	89.1	93.1	91.7	1.0

[a] *Socioeconomic status is based on a score derived from questions about housing convenience/ durable goods*

[b] *Socioeconomic status based on income deciles: poor = lowest 40%; nonpoor=highest 60%*

Notes: FPS - Family Planning Survey
APIS - Annual Poverty Indicators Survey

Table 9. Contraceptive practice and sources, by asset quintile, 2000

	Poorest	L. Middle	Middle	U. Middle	Richest	Total	Poor/Rich Ratio
Contraceptive Prevalence							
Any Method	37.6	47.6	50.9	51.8	47.5	47.0	0.8
Modern	24.0	32.6	35.0	36.0	34.1	32.3	0.7
Traditional	13.6	15.0	15.9	15.8	13.4	14.7	1.0
No Method	62.4	52.4	49.1	48.2	52.4	53.0	1.2
Source of Modern Methods							
Government	90.7	84.8	78.2	69.0	50.9	73.8	1.8
Private	8.8	13.4	19.4	29.3	47.5	24.6	0.2
Others	0.2	1.4	1.6	1.2	0.9	1.1	0.2
DK	0.2	0.4	0.8	0.5	0.8	0.5	0.3
Reason for not using contraceptives							
Wants children	14.6	18.1	18.4	23.5	25.4	19.8	0.6
Lacks knowledge	6.3	2.8	2.2	1.3	1.4	3.0	4.5
Method-related	27.9	28.9	29.7	24.7	19.0	26.1	1.5
Opposition to use	9.9	6.3	3.9	3.4	3.5	5.6	2.8
Relating to exposure	28.7	32.5	35.7	37.4	43.6	35.3	0.7
Others	12.6	11.5	10.1	9.7	7.3	10.3	1.7

Notes: Method-related refers to health concerns, side effects, inconvenient to use, costs too much, hard to get, etc.; Opposition refers to those opposed to family planning and prohibited by religion; Others refer to fatalistic, etc.
Source: Orbeta et al. (2003); Raw data from NSO, FPS 2000.

Table 10. Unmet need for family planning by asset class, 2002

	Asset Class						Poor/Rich
	Poorest	L. Middle	Middle	U. Middle	Richest	Total	Ratio
Total	26.9	22.2	17.2	18.0	15.6	20.0	1.7
Spacing	13.6	10.8	7.9	9.6	8.7	10.1	1.6
Limiting	13.4	11.4	9.3	8.3	6.9	9.9	1.9

Source: Author's calculation
Basic data: FPS 2002. Methodology used to compute the asset classes is described in Orbeta et al. 2003.

Investments in human capital

Empirical evidence that high fertility is associated with decreasing investments in education and health abounds. King (1987) provides a review of studies on the effect of population change on household welfare. The conclusions include the following: 1) children in large families perform worse in school; 2) children in large families have poorer health, lower survival probabilities, are less developed physically; 3) impact on parental welfare is not as clear. These conclusions are substantially echoed in a more recent review of studies with some added dimensions (Lloyd 1994). In particular, the study found that the adverse impact on children born into large families can be grouped into: 1) resource dilution, with each child getting a smaller share of family resources, including income, time, and maternal nutrition; 2) the "opportunity effect" through diminished access to public resources, such as health care and education; 3) the "equity effect," which means unequal distribution of resources among siblings; and 4) the "intergenerational effect," with the adherence to the traditional role affecting the transmission of opportunities to the next generation.

Orbeta (2002) reviews several more studies showing similar results in the Philippines. High fertility does not affect school participation of younger children (7-12 years old) but negatively affects school participation and attainment of older 13-17 years old children (Herrin et al. 1993). Bauer and Racelis (1991) corroborate this result on older children. DeGraff et al. (1993) particularly emphasized the large negative impact on boys. In addition, it affects not only the school comple-

tion rates of children but also the expenditure per child (Bankosta and Evenson 1978).

Vulnerability

Finally, there is growing evidence that larger family size makes it difficult for poor families to get out of poverty and for the currently nonpoor to be more prone to slide below the poverty threshold. Glewwe and Hall (1998), for instance, using panel data from Peru, find that families that have more children are more vulnerable to macroeconomic shocks. Vulnerability is defined as changes in the one's socioeconomic status. Using the 1997 FIES, and the 1998 and 1999 Annual Poverty Indicator Survey (APIS), Reyes (2002) shows very revealing poverty dynamics. Tracing the movement of families in and out of poverty over this three-year period, she finds that 46 percent of the families are not affected and remain nonpoor throughout while 22 percent remain poor. Table 32 in her paper is quite revealing. It clearly shows that as one goes from being poor to being nonpoor, the family size declines. It clearly implies that getting out of poverty becomes harder with larger family size.

Implications for policy

Several themes can be gleaned from the foregoing discussions to guide policy, namely:

One, while it would be wrong to attribute solely to high fertility the high incidence of poverty in the country, recent research provides even stronger evidence showing the important roles that demographic changes play in development in general, and poverty alleviation in particular. At the aggregate level, it retards the growth in per capita income as it lowers savings rates and investments in physical and human capital. An even more overwhelming evidence of the depressing impact of high fertility, particularly on savings and human capital investments, exists at the household level. The impact through the distribution channel has also been found to be equally potent by recent research, showing that it skews the distribution of income against the poor. Finally, household level studies continue to reveal the deleterious effect of high fertility on the attainment of wellbeing of the poor given their incomes. These results should further strengthen the resolve of concerned sectors like the government to include, as part of the poverty alleviation package, programs to improve fertility management of poor couples.

Two, while it has been argued that the observed pattern of the poor having a larger family size is the result of their rational choice, a closer look at the data reveals that this can only be partially true in the case of the Philippines. National survey data reveals that while wanted fertility—the closest indicator of fertility preferences—of women from poorer households is higher compared to those from richer households, it also shows that the poor also have higher unwanted fertility. The higher unwanted fertility of the poor is explained by limited access to family planning and allied services, lower contraceptive prevalence rates, and higher unmet need for family planning. An effective family planning program is thus needed to improve the poor's control over their fertility and enable them to realize their fertility goals.

Three, current fertility choices not only have contemporary but also intergenerational impact. There is overwhelming evidence, even during the 1980s, when analysts doubted the importance of fertility regulation in development, that high fertility leads to decreased investments in human capital. This has been identified as the main engine of intergenerational transmission of poverty. It might too late to wait for the poor to reduce their fertility to solve this problem. This requires proactive subsidy and better targeting of public services to improve human capital investments (e.g., education and health) of the poor. It is worth noting that this has both short and long-term effects. In the short term, it shields the poor from deprivation due to their current economic status. Over the long term, it helps stop the intergenerational transmission of poverty. These interventions have good socioeconomic returns apart from dealing with the externalities of fertility decisions.

Four, it has been shown by decomposition analysis that in the Philippines, growth is the primary contributor to the decline in poverty incidence while crosscountry analysis considers the lowering inequality as playing a secondary role. Sustained economic growth should therefore remain the primary strategy of development in the immediate term, with lowering inequality as the secondary strategy. On the role of demographics, even those who believe in the important role it plays in development are quick to add that these are mostly potential benefits. A more conducive economic environment is required to translate these into reality. This is clearly demonstrated by the difference in impact of similar demographic transitions unfolding in East Asian and Latin American countries. In East Asia, the demographic transition

facilitated rapid economic growth. In Latin America, on the other hand, a more modest economic growth had been achieved.

Five, globalization introduces at least two elements that have important implications, as enumerated by the foregoing discussions: 1) it creates opportunity, and 2) it means rapid changes in the economic environment. At the aggregate economy level, to benefit from opportunities created by globalization, the economy must be able to shift resources to sectors where demand is expanding from sectors where demand is contracting. To the extent that high population growth deters investments in both physical and human capital, it means it can hinder these needed shifts. Similarly, at the household level, those who have fewer (and by all indications well endowed) children, will have better chances of benefiting from globalization. This will clearly contribute to worsening inequality. Finally, recall that increases in family size increases the vulnerability of households to changes in economic conditions as well as to slippage into poverty. To the extent that globalization implies more rapid changes in the economic environment, this means increasing vulnerability for those who have large families.

Six, all of the foregoing point to the important role demographic changes play in development in general, and poverty in particular. They provide more than enough justification for government to help couples achieve their desired fertility and promote small family size.

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