International Conference

The many dimensions of poverty
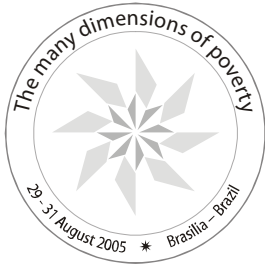
Multidimensional Poverty in the Philippines: Trend, Patterns, and Determinants

Conference paper

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Multidimensional Poverty in the Philippines: Trend, Patterns, and Determinants

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Abstract

This paper gives a brief survey of the literature on multidimensinal poverty in the Philippines. Then using provincial-level indices, including the HDI and the HPI, shows that there is a geographic pattern in the levels of the welfare indicators across provinces. In particular northern provinces, especially in the vicinity of Metro Manila appear to dominate those in the southern provinces, particularly provinces in the Autonomous Region of Muslim Mindanao. Regression results show that geography, infrastructure, and political factors play a role in explaining variation in multidimensional poverty levels.

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1. Introduction

At least nominally, poverty in its multiple facets and not just income poverty has been the stated concern of the Philippine government since 1992. All the Medium Term Philippine Development Plans (MTPDP) – a document presented by the president at the beginning of his/her term in office that sets out his/her government's development goals as well as its poverty reduction framework – from this period referred to *human development* goals and not just income poverty targets.[1]

More recently, in the current administration's flagship poverty project, acronymed KALAHI-CIDSS, loosely translated as Arm-in-Arm Against Poverty, the use of a composite index based on income, food consumption, clothing, shelter, disaster vulnerability, and citizen's participation was utilized to come up with a ranking that is used to pick the communities that will be covered by the project. The project involves community funding support for the likes of road, water, classroom, health and day care center projects. Yet, despite its conceptual and practical importance, the literature devoted to multidimensional poverty in the country lags, especially compared to income poverty, although a growing literature is increasingly becoming available (see for examples HDN 1994, 1997, 2000, 2002, Balisacan and Fujisaki 1999, Reyes 2003) ADB 2005. Data constraint has bee one important reason for this. For instance, whereas the main data source for income poverty studies – the Family Income and Expenditures Survey (FIES) conducted by the National Statistics Office – is conducted regularly at relatively frequent intervals (every 3 years beginning 1985),[2] many of what are considered important non-income indicators of well-being such

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[1] The implementations of which have been criticized as weak and too politicized (ADB 2005).
[2] The FIES, however, also contains some non-income indicators at the household level such as the type of housing, sanitation, and access to water, and education of the household head.

as literacy rates, mortality rates, life expectancy, and nutrition status of children, access to health and education facilities are obtained either at long intervals of time (in the case of information from the full census which is conducted only every 10 years in the country, although a partial one is conducted on the 5th year) or irregularly such as in the case of the literacy surveys (held only twice in the last 15 years) and the nutrition surveys (held thrice in the last 15 years by two different agencies).   Another important reason is the many more complications that accompanies multidimensional poverty studies as opposed to income poverty studies, especially when a composite index is one of the end goals, these includes the choice of dimensions to consider, the thresholds to use (particularly for categorical indicators), the appropriate weighting to be utilized, etc.

The Philippine Human Development Network's *Philippine Human Development Report* (PHDR) maybe considered the pioneering work on multidimensional poverty in the country, particularly in terms of capturing a broad spectrum of welfare dimensions and arriving at a composite index at the sub-national level. The Philippines is currently comprised of 79 provinces grouped into 17 regions.[3] The first PHDR themed 'Human Development and People's Partcipation in Governance' was published in 1994.   Following United Nation Developent Programme's methodology in the global Human Development Reports, the 1994 PHDR came up with a *regional* human development index (HDI)[4], including of course its sub-indices on life

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[3] *Currently*, because every so often new provinces and regions are created from the division of old ones. In the mid-1980s there were only 13 regions in the country and 70 provinces. The regions, however, except for one – the Autonomous Region of Muslim Mindanao, are merely geographical groupings with no administrative or political relevance. On the other hand, a province is a political subdivision headed by a governor.

[4] The HDI here is computed is an equal-weighted average of sub-indices on achievement in life expectancy, education (enrolment rate of primary and secondary school-age population and functional literacy – the latter replaced in more recent computations by the high school graduate ratio for lack of new data), and income. Note that this differs from the global HDR in its use of enrollment rates only for primary and secondary levels, the use of functional literacy instead of simple literacy, and in the

expectancy, education, and income. The second PHDR themed 'Women and Gender in Development', which came out in 1997, extended the indicators included in the report by including also *regional* indices on the HDI, the human poverty index (HPI)[5], and the gender-related HDI (GRDI)[6]. The third PHDR published in 2000, with the theme 'Quality, Access, and Relevance in Basic Education', took it a step further by computing for a *provincial* HDI. This localized human development indicator was deemed important particularly in making local leaders and the people more accountable for their performance (HDN 2000). In 2002, the fourth PHDR with the theme 'Work and Well-being' was published. This was a further extension, as the computation of *provincial-level* HPI and GRDI was added to provincial HDI. A fifth PHDR, with a theme on human security, is set to be launched later this year.

Other attempts to come up with sub-national multi-dimensional poverty estimates for the country include the Social Watch Philippines' Quality of Life Index comprising of three indicators, namely, under-5 nutrition rate, attended births, and elementary cohort survival rate. Similar to the PHDR computed indices, this index was also computed at the level of provinces. The Minimum Basic Needs (MBN) Indicator System, developed by the Philippine Institute for Development Studies and the University of the Philippines School of Economics was another effort towards a multidimensional view of poverty. The MBN Indicators System

more recent ones in the use of the high school graduate ratio. The reasons for these differences are both conceptual and practical: tertiary level was excluded in the enrolment rates as students there are more mobile and more likely to study in provinces other than their home possibly leading to misleading figures, especially considering there are only a few areas that maybe classified as centers of education in the country; functional literacy was preferred to simple literacy as it appears to be the more relevant concept for human development; and the high school graduate ratio was used because literacy rates ceased to be generated by government (HDN 2000).

[5] The HPI is a weighted average of deprivations in 3 dimensions of human development as given by *a long and healthy life* (measured by probability at birth of not surviving to age 40), *knowledge* (measured by functional illiteracy), and *a decent standard of living* (as measured by the equally-weighted average of percent population not using improved water sources and percent of underweight children under five).

[6] The GRDI is the HDI adjusted for inequality between the sexes, with a higher GRDI indicating a more equitable distribution of human development .

comprised of a set of 33 indicators covering a) survival needs, as given by food and nutrition, health, water and sanitation, and clothing, b) security needs, as given by shelter, public safety, income and employment, and c) enabling needs, as given by basic education and literacy, people's participation, and family care, and psychosocial needs (Constantino 1999). The Micro Impacts of Macroeconomic Adjustment Policies (MIMAP) Indicator System is similar to the MBN Indicator System but the indicators were pared down to 16 instead of 33, covering health, nutrition, water and sanitation, income, shelter, peace and order, basic education and literacy, and community participation. However, in contrast to the PHDR computed indices and the Quality of Life Index, the MBN and MIMAP Indicators were not aggregated to a single composite index other than in the simple case of counting the number of indicators a community is deemed to have failed. Moreover, both the MBN Indicators System and the MIMAP indicators system, unlike the HDI, HPI, GRDI , and even the Quality of Life Index were never generated in a consistent manner across regions and provinces but were utilized mainly for small community monitoring. More recently, a number of the indicators in the MBN were adopted in the nationwide Annual Poverty Indicators Survey, began in 1998 and to be conducted every year the FIES is not, thus enabling consistent comparisons for these indicators across regions and provinces

Other multidimensional welfare studies in the country take the form of Millenium Development Goals (MDG) studies, (see for examples Monsod *et al* 2004, Manasan 2002, NEDA 2005). These studies conclude that the country as a whole is on track to achieve some of the goals such as on access to water, gender disparity in education, under 5 mortality rate, the spread of diseases, and unlikely to achieve others such as on underweight children, maternal mortality, completion of primary education. Results on the income poverty goal are ambiguous. On the other hand, and perhaps more

importantly, the studies also find that there is very wide disparity across regions and provinces in terms of achieving these goals, and that a pattern to these disparities exist such as that climate, topography, and other spatial factors as well as a history of conflict in the locality are highly correlated to levels of achievement (Monsod *et al* 2004).

The rest of the paper is structured as follows. The next section presents some stylized facts about the trend and patterns of poverty in its different aspects in the Philippines based on existing measures. The third section, via regression analysis, makes an attempt to identify the determinants of the observed patterns of disparity at the provincial level. The last section concludes.

2. Trend and Patterns

2.1. National

Based on the United Nation Development Programme's various Human Development Reports (HDR) the Philippines is a country that is classified as poor in income but relatively better off than most similarly situated countries in other non-income indicators of welfare, particularly those pertaining to education. The 2004 HDR, for instance, ranks the Philippines 83rd in terms of the HDI, which puts it in the upper half of the *medium human development* countries. A closer examination of the index's components reveals, however, that the per capita GDP of the country is actually slightly lower (2%) than the average for *medium human development* countries, its life expectancy only a bit higher (4%), but its adult literacy rates and combined gross enrollment ratio are very much higher (15% and 27%, respectively) thereby driving its ranking upwards.

The same is true if one looks at the HPI, where the country is ranked 28th among about 95 developing countries, again enabled mainly by the country's relatively lower education deprivation (adult

illiteracy) as well as lower proportion of people expected to die before the age of 40. These are no small consolation for a country whose culture places great value on education, while its economy appears trapped in an endless cycle of boom and bust (De Dios 2000), although doubts have been cast on the validity and value of even this 'achievement'.[7]   Across time, the indicators for the country are improving but lagging behind improvement in other countries, as evidence by its deteriorating ranking in the HDI index, from say 77th in the 1999 report to 83rd in the 2004 report.

2.2. Sub-national

The Philippines is an archipelago of about 7,100 islands grouped, for political administration purposes into three island groups subdivided into 17 regions, seventy-eight (79) provinces, eighty-two (82) cities, 1525 municipalities and 41,939 villages or "barangays". The three island groups are Luzon, Visayas, and Mindanao. Luzon is divided into 8 regions, Visayas into 3 regions, and Mindanao into 6. In Luzon are Northern Luzon or "Ilocos" (Region 1), the Cordillera Administrative Region (CAR) or the "Cordilleras", Cagayan Valley (Region 2), Central Luzon (Region 3), CALABARZON (Region 4A), MIMAROPA (Region 4B), the Bicol Peninsula (Region 5) and the National Capital Region (NCR), or Metro Manila, the commercial and political center of the country. In the Visayas are Western Visayas (Region 6), Central Visayas (Region 7) and Eastern Visayas (Region 8). Mindanao hosts Western Mindanao (Region 9), Northern Mindanao (Region 10), Southern Mindanao (Region 11), Central Mindanao (Region 12), CARAGA (Region 13), and the Autonomous Region of Muslim Mindanao or ARMM.

The Philippines is one of the few countries in the region where poverty, and especially human development statistics are generated

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[7] The Philippine Human Development Report 2000 is devoted in large part to analyzing the many things wrong with the country's education system, particularly its quality.

at the level of provinces (or its equivalent in other countries)[8]. As mentioned in the previous section, this is of more than academic interest as these statistics are used as vital inputs in the allocation of the budget. For instance, in the previously mentioned flagship poverty project of the current administration (the KALAHI), the 20 provinces that made the cut-off eligibility for the project (at least initially) were the poorest 20 provinces according to official income poverty rankings. This was the subject of some criticism as alternative poverty rankings, even that using income poverty also (but using differently computed poverty lines, see Balisacan 2003), yield a significantly different set of 20 provinces.

Table 1 presents Spearman rank correlations of 4 different welfare indicators, the HDI, HPI, GRDI, and income poverty incidence with provinces as the unit of analysis. The provincial level indicators are in Appendix Tables 1 and 2. The only really high correlation was between HDI and GRDI, which is of course to be expected except in the extreme case of stark gender disparities across provinces. On the other hand, the correlation between HDI and HPI, two alternative multidimensional welfare rankings, is quite low at only -0.53. The correlation between HPI and income poverty is even lower at only 0.39. These tells us that the ranking across different dimensions of poverty across provinces vary significantly. Furthermore, from a policy viewpoint, these indicate that using these different rankings for targeting purposes would yield different sets of priority provinces. In fact, a simple experiment of counting the intersecting bottom 20 provinces using the different indicators shows that the HDI and HPI identify a common 12 provinces only, the HDI and income poverty only 13 provinces, and the HPI and income poverty only 9 provinces – less than half the total.

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[8] It must be noted that criticisms have been put forward on the reliability of the statistics at this level.

Table 1. Spearman's Rank Correlations of Provincial Welfare Measures*

Indicator	HDI	HPI	GRDI	Income poverty incidence
HDI	1	·	·	·
HPI	-0.53	1	·	·
GRDI	0.98	-0.57	1	·
Income poverty incidence	-0.84	0.39	-0.82	1

*Using provincial level data as unit of analysis

Still, there are observable patterns. Table 2 presents the welfare indicators by region. Note that these regional figures were obtained by getting the population-weighted average of the provincial level data. The order in which the regions are listed in the table has a rough significance: it approximately represents the regions' geographical location, with those provinces at the top being the northernmost regions and those at the bottom being the southernmost regions. NCR or Metro Manila is considered both a province and a region in itself. What the table shows is that, whichever indicator one is looking at – whether HDI, HPI, GRDI, or even income poverty, the lowest welfare levels are found in ARMM by a wide margin. In fact, the 5 provinces of ARMM have the 5 lowest HDIs, while 3 of its provinces have also the 3 lowest HPIs – one has the 6th lowest and the other one is not there only because it has no measurement for one component of the index[9]. ARMM, located at the southwestern tip of Mindanao, is where majority of the country's Muslim population is found. It is also the site of a long-standing armed conflict between Muslim secessionists and government forces. Monsod *et al* (2004) found the presence of armed conflict as a significant determinant of poor performance in the Millenium Development Goals. On the other hand, NCR and surrounding provinces comprising Regions 3 and 4A are in the best

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[9] This is Basilan which has no undernutrition data, reportedly because it was skipped by the survey due to armed conflict in the area.

position in almost all indicators, with Region 1 as the only other region approaching their levels. But even within some regions large disparities can exist. For instances, provinces of CAR and Region 12 maybe found both at the top of the rankings and at the bottom of the rankings in terms of HDI, and provinces of Region 5 and Region13 maybe found at the top and bottom of the rankings in terms of HPI.

Table 2. Regional Welfare Indicators (2000)*

Region**	HDI	HPI	GRDI	Income Poverty Incidence***
CAR	0.620	19.5	0.574	20.1
1	0.639	12.8	0.602	20.2
2	0.567	14.7	0.539	29.6
3	0.634	11.7	0.591	16.4
NCR	0.830	9.6	0.732	5.6
4A	0.669	12.1	0.621	14.7
4B	0.535	15.3	0.510	39.2
5	0.523	17.8	0.503	49.7
6	0.587	20.0	0.552	28.1
7	0.563	17.7	0.537	39.3
8	0.519	18.4	0.495	46.8
9	0.530	23.6	0.505	49.0
10	0.606	16.6	0.558	31.2
11	0.594	21.7	0.553	23.1
12	0.569	20.5	0.538	32.5
13	0.520	17.4	0.499	33.9
ARMM	0.395	31.1	0.381	58.9

*Regional figures are population-weighted averages of provincial figures in Appendix Table 1.
**CAR – Cordillera Administrative Region; NCR – National Capital Region; ARMM – Autonomous Region of Muslim Mindanao
***Based on fixed level of living poverty lines and per capita expenditure.

A further point worth considering here is to what extent the HDI and HPI actually encapsulate information on multidimensional poverty, even on their own terms. Or alternatively, to what extent they are dominated both in magnitude and value by any of their components. Table 3 shows the correlation HDI to its individual components, as well as the correlation of HPI to its individual

components. What may be seen is that the HDI has the highest correlation with the per capita income index at 0.94 using Pearson's correlation, and 0.92 using Spearman's rank correlation. This is similar to results across countries (McGillivray 2003). On the other hand, correlations of HDI with the life expectancy index and the education index are also high at 0.74 and 0.87, respectively. However, when looks at the coefficient of variation of each of the components, one sees that the income index dwarfs that of life expectancy and education almost 4-to-1. This means that whereas the values of life expectancy and education are relatively close across provinces, that for income is highly disparate, which implies that the variation in the latter has the largest influence on the relative rankings. In the case of the HPI, the highest correlation of the index is with the knowledge component (adult illiteracy) at 0.90 using Pearson's and 0.84 using Spearman's, although the standard of living (no safe water and under-5 under-nutrition) is close behind at 0.86 using Pearson's and 0.84 using Spearman's. On the other hand, its correlation with the health component (probability at birth of not surviving to 40) is at 0.76 using Pearson's and 0.60 using Spearman's. The coefficient of variation, meanwhile, is highest for the standard of living component, again taken to imply that the variation in this component having the highest impact on the relative rankings of the provinces in the composite indicator. However, it must be noted that the disproportion in the coefficient of variations is not as large as in the HDI.

Table 3. Correlation Between HDI and its components and HPI and its components*

	HDI				HPI		
Components	Pearson's Correlation with HDI	Spearman's Correlation with HDI	Coefficient of Variation	Components	Pearson's Correlation with HPI	Spearman's Correlation with HPI	Coefficient of Variation
Life expectancy index	0.737	0.675	0.10	Health	0.759	0.597	0.23
Education Index	0.874	0.836	0.11	Knowledge	0.904	0.844	0.48
Income Index	0.947	0.917	0.41	Decent standard of living	0.859	0.836	0.60

*See footnotes 4 and 5 for a more detailed description of the components.
**We do not show anymore that for GRDI because the results are almost identical with HDI.

3. Determinants

In this section we seek to identify the determinants (or at very least the strong correlates) of provincial-level multidimensional poverty in the Philippines, where multidimensional poverty is as measured by the human poverty index and the human development index. We pursue this through the usual route or regressing these indicators against a set of explanatory variables, where the key is to try to avoid endogeneity problems by choosing explanatory variables that are conceptually exogenous to the left-hand side variables. This we tried to do, but of course, not with absolute success. However, where we include explanatory variables that maybe endogenous to the explained variables, we chose values of the former that predate by a significant number of years the HDI and HPI measures.

Following the framework of Balisacan and Pernia (2002) and Monsod *et al* (2004), we examine multidimensional poverty in relation to *geographical/topographical factors*, *infrastructure*, and *political economy variables*.[10]

Geographic factors could affect different human well-being in a variety of ways. Climate and topography, for instance, affect livelihood patterns, food production, and shelter. Climate is also intimately related with disease burdens (such malaria in tropical

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[10] Balisacan and Pernia (2002) traced the determinants of per capita expenditure level changes across provinces, whereas Monsod *et al* looked at the MDGs.

areas, meningitis in mountainous areas) and health. Difficult terrain, as well as frequent inclement weather also makes children's access to school more grueling. One may thus expect that the more severe the environment, the worse poverty is in its different aspects in an area. In our regressions below, geography is represented by dummies for climate type (4 types, see Appendix Table 3), as well as dummies for whether a province is predominantly mountainous or predominantly coastal.[11]

Infrastructure, meanwhile, facilitates trade and travel, raising income levels. Infrastructure, say in the form of a good road network also facilitates the construction of, and transport to, further infrastructure such as markets, school buildings, and health centers. One would thus expect that the better the infrastructure in an area, the lower its multidimensional poverty. Here, infrastructure is represented by road density and an indicator variable for the presence of international ports in the province. In addition, the population density, which is closely linked to the level of urbanization in an area, is included as an additional proxy infrastructure variable.

It is also easy to imagine that political factors would affect well-being. Good governance, for instance, should lead to better welfare for the constituents. On the other hand, the presence of armed conflict in an area, insofar as it represents a direct threat to life and health, impedes access to education and health facilities, and represents a grave psychological burden, should be detrimental to well-being. In our regressions, as measures of good governance, we include a measure for the *extent of local political dynasty* and also provincial *per capita budget expenditure on education*. To represent conflict, we include a dummy for the presence communist armed insurgence (CPP-NPA) in the area and also a dummy for the

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[11] See Appendix Table 3 for a complete list and description of the regression variables.

Autonomous Region of Muslim Mindanao, a historically contentious region and the base of Muslim insurgents.

Table 4 gives the regression results. Looking at the results for HDI first, it can be seen that geography matters. Provinces predominantly under climate types 2,3, and 4, everything remaining the same, generally have lower HDIs than those under climate type 1. Climate type 1 is where there is a distinct dry and wet season (6 months dry, 6 months wet). All the rest of the climate types involve a distinctly longer wet season. On the other hand, the dummies for mountainous provinces as well as coastal provinces were insignificant. Infrastructure also explains HDI. The population density variable is also significant at the 1% level, although the road density and international port dummies are not. Political variables, namely political dynasty and the dummy for ARMM are also highly significant. In the case of the former, inasmuch as political dynasty is positively correlated with poor governance (the widely held belief in the country), the negative coefficient shows that it also reduces human development in the area. In the case the ARMM variable, the coefficient attached is very high (in absolute value), indicating considerably lower HDIs for the provinces in this region even after controlling for all the other variables.

Looking at the results for HPI, it can be seen that just as in the case for HDI, climate is highly significant with those under climate types 3 and 4 having significantly higher human poverty than those under climate type 1, *ceteris paribus*. On the other hand, the mountainous and coastal dummies are again insignificant. Among the infrastructure variables, road density is significant with a negative coefficient, meaning higher road density is associated with lower human poverty. The two other infrastructure variables are insignificant. Among the political variables, the dummies for communist insurgency and ARMM are positive and highly significant,

and as these two variables indicate the presence of long-standing (even if intermittently dormant) armed conflict, maybe taken to mean that conflict leads to higher human poverty. On the other hand, the dynasty and education expenditure variables are insignificant.

Table 4. Regression Results

Variable	HDI 2000		HPI 2000	
	Coeff	p-value	Coeff	p-value
Climate type 2	-0.0771	0.00 ***	1.86	0.25
Climate type 3	-0.0478	0.01 ***	3.48	0.02 **
Climate type 4	-0.0654	0.00 ***	4.18	0.01 ***
Mountainous	0.0052	0.80	0.58	0.59
Coastal	0.0104	0.56	1.35	0.45
International port	0.0095	0.69	0.20	0.86
Road density 1990	0.0178	0.54	-4.64	0.02 **
Population density 1990	0.0002	0.01 ***	0.00	0.44
Dynasty	-0.0581	0.02 **	1.04	0.65
Education expenditure per capita	0.0000	0.17	0.00	0.80
Communist insurgency	-0.0195	0.16	2.44	0.06 *
ARMM	-0.1541	0.00 ***	18.57	0.00 ***
Intercept	0.5499	0.00	16.32	0.00
No. of observations	72		72	
R^2	0.673		0.668	

*significant at the 10% level
**significant at the 5% level
***significant at the 1% level
****Regressions were done in Stata 8 using the robust method, which uses White's adjusted standard error estimates. Diagnostic tests on multicollinearity, omitted variables, and normality of residuals were made and except in the case of the normality of residuals in the HDI regression, all were passed.

4. Summary and Conclusion

This paper has given a brief survey of the limited but growing literature in the Philippines on multidimensional poverty. The pioneering and most extensive work on this area in the country is by the Philippine Human Development Network in coordination with the United Nations Development Programme in the recurring Philippine Human Development Reports (PHDR). The PHDR reports HDI, HPI, GRDI and other welfare indicators in the country at the

provincial level. This is noteworthy as the government of the Philippines uses poverty indicators as an input in its budget allocation, particularly in its flagship poverty project.

If one measures multidimensional poverty by the HDI, GRDI, and the HPI, then on the basis of these, one may conclude that there is a geographical pattern in the multidimensional poverty in the Philippines. Those in the southern provinces (although there are significant exceptions), especially in the ARMM have lower welfare levels than those in the northern provinces, particularly compared to Metro Manila and surrounding provinces.

Looking at the indicators themselves, it was observed that the correlation between HDI, HPI, and income poverty, while highly significant, is not very high. This means that if one is concerned with getting a broad picture of the different facets of poverty across provinces, merely looking at income poverty will not suffice. From a policy standpoint, for government targeting purposes, significantly different sets of poorest provinces will be selected depending on the poverty measure used, whether HDI, HPI, or income poverty. On the other hand, it was also shown that the per capita income component appears to dominate the relative rankings of the HDI, while no such observation on any component can be made about the HPI.

Regression results show the geography, infrastructure, and political factors are strongly related to multidimensional welfare levels. For policy, geographical features maybe made one basis for targeting, although a closer study must be made to trace the exact path/paths through which geographical factors are transmitted to welfare levels, and then design interventions appropriately. Infrastructure investment, good governance, and a quick and peaceful resolution to the armed conflicts must all be pursued to improve multidimensional welfare in the lagging provinces.

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Appendix Table 1. Provincial Welfare Indicators

Region*	Province	HDI	HPI	GRDI	Income Poverty Incidence**
NCR	Metro Manila	0.830	9.6	0.732	5.6
CAR	Abra	0.613	13.8	0.569	19.7
	Apayao	0.551	26.4	0.525	10.4
	Benguet	0.688	14.6	0.623	12.6
	Ifugao	0.512	35.8	0.497	40.9
	Kalinga	0.563	24.2	0.529	26.5
	Mt. Province	0.586	17.2	0.558	25.1
1	Ilocos Norte	0.708	15.3	0.661	6.2
	Ilocos Sur	0.614	13.9	0.577	17.0
	La Union	0.630	14.3	0.594	19.4
	Pangasinan	0.632	11.5	0.597	24.3
2	Batanes	0.649	12.3	0.605	9.9
	Cagayan	0.526	17.3	0.501	35.5
	Isabela	0.583	11.5	0.560	32.6
	Nueva Viscaya	0.634	17.9	0.574	9.3
	Quirino	0.534	16.8	0.514	19.8
3	Aurora	0.555	14.8	0.529	27.4
	Bataan	0.698	10.3	0.641	7.6
	Bulacan	0.672	9.0	0.622	9.5
	Nueva Ecija	0.577	8.9	0.542	31.8
	Pampanga	0.652	14.9	0.599	8.7
	Tarlac	0.593	13.7	0.568	20.2
	Zambales	0.639	15.9	0.597	18.2
4A	Batangas	0.633	9.2	0.607	16.3
	Cavite	0.693	8.8	0.642	10.9
	Laguna	0.690	11.6	0.630	7.7
	Quezon	0.574	16.5	0.537	29.3
	Rizal	0.758	15.4	0.690	10.5
4B	Marinduque	0.499	12.2	0.484	48.8
	Mindoro Occidental	0.539	15.3	0.496	23.4
	Mindoro Oriental	0.535	11.8	0.518	42.0
	Palawan	0.568	20.8	0.533	25.4
	Romblon	0.488	15.7	0.484	74.4
5	Albay	0.548	14.7	0.532	44.6
	Camarines Norte	0.521	22.7	0.484	49.3
	Camarines Sur	0.546	13.5	0.520	44.1
	Catanduanes	0.561	13.6	0.535	43.2
	Masbate	0.433	29.9	0.425	70.8
	Sorsogon	0.512	18.3	0.501	52.9
6	Aklan	0.553	19.5	0.528	30.7
	Antique	0.555	18.7	0.532	25.1
	Capiz	0.549	24.4	0.530	36.1
	Guimaras	0.564	24.8	0.539	16.5
	Iloilo	0.653	19.0	0.611	21.8
	Negros Occid.	0.562	19.5	0.524	31.3
7	Bohol	0.544	16.4	0.524	48.1
	Cebu	0.582	16.8	0.558	35.7

	Negros Orient.	0.528	21.9	0.489	41.0
	Siquijor	0.532	13.1	0.517	51.1
8	Biliran	0.497	17.2	0.482	47.1
	E. Samar	0.452	15.9	0.448	61.7
	Leyte	0.565	17.4	0.531	44.3
	N. Samar	0.505	22.4	0.478	48.0
	S. Leyte	0.534	14.1	0.516	32.5
	W. Samar	0.448	21.9	0.433	51.3
9	Z. del Norte	0.530	24.7	0.507	51.9
	Z. del Sur	0.530	21.0	0.500	42.2
10	Bukidnon	0.593	18.9	0.537	24.7
	Camiguin	0.545	13.7	0.531	32.3
	Lanao del Sur	0.425	35.9	0.409	48.1
	Mis. Occid.	0.545	14.6	0.511	43.2
	Mis. Orient.	0.665	13.3	0.617	22.8
11	Davao del Norte	0.541	21.1	0.505	27.3
	Davao del Sur	0.636	22.7	0.592	18.8
	Davao Oriental	0.577	19.6	0.538	28.3
12	North Cotobato	0.548	21.6	0.532	34.8
	Sarangani	0.480	22.7	0.446	43.5
	South Cotobato	0.648	20.1	0.594	25.2
	Sultan Kudarat	0.517	17.7	0.505	35.3
13	Agusan del Norte	0.540	13.8	0.516	34.1
	Agusan del Sur	0.489	23.1	0.466	34.9
	Surigao del Norte	0.524	15.4	0.510	36.9
	Surigao del Sur	0.525	17.3	0.502	30.1
ARMM	Basilan	0.420	-	0.406	63.0
	Lanao del Sur	0.425	35.9	0.409	48.1
	Maguindanao	0.431	29.4	0.400	36.2
	Sulu	0.311	37.8	0.322	92.0
	Tawi-Tawi	0.378	42.4	0.366	75.3

*CAR – Cordillera Administrative Region; NCR – National Capital Region; ARMM – Autonomous Region of Muslim Mindanao
**Based on fixed level of living poverty lines and per capita expenditure.
***Source: PHDR 2002

Appendix Table 2. HDI and HPI Components

Region	PROVINCE	Life expectancy at birth (years) 2000	% high school graduate 2000	Primary and high school enrollment rate (%) 1999	Per capita income (NCR 1997 pesos) 2000	Probability at birth of not surviving to age 40 (% of cohort) 1995	Adult functional Illiteracy rate (% age 15 and above) 1994	Popn not using improved water sources (%) 2000	Underweight children under age five (%) 1998
NCR	Metro Manila	69.2	74.3	93.8	48,816	9.6	7.6	15.1	7.1
CAR	Abra	62.6	50.8	92.6	30,062	18.1	9.9	6.2	13.1
	Apayao	61.6	31.3	94.1	26,506	20.0	29.7	47.8	7.5
	Benguet	68.7	64.7	94.8	31,968	15.4	16.1	19.9	3.0
	Ifugao	61.9	34.4	90.1	21,173	21.4	48.9	38.5	6.2
	Kalinga	61.8	38.7	93.8	26,435	24.8	29.7	6.5	16.6
	Mt. Province	62.9	43.1	95.7	27,296	20.3	18.9	3.5	4.8
1	Ilocos Norte	69.3	54.9	94.9	36,460	12.4	15.3	25.7	9.1
	Ilocos Sur	65.6	52.9	93.3	27,332	14.4	16.7	6.3	9.3
	La Union	69.8	52.9	89.7	27,151	12.5	12.6	22.6	11.1
	Pangasinan	69.1	60.0	94.5	25,332	13.0	12.6	5.3	9.5
2	Batanes	64.8	60.7	98.0	29,842	17.3	7.3	2.6	1.5
	Cagayan	65.6	37.8	89.2	19,816	16.0	13.3	30.3	11.4
	Isabela	67.3	47.1	88.4	24,278	14.2	10.6	7.7	9.2
	Nueva Viscaya	64.6	48.9	93.6	31,515	16.4	21.8	20.7	6.8
	Quirino	62.3	39.6	86.6	23,484	18.0	19.9	5.6	11.9
3	Aurora	63.0	50.1	93.3	22,058	17.8	15.8	0.3	10.7
	Bataan	68.8	62.2	94.4	33,907	12.2	11.3	3.2	4.9
	Bulacan	70.7	52.1	90.0	32,318	10.6	9.4	6.4	5.1
	Nueva Ecija	70.2	50.9	91.7	19,731	11.7	7.6	0.1	7.5
	Pampanga	71.4	53.4	91.3	28,383	10.0	20.8	0.0	6.6
	Tarlac	68.8	51.6	87.7	23,736	12.3	17.8	0.7	11.9
	Zambales	66.7	60.2	94.8	27,826	13.0	18.3	18.4	12.6
4A	Batangas	71.0	51.7	93.4	26,053	10.8	9.6	5.6	5.8
	Cavite	69.7	64.3	95.6	31,814	11.7	7.2	3.4	3.1
	Laguna	67.1	60.8	93.1	34,717	12.1	13.9	5.3	7.0
	Quezon	67.7	46.4	91.2	22,283	13.7	12.8	33.1	8.3
	Rizal	70.2	66.9	94.2	39,895	11.3	10.8	30.9	9.4
4B	Marinduque	64.8	33.7	92.1	16,973	15.3	8.8	10.4	11.2
	Mindoro Occidental	63.0	33.2	92.4	23,876	16.6	16.9	12.7	9.9
	Mindoro Oriental	65.0	40.7	87.1	21,268	15.4	8.5	9.1	8.0
	Palawan	64.4	44.9	87.3	25,202	18.1	22.7	31.8	10.3
	Romblon	63.8	38.7	90.2	15,679	17.0	14.1	23.2	8.5
5	Albay	67.9	46.0	91.0	18,763	14.2	17.7	16.3	4.9
	Camarines Norte	64.0	42.9	86.6	19,776	18.0	10.0	49.7	11.4
	Camarines Sur	69.9	35.5	84.5	20,798	13.1	14.0	17.3	9.3
	Catanduanes	65.8	39.6	95.3	22,591	17.1	13.0	4.3	10.0
	Masbate	64.0	23.3	84.0	12,825	17.4	24.8	63.3	14.9
	Sorsogon	67.8	37.4	92.3	15,637	15.6	20.6	24.7	11.3
6	Aklan	62.9	50.3	94.6	21,391	17.8	17.0	31.4	14.2
	Antique	62.0	38.4	94.8	24,976	18.7	21.6	10.5	18.6
	Capiz	64.5	41.3	91.1	22,408	16.9	23.6	47.3	11.8
	Guimaras	67.1	39.0	89.6	23,367	15.7	16.4	56.3	10.6
	Iloilo	68.8	51.5	92.2	30,830	13.4	16.4	35.1	12.9

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	Negros Occid.	69.0	38.0	90.2	21,774	14.1	21.7	28.2	14.0
7	Bohol	69.0	33.1	92.3	20,042	13.5	15.1	31.2	7.6
	Cebu	71.8	41.6	89.5	21,843	11.0	19.8	25.7	8.6
	Negros Orient.	65.0	33.1	79.7	23,698	15.1	26.2	35.3	7.8
	Siquijor	63.6	34.3	95.2	21,532	16.0	13.7	2.3	5.6
8	Biliran	62.8	32.6	90.4	18,902	18.1	20.6	9.9	6.1
	E. Samar	61.1	27.8	89.8	15,253	19.8	13.8	15.6	8.6
	Leyte	67.3	36.2	88.9	24,183	15.6	20.6	19.9	9.6
	N. Samar	63.3	31.8	87.2	20,509	19.2	26.4	28.1	12.7
	S. Leyte	64.6	37.6	89.6	21,519	16.4	13.7	5.8	16.8
	W. Samar	60.6	22.3	85.5	17,262	20.4	23.6	31.4	11.9
9	Z. del Norte	63.1	37.8	90.5	21,934	16.6	25.5	47.8	9.8
	Z. del Sur	66.9	37.7	85.7	20,185	15.9	22.8	33.3	12.7
10	Bukidnon	67.2	34.1	82.8	29,817	16.0	16.9	37.2	7.9
	Camiguin	63.6	46.2	94.9	20,606	16.7	14.1	6.7	4.7
	Lanao del Norte	63.7	47.7	92.4	25,572	16.6	26.6	16.5	5.6
	Mis. Occid.	65.7	41.3	90.4	21,170	16.2	15.2	17.2	6.3
	Mis. Orient.	68.4	55.2	92.1	31,795	13.0	15.5	13.6	7.3
11	Davao del Norte	65.1	36.5	88.5	22,668	16.7	14.5	45.7	9.2
	Davao del Sur	69.9	49.4	85.3	29,641	12.8	31.2	19.3	7.5
	Davao Oriental	68.3	31.8	87.4	26,298	15.6	25.4	21.0	6.1
12	North Cotobato	68.0	42.9	90.9	19,443	14.6	27.2	23.8	14.1
	Sarangani	67.2	33.6	69.3	17,722	15.1	26.4	34.4	13.0
	South Cotobato	67.2	50.2	89.8	32,101	14.5	26.4	14.4	14.5
	Sultan Kudarat	63.1	41.9	93.5	18,653	16.0	21.4	17.1	11.1
13	Agusan del Norte	63.8	46.7	87.6	21,340	16.3	11.8	16.8	8.3
	Agusan del Sur	62.4	33.2	88.0	18,462	19.3	28.2	30.0	8.8
	Surigao del Norte	65.9	35.3	91.7	19,244	15.6	18.4	8.4	12.3
	Surigao del Sur	62.7	40.2	85.8	22,028	19.3	17.6	18.6	10.0
ARMM	Basilan	60.2	28.6	82.1	13,193	18.1	51.9	53.7	-
	Lanao del Sur	56.9	35.7	76.9	15,936	22.9	40.7	70.5	7.4
	Maguindanao	52.6	36.1	76.6	19,967	24.3	31.3	52.2	10.7
	Sulu	52.3	18.1	77.7	7,850	28.6	42.3	71.0	8.9
	Tawi-Tawi	50.8	34.2	90.9	11,349	29.7	47.3	81.1	10.4

*Source: PHDR 2002

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Appendix Table 3

REGRESSION VARIABLES	DEFINITION	SOURCE
DEPENDENT VARIABLES		
HDI	Human Development Index 2000	PHDR 2002
HPI	Human Poverty Index 2000	PHDR 2002
INDEPENDENT VARIABLES		
Ecological Variables		
climate	Climate type (control : with a distinct dry (November to April) and wet (May to October) season)	NAMRIA map
Climate type 2	Dummy for province mostly or entirely under climate 2 (no dry season and a very pronounced maximum rain period from December-January)	NAMRIA map
Climate type 3	Dummy for province mostly or entirely under climate 3 (whose seasons are not very pronounced, with a short dry season and no very pronounced maximum rain period)	NAMRIA map
Climate type 4	Dummy for province mostly or entirely under climate 4 (rainfall evenly distributed throughout the year)	NAMRIA map
Mountainous	Dummy for predominantly mountainous province	NAMRIA map
Coastal	Dummy for coastal province	NAMRIA map
Infrastructure Variables		
International port	Dummy for international air/sea port	
Road density 1990	Population Density 1990	DPWH
Population density 1990	Population Density 1990	NSO
Infrastructure Variables		
Dynasty	Percent of provincial officials (governor, vice governor, congressmen) in 1998 related by blood or marriage	Interviews, Balisacan 2002
Education expenditure per capita	Per capita budget on education (average for 1993 and 2000) proxying for national governance	GAA
Communist insurgence	Dummy for presence of communist insurgence in the area	AFP
ARMM	Dummy for Autonomous Region of Muslim Mindanao	

ACRONYMS

AFP	Armed Forces of the Philippines
DPWH	Department of Public Works and Highway
GAA	General Appropriations Act
NSO	National Statistics Office
NCIP	National Commission for Indigenous People
NSCB	National Statistical Coordination Board
NAMRIA	National Mapping and Resource Information Authority
PHDR	Philippine Human Development Report