

Tabuga, Aubrey D.; Reyes, Celia M.

Working Paper

A Note on Economic Growth, Inequality, and Poverty in the Philippines

PIDS Discussion Paper Series, No. 2011-30

Provided in Cooperation with:

Philippine Institute for Development Studies (PIDS), Philippines

Suggested Citation: Tabuga, Aubrey D.; Reyes, Celia M. (2011) : A Note on Economic Growth, Inequality, and Poverty in the Philippines, PIDS Discussion Paper Series, No. 2011-30, Philippine Institute for Development Studies (PIDS), Makati City

This Version is available at:

<https://hdl.handle.net/10419/126854>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Philippine Institute for Development Studies
Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas

A Note on Economic Growth, Inequality, and Poverty in the Philippines

Celia M. Reyes and Aubrey D. Tabuga

DISCUSSION PAPER SERIES NO. 2011-30

The *PIDS Discussion Paper Series* constitutes studies that are preliminary and subject to further revisions. They are being circulated in a limited number of copies only for purposes of soliciting comments and suggestions for further refinements. The studies under the *Series* are unedited and unreviewed.

The views and opinions expressed are those of the author(s) and do not necessarily reflect those of the Institute.

Not for quotation without permission from the author(s) and the Institute.



December 2011

For comments, suggestions or further inquiries please contact:

The Research Information Staff, Philippine Institute for Development Studies

5th Floor, NEDA sa Makati Building, 106 Amorsolo Street, Legaspi Village, Makati City, Philippines

Tel Nos: (63-2) 8942584 and 8935705; Fax No: (63-2) 8939589; E-mail: publications@pids.gov.ph

Or visit our website at <http://www.pids.gov.ph>

A note on economic growth, inequality, and poverty in the Philippines

Celia M. Reyes and Aubrey D. Tabuga¹
October 2011

Abstract

We examined the relationship among poverty, economic growth, and inequality by decomposing poverty changes at sub-national levels. The results were examined against the performances of the different economic sectors in the regions to understand the relationships while accounting for the nature of growth. Moreover, the poverty elasticity of output growth was estimated using regional-level data in 2003, 2006 and 2009. We learned that while the rate of growth matters a lot in poverty reduction, the redistribution of income matters as well. More importantly, we find that, at a given rate of growth, the response of poverty rate to growth is higher when income distribution is less unequal.

Keywords: poverty, decomposition, inequality, GLS regression, random-effects, Gini decomposition

¹ Senior Research Fellow and Research Associate at PIDS, respectively

Economic growth, inequality, and poverty in the Philippines

Celia M. Reyes and Aubrey D. Tabuga

1. Introduction

It is clear that the Philippines has seen its most sustainably high economic growth rate in recent years. The GDP grew no less than 4 percent in 7 consecutive years, from 2002 to 2008. The experience we have had that can come closer to this was during the Ramos administration in 1994 to 1997 where we sustained a growth rate of 4 percent and above for 4 consecutive years. There was no other instance that we can name of that can surpass the economic progress we have had recently.² And yet poverty rate for the first time went up continuously from 24.9 in 2003 to 26.4 in 2006, and slightly to 26.5 in 2009. At this rate, the country will not meet its poverty targets in the Millennium Development Goals (MDGs). The rising poverty amidst high economic growth is an intriguing situation. Even when the economy performed sluggishly, poverty rate was on a decreasing trend. What factors then accounted for the rise in poverty amidst faster economic growth?

Notable literature on the poverty and growth nexus for the Philippines point out that growth alone is not sufficient to lift the poor out of poverty. It was noted that the country's "growth elasticity" of poverty reduction is not only way below international standards but also below the average for developing countries.³ Thus even with a very high income growth, poverty reduction wouldn't normally respond significantly because of this nature of relationship between growth and poverty in the country. Recently, this poverty-growth nexus haunts us once more as we don't see poverty rate decline but rather inch up even at times when we thought that we are doing relatively better economically.

With this in mind, we look into the National Income Accounts (NIA) data particularly the share of institutions. We noted the seemingly inconsistency between the trend in the income generated by the NIA and that of the household survey Family Income and Expenditure Survey (FIES) which this analysis exhaustively utilized. Since the GDP per capita data takes into account the aggregate output of all institutions, it is expected that its movement does not have a 1 to 1 correspondence with that of the income of households.

Moreover, the lack of concrete redistributive policies or safety nets for the poor negates the poverty-reducing effects of economic growth. The effects of recent global economic crisis which manifested in 2009, the price shock in 2008, and the string of natural disasters that have struck the country have been felt. All these factors have come to interplay with the nature of the economic growth that the country experienced.

This paper decomposes the changes in poverty with respect to economic growth and changes in income distribution, both at the national and regional levels. The geographic diversity of the country calls for a more nuanced assessment rather than aggregate to arrive at more

² Since 1985 when the country started to release its official poverty estimates

³ Balisacan (2007)

meaningful information for policy formulation. Poverty elasticity of growth was also estimated. We note that the nature of economic growth we have experienced recently is of the nature that does not benefit the poor, that the growth rates were highly variable across space, having very low growth where it was needed the most, and that worsening inequality took away whatever gains we could have enjoyed from a booming economy. Also, inequality plays an important role on growth's effectiveness in reducing poverty.

2. Decomposing poverty changes

The routine proposed by Datt and Ravallion decomposes the poverty changes into growth and redistribution effects.⁴ In this paper we analyze two episodes – 1) 2003 to 2006; and 2) 2006 to 2009, for these are the periods where official poverty statistics have been released. Also, because the substantial increase in poverty happened between 2003 and 2006, where the GDP was also growing more rapidly, the analysis may highlight this episode.

The consistently high GDP growth prior to the 2009 global economic crisis is shown in the Figure 1. The trend shows the usual boom-bust cycle that the Philippine economy experiences and the longer boom period from 2002 to 2008 is evident. This is the period which we are analyzing because it is when the poverty incidence also went up continuously.

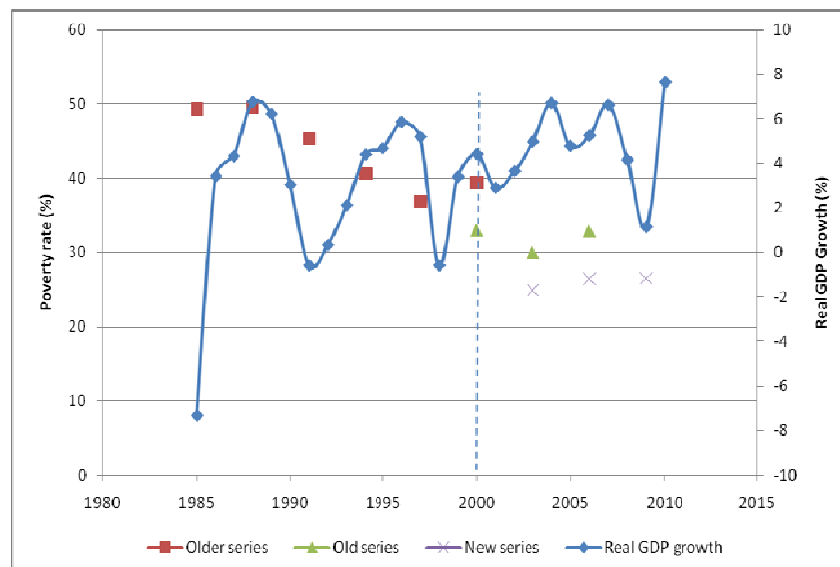


Figure1. Real GDP growth rate versus poverty rate, 1985 to 2009, Philippines

Source of basic data: NSCB and NSO

Note: Real GDP data for 2000 onwards are not comparable with the rest

The poverty changes, in percent points, have been decomposed into growth and redistribution effects. This method tells us where the recent poverty rate increases were

⁴ The command line “gidecomposition” in Stata was used

attributable – either from a decline in per capital real income or changes in the income distribution or both. Table 1 shows the results of the decomposition analysis.⁵ The third and fourth columns show the absolute changes in the poverty rate attributable to growth and redistribution components, respectively. For the period 2003 to 2006, the increase of 1.464 percentage points in the headcount poverty was the result of a) 1.077 points effect of growth, b) 0.384 redistribution effect, and c) 0.002 interaction component. The interaction component refers to the effect that cannot be accredited exclusively to growth or redistribution. Both the growth and redistribution components are positive, therefore poverty-increasing. The magnitudes of the estimates differ but the directions are consistent with that of Reyes et. al. (2010), the difference is that this made use of the newly-released improved poverty lines from the NSCB.⁶

Growth takes a positive estimate, a poverty worsening effect, which implies that on the average, real income fell with respect to the poverty line. Its magnitude is also bigger and therefore the dominating cause of poverty rise. If we are to interpret the number, had income distribution remained at the 2003 level, poverty rate would have gone up from 24.9 in 2003 to 26.02 percent in 2006 instead of 26.4. At the same time, changes in income distribution aggravated the situation because it drew more people into poverty as shown by its positive, though modest, coefficient. Had there been no change in real income of households during this period, poverty rate would have gone up to 25.3 percent in 2006.

Meanwhile, the slight yet continuous ascend of poverty incidence in 2009 was a relatively better situation because the redistribution component was a negative 1.118. The growth component was still positive and about the same magnitude as in the previous period signifying the same nature of growth that transpired. The net effect was largely affected as well by the interaction component which in this case has a magnitude (0.133) that is bigger than the change in poverty (0.079). Therefore, the analysis does not dwell on the results of this estimation because the change in too small for drawing plausible relationships.

Table 1. Decomposition of poverty headcount changes into growth and redistribution, 2003 to 2009 a/				
Period	Change in Poverty Incidence	Growth Component	Redistribution Component	Interaction Component
2003-2006	1.464	1.077	0.384	0.002
2006-2009	0.079	1.065	-1.118	0.133
2003-2009	1.543	2.06	-0.717	0.2

a/ Authors' estimates; real income data are based in 2003 prices, based on the improved poverty thresholds; source of basic data: Family Income and Expenditure Survey (FIES), NSO; poverty thresholds and 2003 weights from NSCB; weights for 2006 and 2009 from NSO

⁵ The methodology used was that by Ravallion and Huppi (1991) using the “gidecomposition” command in Stata. For a note on the methodology, see Technical Notes in the Appendices.

⁶ It also uses only one set of poverty lines, that is the 2003 ones, and per capita income were based on 2003 prices using the price changes reflected in the provincial thresholds.

The changes in other poverty measures like the poverty gap and severity were also analyzed (Table 2). In period 2003 to 2006, the poverty gap and severity both worsened brought about by a greater effect of growth rather than redistribution. In fact, even in 2006 to 2009, growth was considered to be poverty-worsening having both positive coefficients (for gap and severity analyses).

Meanwhile, changes in income distribution were instrumental in reducing poverty gap and severity as shown by its negative components in both estimation routines. The effect was large particularly during the 2006 to 2009 and this has led to reduction in both poverty gap and severity in the country during this time.

Table 2. Decomposition of poverty changes into growth and redistribution, poverty gap and severity, 2003 to 2009 a/				
Period	Change in poverty measure	Growth component	Redistribution component	Interaction component
Poverty gap				
2003-2006	0.272	0.426	-0.167	0.013
2006-2009	-0.357	0.416	-0.768	-0.006
Poverty severity				
2003-2006	0.024	0.208	-0.185	0.001
2006-2009	-0.224	0.201	-0.41	-0.015

a/ Authors' estimates; real income data are based in 2003 prices, based on the improved poverty thresholds; source of basic data: Family Income and Expenditure Survey (FIES), NSO; poverty thresholds and 2003 weights from NSCB; weights for 2006 and 2009 from NSO

In this paper, the results of the 2003 to 2006 decomposition of poverty headcount changes are consistent with that in Reyes, et.al. (2010) but the magnitudes (of changes and components) differ because the poverty rates are different (owing to the improvement in poverty estimation methodology). Both results show that in 2003 to 2006 the poverty change was primarily attributed to growth aspects, aggravated by effects in distribution changes.

3. Lack of growth in poor regions

Although the country has just demonstrated its best economic growth so far, the growth has not exactly been consistent throughout the regions. The Philippines is a highly diverse archipelago, whatever happens to the overall poverty situation is just the net effect of what happened in the regions.

Before looking into the growth-poverty relationship, it is essential to understand where growth did or did not take place. What happened is that the recent economic expansion failed to go under the surface especially in the country's poorest regions –ARMM and MIMAROPA. Thus, significant growth just did not happen where it is badly needed. In fact, ARMM has the lowest mean per capita GRDP among all regions in all three years. However, it suffered a very slow growth during 2003 to 2009, at an average annual per capita GDP growth rate of only 1.37 percent. ARMM's growth, when compared to those of its neighbours in Mindanao, is the lowest, yet it has the most significant rise in poverty rate with 14.5 points (Figure 2).

Aside from ARMM, the 2 regions with the lowest growth rates are CALABARZON and Central Luzon. CALABARZON has relatively lower poverty rate but it has the largest population among all the regions, which therefore has one of the highest numbers of poor people. Central Luzon, another highly-populated region, also experienced economic deceleration, although the poverty increase had more to do with the nature rather than rate of economic growth. Meanwhile, MIMAROPA, during 2003 to 2006, also experienced a very low annual growth rate of 1.31. MIMAROPA has one of the highest poverty headcount rates.

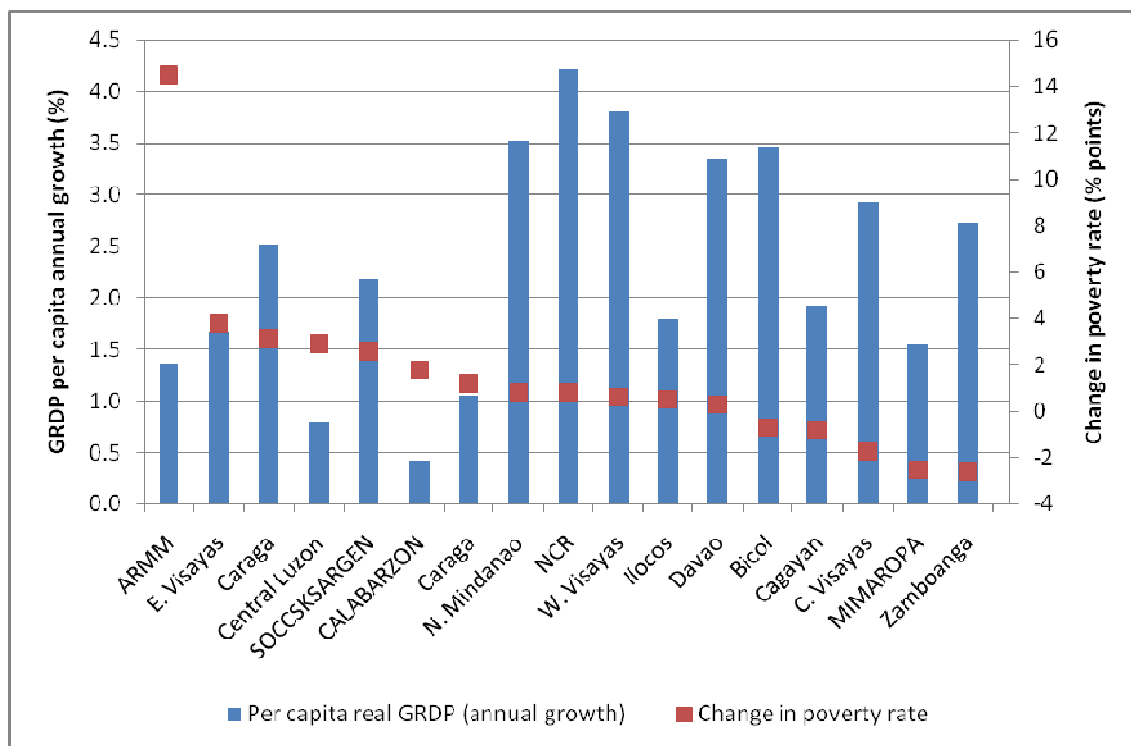


Figure 2. Comparative GRDP per capita annual growth rates (%) and difference in poverty rates (% points) by region, 2003 to 2009

All the four regions mentioned had a mean per capita GDP growth that ranged from 0.93 to 1.9 from 2003 to 2006, which is the period where aggregate poverty had a bigger leap. These growth rates are way below the national average of 3.4 percent. The total increase in the number of poor in these regions accounts for 43% of the country total during that period. Among these four regions, only MIMAROPA recovered and was able to reduce its poverty rate in 2009. The growth rates of the rest -ARMM, CALABARZON, and Central Luzon, further deteriorated and this has caused the poverty incidences to go up even higher.

4. The nature of growth matters

While economic growth in general is important, what matters as well for poverty reduction is the nature of the growth that transpired. We claim that growth in recent times was not broad-based and therefore not as beneficial to poverty reduction efforts as we had hoped. Aside from being differential across regions, the economic growth we have experienced has likewise not been equitable across sectors. The agricultural sector has considerably been outpaced by the industry and services sectors. And knowing that poverty in the Philippines is still largely agricultural, the result was a reversal in the poverty trend.

The period at which poverty consistently rose was the same period when the agriculture sector decelerated. About three-quarters (71%) of the poor still live in the rural areas and because agriculture is the main source of income for the rural dwellers, lack of growth in this sector affects the rural poor's ability to augment their income. In Figure 3, it is evident how agriculture has decelerated significantly through the years. From an average annual growth rate of agriculture's GVA of 3.7% in 2000 to 2003, the sector has decelerated to 3.3% and 2.4% during 2003-2006 and 2006-2009 respectively. Meanwhile, the industry and services sectors both experienced notable increases in their growth rates especially during 2003 to 2006. And although the momentum was not sustained in 2006 to 2009, the performance of these sectors was still above that of the agriculture.

Agriculture has been left out in the recent economic progresses that have been achieved, thus affecting the poor because poverty is still very much agricultural. Poverty incidence among agricultural households is thrice that for non-agricultural households (Table 3). This has been the case in many years. One out of two agricultural households is income poor.

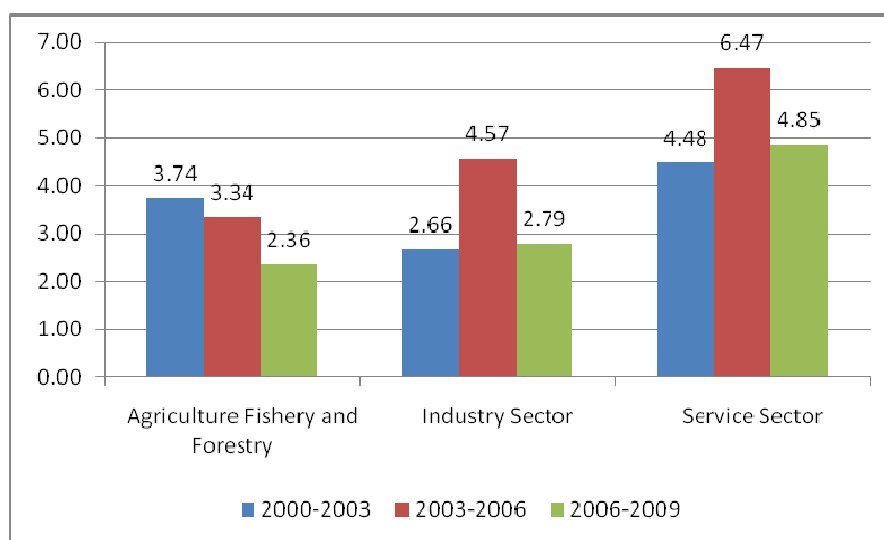


Figure 3. Average annual growth rate of GVA by sector, 2003 to 2009

Type of households	Poverty incidence, %			Share to total poor		
	2003	2006	2009	2003	2006	2009
Agricultural households	54.7	57.1	56.8	57.9	54.6	50.8
Non-agricultural households	14.2	16.0	17.1	42.1	45.4	49.2

To illustrate this more clearly, nearly 5 in every 10 households which experienced decline in real income between 2003, the period at which poverty fell significantly, were engaged in agricultural activities (crop farming, fishing, animal husbandry) in 2003 (Figure 7). The other households which have experienced lower income levels were those engaged in trade (13%), transport (11%), and construction (8%). Majority of households that were previously nonpoor which became poor in 2006 were engaged in agriculture (Figure 8). This reinforces the argument that the poor performance of the agriculture sector was a key factor behind the rise in poverty during this period.

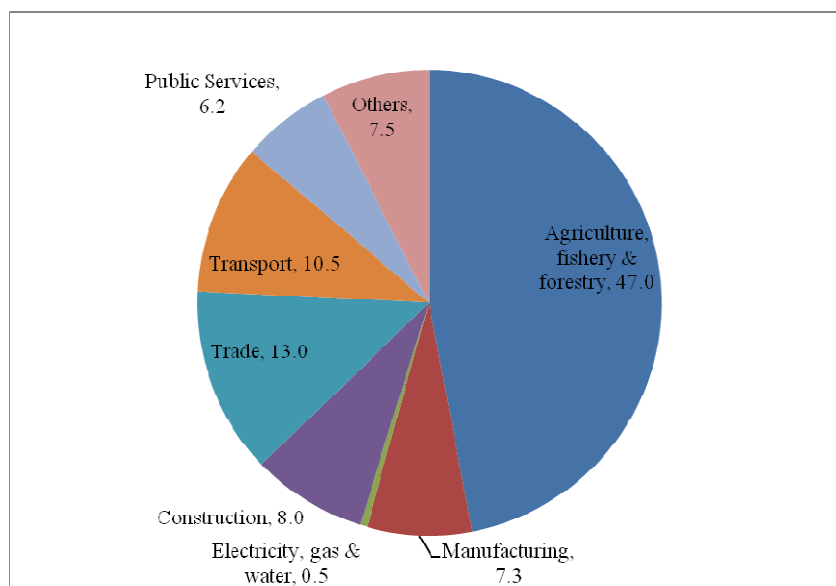


Figure 7. Distribution of households who experienced declining real income in 2006 by sector of employment of the head in 2003, Philippines (%) Note: Authors' estimates

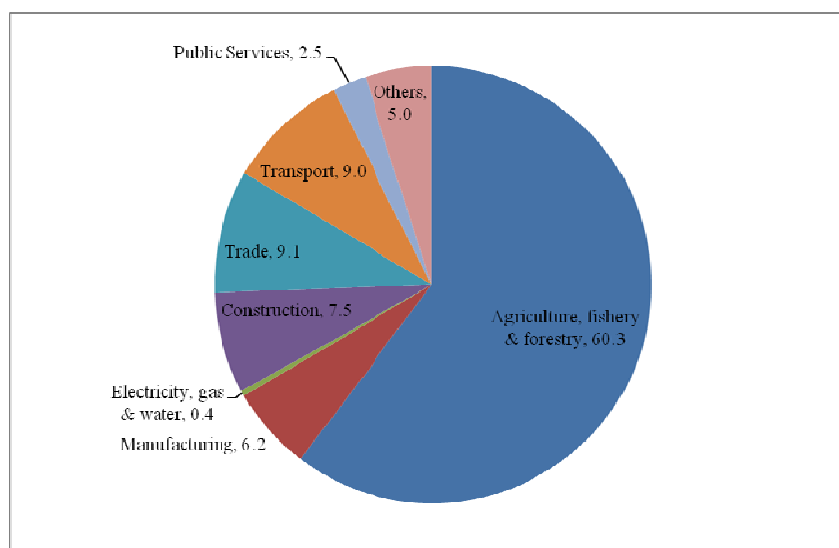


Figure 8. Distribution of previously non-poor households who became poor in 2006 by sector of employment of the head in 2003, Philippines (%), Note: Authors' estimates

Indeed, the rate of growth isn't everything. It is also the nature of the growth that matters. To further illustrate this, the experiences of the different regions have been examined. The regional poverty changes have been decomposed into growth and redistribution effects and were cross-examined in relation to the performances of the different sectors in the regional economy. We looked at the situations of several regions particularly those which have had better economic performances through higher GRDP growth and how they fared in terms of poverty measures and those regions which experienced notable changes in poverty rates so we see the nature of growth that they experienced.

Before we conclude anything, it should be clear that the GRDP data comes from the Regional Income Accounts while the poverty measures were computed from the Family Income and Expenditure Survey (FIES). The Regional Accounts account the output of all institutions including households while the FIES covers only income of the households. An increase in the GRDP may not necessarily be in the same proportion as the income reported in the FIES, the latter is just a subset of the former, and their changes may not go in the same direction. The issue involving the seemingly inconsistency in the trends between these two sets of data is discussed in more details in a separate section.

Looking at the experiences of several high-performing regions, there were cases where the component in the decomposition analysis was shown to be poverty-worsening and this was associated with the agriculture sector being left out. Such was the experience of Central and Western Visayas, and Bicol Region.

During 2003 to 2006, Central Visayas's GRDP grew considerably, at 3.8 percent annually. However, despite this, the decomposition analysis shows that there was a lack of growth (to reduce poverty rate). The growth component was a positive 0.961 point –causing the poverty rate to go up rather than down. During this time, the agriculture sector decelerated and eventually shrank in 2006 (Figure 9), while the rest of the sectors have been performing well, growing at least 4 percent annually. The region's most important sectors in terms of output are trade (34%) and manufacturing (18%). However, about 46% of the poor in the region in 2003 are considered agricultural households. It is likely that the poor have been affected significantly when the agricultural sector slowed down and shrank during this period.

Meanwhile, Western Visayas' economy has also been impressively and consistently growing fast during 2003 to 2009 with an average annual per capita GRDP growth rate of 3.8 percent. Yet, in 2009, its poverty headcount worsened from 28.6 to 31.2 percent. In the decomposition analysis, the growth component (or the component brought by the change in real income) turned in a positive, hence, poverty-increasing outcome (which is 2.466 points). During this time, there was a sharp decline in the growth rate of GVA in trade, one of the regions' key sectors (contributing 22 percent to total regional output). Moreover, the agriculture sector has been performing way below the rest of the other sectors. In 2006, 60% of the poor were agricultural households. Growth was also not that instrumental from 2003 to 2006 in reducing poverty because the decomposition results show that poverty rate declined primarily due to an improvement in the income distribution. The lacklustre performance of the agriculture sector relative to the other key sectors was even more evident in 2003 to 2006 (Figure 10).

Among the regions, Bicol has been a better performer in terms of poverty reduction. In 2006, the headcount poverty of Bicol went down from 45.8 to 45.2. In 2009, the trend continued but very modestly, poverty rate went down very slightly from 45.2 to 45.1. During this time, the region was really doing well above all the other regions at an average annual per capita GDP growth of 4.5 percent and equitably too because its Gini index dropped to 0.4491 from 0.4786 in

2006 (Appendix Table 2). Surprisingly, in the decomposition analysis, the growth component was a positive 1.079, hence, poverty-worsening. This got in the way of the region to experience a significant decline in poverty. Why?

In Figure 11, the mean annual GVA growth of each sector per period shows that in 2006 to 2009, the agriculture sector was lagging behind all sectors except for electricity, gas, and water. It was growing only at an average of 2.7 percent annually while the rest were booming particularly mining and quarrying (22.6%), construction (21.4%), finance (9.4%), and private services (7.4%). Even trade and manufacturing which are supposed to be more vulnerable to the recent global economic crisis were doing better than agriculture at annual growth rates of 3.6 and 3.2 percent, respectively.

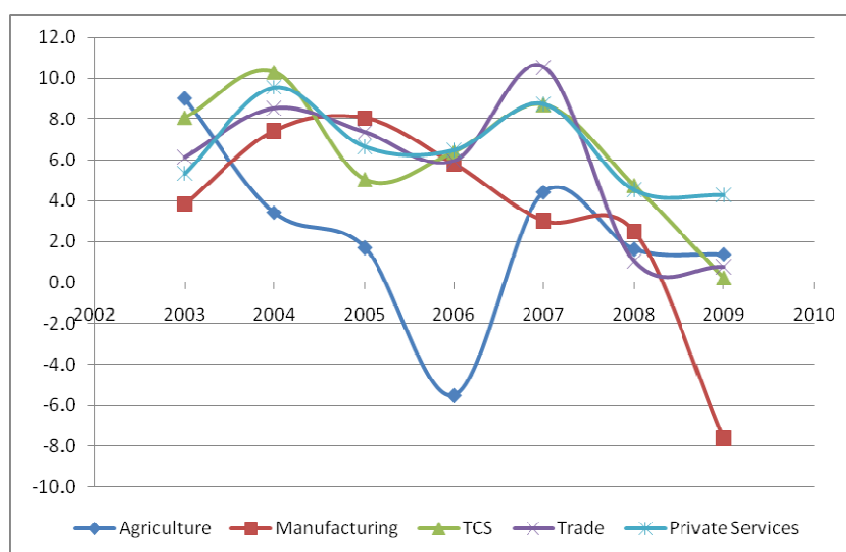


Figure 9. Growth rate of Region VII's major industries, 2003 to 2009
Source of basic data: NCSB Regional Gross Domestic Product

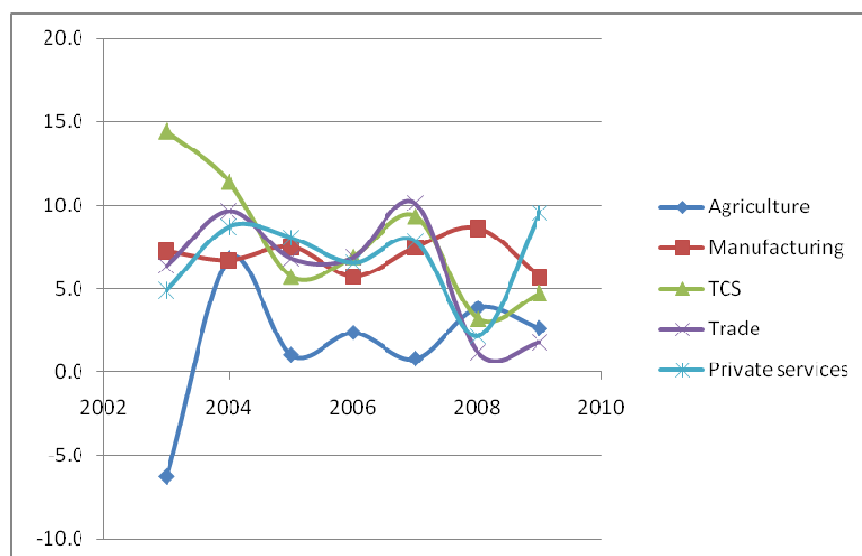


Figure 10. Growth rate of Region VI's major industries, 2003 to 2009
Source of basic data: NCSB Regional Gross Domestic Product

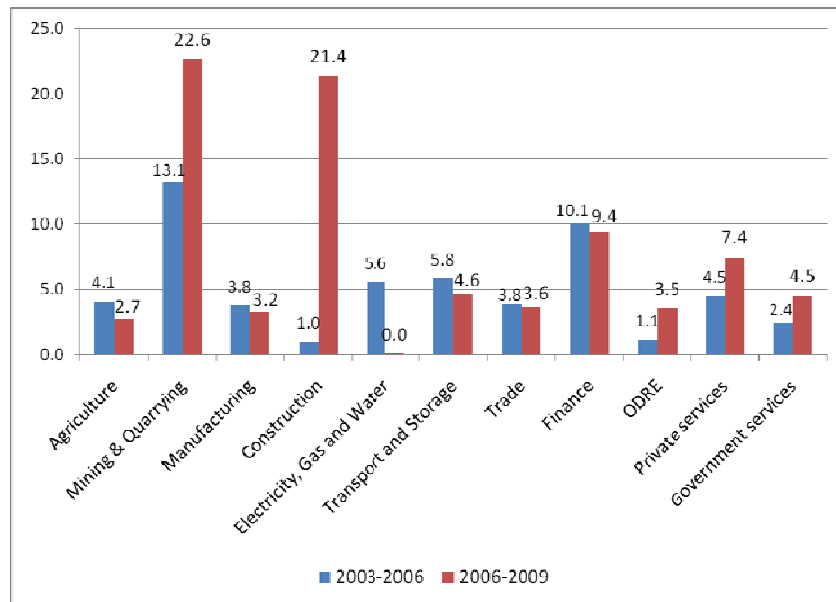


Figure 11. Average annual growth rate of GVA by sector, Bicol Region

In the case of Western Visayas, as discussed previously, the poverty rate rise in 2009 was due primarily to lack of growth. The agriculture sector has been the slowest growing sector (at an average of 2.4 percent) compared to other key sectors of the region during this period (manufacturing: 6.9%; TCS: 6.1%; trade: 5%; and private services: 6.5%).

We have learned from the above discussion that poverty persisted in several regions despite the high economic growth rate, and that this was associated with the poor performance of the agriculture sector. However, we do not necessarily observe the other side of the coin, that is – poverty reduction as a result of better performing agriculture sector. This is quite understandable because of the rarity of occasion where one can see a lively performance of this sector.

There was an instance where the growth component in the decomposition analysis was negative, hence poverty-reducing. This was the case of Central Luzon from 2003 to 2006. Central Luzon's experience was different because just when the overall growth was very low, at only 0.9 percent annually, it was shown to have facilitated poverty reduction. During this time, agriculture and manufacturing, two of the region's bread and butter experienced a dip (in 2004) but later recovered in 2005 and 2006 (Figure 15). It is important to note however that during the times when these sectors have been going uphill, the rest of the other vital sectors, trade and transport and storage, have been performing relatively well also.

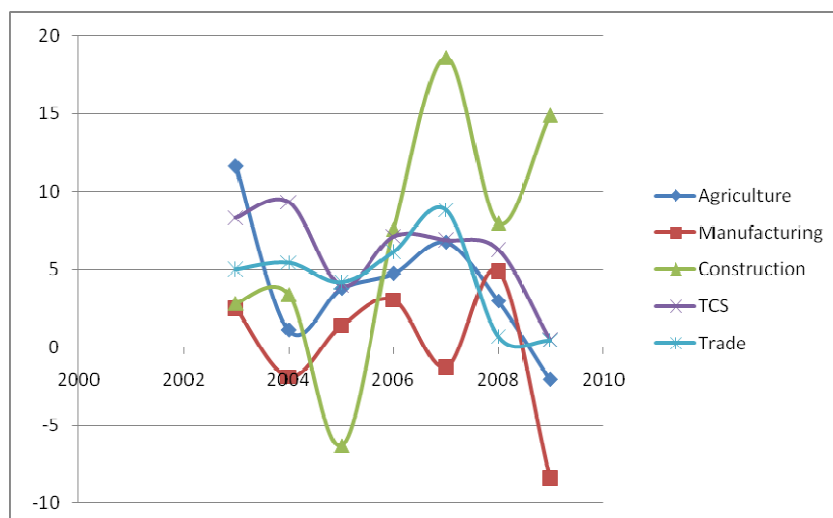


Figure 15. Growth of GVA in Central Luzon's key sectors

These evidences indicate the great need to balance growth among various sectors. In poverty reduction initiatives, investing in the agriculture sector where one would most likely find a large portion of the poor is an important aspect that should not be taken for granted. It should be an accepted fact that the poor cannot simply break away from agriculture. Provision of effective safety nets for them is essential to weather the effects of various economic shocks and prevent more people from falling into poverty.

Inequality effects

Apart from the rate and nature of growth, the way resources are redistributed matters equally. Whatever gains we have achieved from economic growth, if the distribution of resources changes to the disadvantage of the poor, poverty can still persist and even worsen. Moreover, there were instances where poverty rate still managed to pull down poverty despite the lack of growth because of improved income distribution. We can see this from the various experiences of the regions.

We have learned that overall poverty rose partly because there were no significant economic progresses in regions where the poor are. So where economic growth did actually took place? The regions which did performed quite well were NCR, Regions 6, 7 and 10. Their per capita GDP growth rates ranged from 3.8 to about 6 percent during 2003 to 2006 (the period at which aggregate poverty rose significantly). However, the growth effects in these regions were overshadowed by income inequality. The real income of people changed in ways that left the poor even poorer relatively.

In the decomposition results per region, the negative (poverty-reducing) effect of growth was negated by the positive component of redistribution. These were the cases of CAR, Central

Luzon and Eastern Visayas. All of them have experienced poverty-reducing kind of economic growth in 2006 but all eventually saw their poverty rate rising because of worsening inequality. The gains in poverty reduction attributed to growth did not materialize because of the absence of an effective intervention to keep the income distribution at least the same as before.

There were several instances where improvement in the income distribution contributed to the reduction of headcount poverty. The cases when the redistribution component was larger than the growth component and has negative effect, hence poverty-reducing, were those of NCR, CAR, and Bicol in 2009, and Western Visayas in 2006. Meanwhile, redistribution has also augmented the reducing effects of growth in the rare cases of MIMAROPA, and Central Visayas in 2009, and Zamboanga Peninsula in 2006.

In many instances, the growth component of the poverty changes which was positive (poverty-increasing) dominated the poverty-reducing effect of redistribution. Such were the experience of Central Luzon, CALABARZON, Zamboanga Peninsula, and ARMM in 2009; and Cagayan Valley, MIMAROPA, Davao Region, SOCKSARGEN, and ARMM in 2006. In the face of an economic downturn when there is lack of income growth, income distribution changes had further aggravated the situation as exhibited by NCR, Ilocos, and MIMAROPA in 2006, and Central Visayas and MIMAROPA in 2009. There were also times when even with a poverty-reducing income growth effect, the income distribution worsened and this has caused poverty to even inch up.

Even at the presence of fast economic expansion and even when the nature of growth was poverty-reducing, if there are no concrete policies to achieve equity, these become useless in terms of poverty reduction efforts. Central Luzon for instance had a growth, albeit low, in 2003 to 2006 that is poverty-reducing, as shown in the decomposition result, but still suffered from poverty increase because of worsening income inequality.

5. Factors that contribute to inequality

The state of equity, as shown above, matters a lot in poverty reduction. Policy-wise, there are a number of direct and indirect interventions that help policy implementers on how to tackle the issue that is inequality. Essential information that may be of help in terms of its policy implications is the sources of inequality. We decomposed the Gini coefficient to come up with the share of income sources and subpopulations to inequality.

It used the routines in decomposition of inequality via Stata proposed by Lopez-Feldman (2006). This is the “descogini” command which allows decomposing the Gini coefficient by income source or subpopulation and estimating the marginal effect that a source/sector has on inequality using the approach presented by Lerman and Yitzhaki (1985). The standard errors and

confidence intervals can also be estimated by using bootstrap.⁷ To quote Lopez-Feldman (2006), the Gini coefficient of say, total income can be represented as:

$$G = \sum_{k=1}^K S_k G_k R_k$$

Where S_k represents the share of source k in total income, G_k is the source Gini that corresponds to the income distribution from source k , and R_k refers to the Gini correlation of income from source k with the distribution of total income.

The Gini decomposition of total income is shown in Table 4. Various income sources have varying effects to inequality. For instance, wage income particularly that from non-agricultural activities has a positive contribution to income inequality, that is, a 1% increase in this income source increases the total income inequality by 0.082%, all else being equal. Remittances from abroad also have unequalizing effect. A one percent rise in international remittance income increases inequality by 0.05 percent. It is also the most unequally distributed income source among all types of income with a Gini coefficient of 0.9048. It doesn't always follow though that if the source has a lower Gini index, take non-agricultural wages for instance, it has equalizing effects.

One income source that has an equalizing effect to total income is agricultural wages. A 1 percent increase in wages from agricultural activities decreases the overall inequality by 0.0475, holding other factors constant. Domestic remittances also tend to equalize total income. An income source that has a high equalizing marginal effect is entrepreneurial income from agricultural activities. A 1 percent increase in income from these activities lowers the total Gini by 0.0809 percent, all else held equal.

These results have important implications in boosting poverty reduction efforts. In the decomposition of poverty changes discussed in earlier section, it was shown that income distribution changes matter a lot. Interventions that may have more equalizing effects are those that tend to improve the entrepreneurial productivity of the population particularly in the agricultural sector. Also, this proves again that sound agricultural policies and related efforts are critical in any poverty reduction effort.

Table 4. Decomposition of total income Gini by income source					
Source	Share to total income (Sk)	Income source Gini (Gk)	Correlation bet. income source Gini with total income Gini (Rk)	Share to Gini of total income	% Change
Wages, agricultural activities	0.0334	0.8806	-0.2209	-0.014	-0.0475

⁷ Stata Journal (2006)

Wages, non-agricultural activities	0.3884	0.7181	0.783	0.4706	0.0822
Remittances, domestic	0.0357	0.8075	0.1734	0.0108	-0.0249
Remittances, foreign	0.1115	0.9048	0.7438	0.1617	0.0502
Entrepreneurial activities, agriculture	0.0928	0.8013	0.0743	0.0119	-0.0809
Entrepreneurial activities, non-agriculture	0.1466	0.8506	0.6264	0.1683	0.0217
Other income, N.E.C.	0.1915	0.5954	0.7763	0.1908	-0.0008
Total income		0.4641			

*The bootstrapped standard errors and confidence intervals were also computed and were shown in the Appendices.

6. Poverty elasticity of growth

We have seen in previous chapters how important growth, both the rate and nature, and better income distribution are to poverty reduction. We have decomposed the poverty rate changes into growth and redistribution, and this has provided important insights. To complement such analysis, we estimated an empirical model to obtain the poverty elasticity of growth. Heltberg (2002) emphasized that the dichotomy of growth versus redistribution, such as that one done previously, is false because the “growth effect is itself a function of the degree of inequality.” To implement the idea of inequality being an important factor that explains elasticity of growth, we estimated the poverty elasticity of growth at varying levels of inequality. We implement this also by including the interaction of growth and redistribution. Our simple empirical model was estimated using a panel data of sub-national units (i.e. regions) covering 2003, 2006, and 2009. The model estimated is as follows:

$$\text{Change in poverty} = f(\text{growth, redistribution, X}),$$

where change in poverty is a function of growth, the change in income distribution, and a vector of other factors, X, like time-invariant characteristics of the regions that have great impacts to poverty changes. Growth was expressed as either total Gross Regional Domestic Product or in per capita terms. The share of the population’s bottom 40 percent was included to account for the effects of income distribution in poverty. In another case, the initial level of inequality was used and this was based on the idea proposed by Heltberg (2002).

One of the other factors included in the model is a dummy for the Luzon regions owing to the fact that Luzon does not experience the same geographical and physical constraints that Visayas and Mindanao regions experience. Note however that the Luzon dummy excluded Bicol Region and MIMAROPA as these regions may resemble the geographical limitations the Mindanao and Visayas regions have. Several infrastructure variables may be added to the basic model. Such basic equation was also used in Islam (2004) except that share of bottom 40 percent was used in here rather than Gini. The model was analyzed using Random-effects GLS

regression. This was necessary to include time-invariant factors into the estimation. The summary statistics for all the variables used are shown in Appendix Table 7.

The model was estimated using the log forms of the variables. The results, shown in Table 5 indicate that poverty is inelastic with respect to economic growth based on the data from 2003 to 2009, with an estimate of only -0.2 to -0.4. These estimates are far lower than that by Balisacan and Fuwa (2004).⁸ Although changes in the share of bottom 40 percent of the population show insignificant results, that of the initial level came out very significant and with a coefficient that is much higher than growth, at around -1.1. As the income share of the lower income groups increases by 1 percent, poverty rate declines by about 1.1 percent, *ceteris paribus*, suggesting the importance of equalizing interventions in poverty reduction initiatives. The Luzon dummy is consistently statistically significant. Others like infrastructural variables such as electrification, roads, and financial institutions were dropped from the model because these are highly correlated with regional output.

Table 5. Results of Random-effects GLS regression, regional-level estimations, 2003 to 2009 (all regions)				
Dependent variable: Log of poverty rate	Model 1	Model 2	Model 3	Model 4
Log of GRDP	-0.2195 **	-0.2311 **		
Log of per capita GRDP			-0.3064 *	-0.3630 **
Luzon dummy	-0.8425 ***	-0.7352 ***	-0.8741 ***	-0.7113 ***
Log of bottom 40 share	-0.0874		-0.2159	
Log of bottom 40 share for 2003		-0.7706		-1.1380 *
Constant	7.3261 ***	6.3351 ***	6.0862 ***	4.9888 ***
Prob > Chi2	0.0000	0.0000	0.0000	0.0000
R-sq, overall	0.8071	0.8353	0.7578	0.8113

N=51

legend: * p<.05; ** p<.01; *** p<.001

As mentioned earlier, it is important to highlight the effect of inequality in determining the poverty elasticity of growth. Ravallion (1997) as cited in Heltberg (2002) noted that the degree of inequality strongly affects the poverty elasticity. Ravallion (1997) estimated a regression analysis involving countries by incorporating interactions of growth and Gini, and the squared transformations. In this paper, we employ the same idea of taking into account the distribution by simply working on the subsamples of regions whose income were more equally distributed to be compared with those whose income were less equal. We also employ interaction terms to the model.

⁸ Note that they used older data and analysis was at the provincial level.

The results indicate the same as that in Heltberg (2002) that with more equal income distribution, growth becomes more effective in reducing poverty. The coefficient of the log of per capita GRDP under more equal distribution is -0.5 while under more unequal distribution, it was -0.08 (however, insignificant) (Table 6a). The interaction term between growth and redistribution turned out significant as well (Table 6b).

Table 6a. Effect of inequality on poverty elasticity (Modified version of Model 4)				
Dependent variable: log of poverty rate	All (Model 4)	More equal distribution (Model 4a)	Less equal distribution (Model 4b)	
Log of per capita GRDP	-0.3630 **	-0.5160 ***	-0.0799	
Luzon dummy	-0.7113 ***	-0.7218 ***	-0.7134 ***	
Log of bottom 40 share for 2003	-1.1380 *	-1.4014	-0.4357	
Constant	4.9888 ***	5.9572 ***	3.6051 **	
N	51	39	39	
R2-overall	0.8113	0.8799	0.8136	

legend: * p<.05; ** p<.01; *** p<.001; Note: in more equal, 4 regions (Regions 9, 7, 14, and 10) whose shares of bottom 40% were the lowest were excluded from the sample; in less equal, 4 regions which have the highest shares (Regions 1,3,13, and 15) were dropped

Table 6b. Effect of inequality on poverty elasticity of growth (with interaction)		
Variable	Model 4c	Model 4d
Log of per capita GRDP	-0.5256 **	
Luzon dummy	-0.7200 ***	-0.7790 ***
Interaction term (log per capita GRDP and initial equality - share of bottom 40 percent)	-0.1224 *	-0.0590
Log of GRDP		-0.2582 **
Constant	6.5013 ***	7.2043 ***
chi2	49.9723	57.2013
N	51	51
R2-overall	0.8055	0.8165

legend: * p<.05; ** p<.01; *** p<.001

These results provide very useful insights in treating the effects of growth and redistribution. We note that the elasticity of growth is not constant across levels of inequality. For regions like Zamboanga Peninsula, Davao Region, CAR, and Central Visayas, a faster rate of economic growth is necessary to reduce poverty by the same amount that those regions with relatively more equal income distribution can achieve with their economic growth.

The absolute values of the elasticity even under more equal circumstances is significantly low, if one compares them with those in Balisacan and Fuwa (2004) where the elasticity was

around -1.5; and Ravallion (1997) where developing countries have an average elasticity of -2.2. This is quite expected because in contrast to both studies, this paper used regional output rather than mean per capita income (for which the poverty rates are based) or mean per capita expenditures if the poverty measure was expenditure-based. The objective is to assess the elasticity of poverty with respect to overall economic growth in the region and not just the growth of household income. When mean per capita income is used in the same regional level model, the estimated elasticity was -1.4 to -1.8 for all regions and -1.6 up to -2.0 for the regions with less inequality (Appendix Table 8).

These exercises show how important redistribution is to poverty reduction. With a highly equal income distribution, economic growth translates into poverty reduction in a very effective manner while those with unequal income distribution have to grow a lot faster to achieve a comparable rate of reduction (Heltberg, 2002 citing Vietnam with its equally distributed income as compared to South Africa's unequal income distribution).

7. Declining share of households in the national output

Aside from attributing the poverty changes to lack of growth, its nature, and income distribution, we need to revisit how resources in general have been circulated throughout the entire macroeconomic landscape. Looking at National Accounts data, it was observed that the share of households in the national output has been declining. The hypothesis is that the benefits of the recent economic progress that the country has achieved have not been proportionately poured in households.

In 2004, there was shift in the shares of institutions in the GDP. Prior to 2004, the households had the highest share, followed by private corporations, then followed by the government. But the share of private corporations in the GDP has significantly increased to 50.8% in 2004 from 40.5% in 2003. On the contrary, that of the households and unincorporated enterprises went down from 46.6% to 38.6%. From 2004 onwards, the factor shares stabilized with private corporations having the highest share among the institutions (see Figures 19 and 20). Figure 19 clearly shows the contrast between the shares of households and private corporations. The private corporations' part in the GDP in 2000 was only 26.8 percent while that of the households was 57.3 percent. The critical shift happened in 2004. In 2009, private corporations take 50.8 percent of the total output while that of the households has stabilized at 40 percent.

Table 7. Comparison of per capita GDP and per capita income of households trends, 2003 to 2009

Region	NIA (All institutions)					FIES (Households only)				
	Per capita real GDP (in '000 pesos)			Per capita real GDP, annual growth (%)		Mean per capita real income (in 2003 pesos)			Mean per capita real income, annual growth (%)	
	2003	2006	2009	2003-2006	2006-2009	2003	2006	2009	2003-2006	2006-2009
Philippines	13252	14673	15528	3.4	1.9	35,565	35,091	34,524	-0.4	-0.5
National Capital Region	31730	37868	40838	5.9	2.5	57,172	56,123	54,753	-0.6	-0.8
Cordillera Autonomous Region	17848	18209	19007	0.7	1.4	30,563	33,001	31,483	2.6	-1.6
Ilocos Region	7209	7989	8030	3.4	0.2	26,072	24,723	26,706	-1.8	2.6
Cagayan Valley	7590	8131	8514	2.3	1.5	27,485	26,458	27,752	-1.3	1.6
Central Luzon	11092	11405	11636	0.9	0.7	32,896	33,915	31,717	1.0	-2.2
CALABARZON	13853	14371	14209	1.2	-0.4	38,902	38,429	37,007	-0.4	-1.3
MIMAROPA	12120	12604	13295	1.3	1.8	21,342	18,771	19,958	-4.3	2.0
Bicol Region	6214	6691	7650	2.5	4.5	21,383	20,572	20,300	-1.3	-0.4
Western Visayas	11699	13101	14699	3.8	3.8	23,346	23,324	22,418	0.0	-1.3
Central Visayas	12419	13918	14810	3.8	2.1	25,225	24,446	25,298	-1.0	1.1
Eastern Visayas	6326	6847	6993	2.6	0.7	20,560	21,112	20,606	0.9	-0.8
Zamboanga Peninsula	9482	10150	11173	2.3	3.2	18,911	20,645	19,214	2.9	-2.4
Northern Mindanao	13904	15670	17183	4.0	3.1	22,550	23,445	21,774	1.3	-2.5
Davao Region	12842	14161	15696	3.3	3.4	24,503	22,740	22,539	-2.5	-0.3
SOCCSKSARGEN	11112	11987	12665	2.5	1.8	23,242	19,321	21,494	-6.2	3.6
Autonomous Region of Muslim Mindanao	3290	3480	3572	1.9	0.9	16,184	12,816	12,467	-7.8	-0.9
Caraga	6516	7042	7579	2.6	2.4	18,202	18,923	18,115	1.3	-1.5



Figure 19. Factor Shares by institution (constant prices) Source: NIA, NSCB

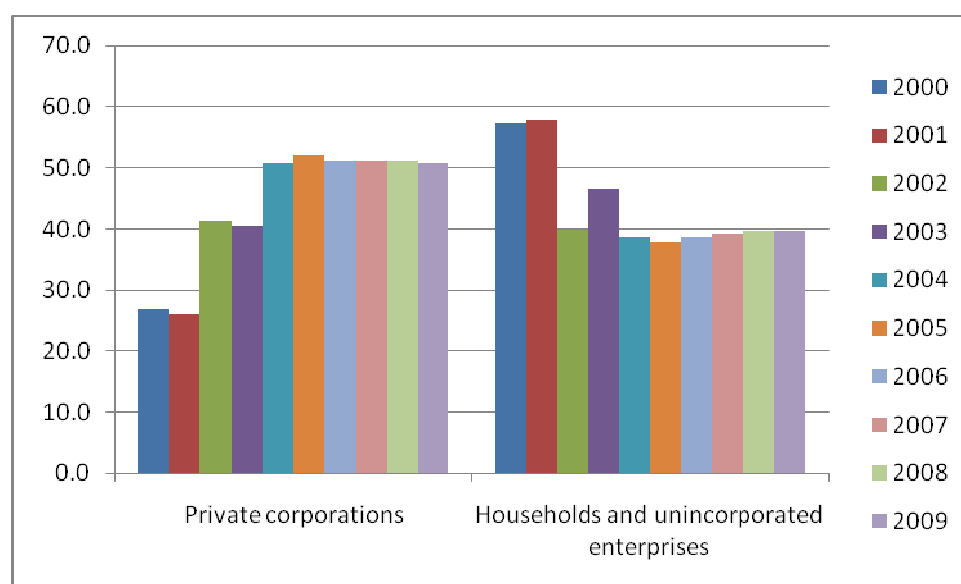


Figure 20. Output share of private corporations versus households

Meanwhile, receipts of households have been declining while that of the private sector has been increasing. The percentage of private corporations' receipts to total GDP has inched up from an average of 18.3% annually in 2000-2003 to 20.6% in 2004-2006. In contrast, that of the

households and unincorporated enterprises went down from average of 84.7% to 80.7% within the same period. Those of the general government and government corporations remained the almost same throughout the period (Figure 21). In 2004, the percentage of households' receipts to total receipts went down to 65.9% from 68.4% in 2003.

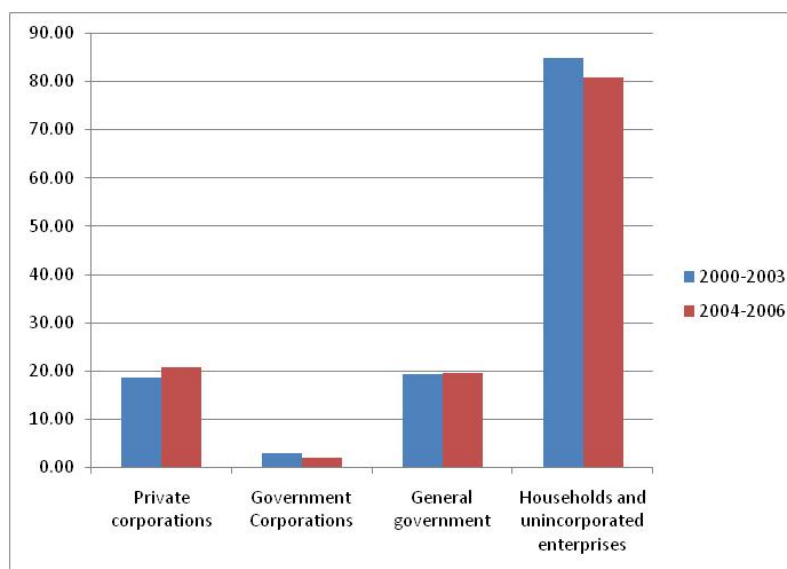


Figure 21. Total receipts as a percentage of the GDP by institution (current prices)
Source: NIA, NSCB

Likewise, the net operating surplus of the households has declined in relation to the total net operating surplus of all institutions. From an average of 71.2% in 2000-2003, the share went down to only 63% in 2004-2006. That of the private corporations meanwhile went up from 26.4% to 34.1% in the same period (Figure 22). The share of net operating surplus overall is way higher (at an average of 53 percent in 2004 to 2009) than compensation of employees (around 28 percent during the same period). Despite these shares being stable, the investment-GDP ratio declined continuously from 2000 to 2009. This suggests that firms did not translate the stable profit stream into investments and therefore a considerable portion of increased output growth did not accrue to households (Yap, 2011).

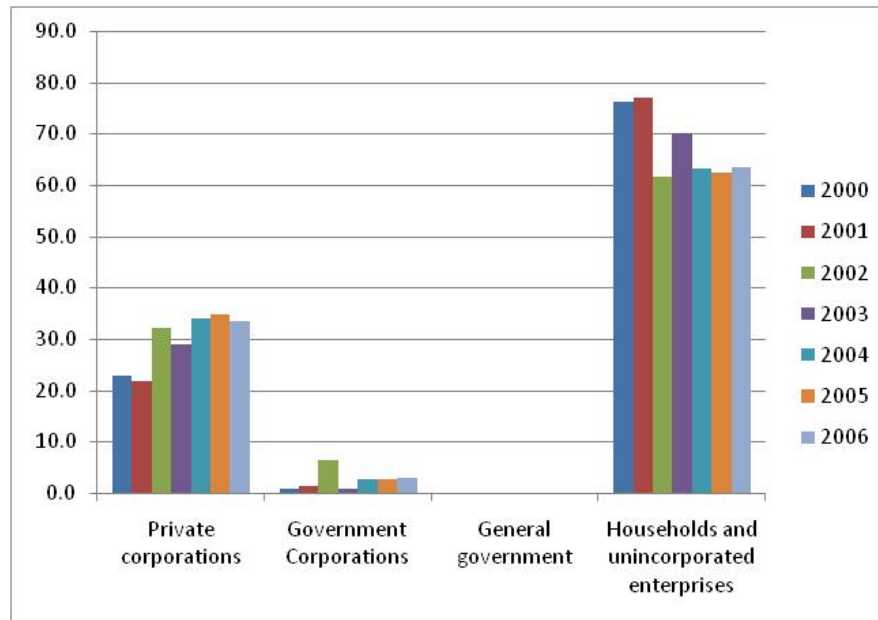


Figure 22. Share to total net operating surplus by institution; Source: NIA, NSCB

8. Summary and concluding remarks

The results show that poverty in the Philippines is not that responsive to growth. Previous studies have already highlighted that what matters in poverty reduction is not just the rate but also the nature of the economic growth. This paper augments the body of literature by looking into the experiences of various regions, owing to the fact that economic progress affects different geographic units differently. Likewise, the income distribution's role in these events has been looked into. We have shown that the rate and nature of economic growth, and income distribution have all been instrumental in the poverty changes that have occurred.

So why did poverty incidence rise during a period of fast economic progress? For one, the rate of growth was lacking in some of the poorest regions – such as ARMM and MIMAROPA. There was also lack of growth in low poverty rate but highly populated regions like CALABARZON and Central Luzon. While the country's output on a per capita basis grew by around 3.4 percent per year, these regions grew only by as high as 1.9 percent annually. These regions contributed a combined 43 percent of the total increment in the number of poor in 2003 to 2006.

More important to poverty reduction is not the growth rate but the nature of the growth that transpires. The agriculture sector has been outpaced by industry and services in terms of GVA and since majority of the poor still were agricultural households, this has serious implication to the aggregate poverty rate of the country. This clearly shows the importance of have broad-based, inclusive growth to make an impact to poverty situation.

Indeed, income distribution plays a vital role on whether poverty increases or decreases. Even with a high growth rate or with a pro-poor growth (manifested when the growth component turns in a negative thus poverty-reducing coefficient in the decomposition analysis) if the income inequality rises (especially during a crisis when there are no effective safety nets to weather the income shocks), poverty can still persist or even worsen further. The regions which have been continuously suffering from worsening income inequality are the Ilocos Region, Eastern Visayas, and CARAGA. These regions have been showing consistently increasing Gini indices. Meanwhile, there were considerable improvements in income distribution in poorest areas, which helped prevented a full blown increase in the poverty rate and for some even led to a decline. This was the experience of ARMM, Bicol Region, Zamboanga Peninsula, and SOCCSKSARGEN among others. Whether or not this has been the result of various interventions conducted in these poor regions is an important aspect to examine.

The poverty elasticity to regional output growth was estimated at a low -0.2 to -0.5, meaning that when regional output grows by 1 percent, poverty rate is reduced only by 0.2 to 0.5 percent. This is way lower than those in other literature. This however is expected because the growth does not only take into account growth in household income (as determined in the FIES) but growth in the output of all institutions. What is important to note is the role that inequality plays in accelerating the poverty-reduction effectiveness of growth. Under more equal distribution of income, the absolute value of poverty elasticity to growth is larger than under a more unequal distribution. Therefore, aside from growth, redistribution for the advantage of the poor is also very important to poverty reduction.

Meanwhile, observations from the categories of factor income suggest that the recent economic growth we have experienced did not accrue to households in general. There are reasons to believe that firms did not translate the stable profit stream into investments that could have benefited a broader base including those in the lower income deciles.

To achieve significant reduction in poverty, future economic growth has to be more inclusive. Creating an enabling environment that will generate more and better jobs will be essential to reducing poverty and inequality.

Bibliography

- Balisacan, A. M. March 2007. Why does poverty persist in the Philippines? Facts, Fancies, and Policies. Agriculture and Development Discussion Paper Series No. 2007-1. Southeast Asian Regional Center for Graduate Study and Research in Agriculture
- Balisacan A. M. and N. Fuwa. May 2004. Going Beyond Cross-Country Averages: Growth, Inequality and Poverty Reduction in the Philippines.
- Heltberg, Rasmus. (February 2002). The Poverty Elasticity of Growth. United Nations University World Institute for Development Economics Research (WIDER), Discussion Paper No. 2002/21.
- Islam, Rizwanul. (January 2004). The Nexus of Economic Growth, Employment and Poverty Reduction: An Empirical Analysis. Issues in Employment and Poverty Discussion Paper 14. Recovery and Reconstruction Department, International Labour Office.
- Reyes, C.M., A.D. Tabuga, C.D. Mina, R.D. Asis, and M.B.G. Datu. 2010. Chronic and transient poverty. PIDS Discussion Paper No. 2010-30. Makati City: Philippine Institute for Development Studies.

APPENDICES

A. Technical Notes

In this paper, the decomposition of poverty changes followed the procedure suggested by Ravallion and Huppi (1991) implemented in Stata (using the commands “gidecomposition” and “sedecomposition”). The datasets used in the decomposition analysis were based on 2003 prices; hence all used the 2003 provincial poverty lines. The per capita income for each dataset was deflated using the changes in the poverty thresholds. For instance, to deflate 2006 income based on 2003 prices, we created provincial deflators for 2006 income by dividing the 2006 thresholds with the 2003 thresholds for each of the provinces and used the quotient as the divisor for the current 2006 income levels. To illustrate this, the deflated income is computed using the following formula:

$$INC_{03} = (INC_{cu}) / \frac{Povline_{cu}}{Povline_{03}}$$

where INC_{03} is the per capita income for each household based on 2003 prices; INC_{cu} is the current per capita income, say 2006 or 2009; $Povline_{cu}$ is the current poverty line of the corresponding province and area, rural or urban, of the households; while $Povline_{03}$ refers to the 2003 poverty line. The table below shows the mean (unweighted) per capita income, current and 2003-based, for the 3 survey datasets. The poverty lines were obtained from the NSCB, these refer to the newly improved poverty thresholds and thus are better measures in tracking poverty changes over time.

The weights (i.e. individual weights) used for 2003 computations were those from NSCB while those for 2006 and 2009 were obtained from NSO. Take note that because there was no poverty line in 2003 for urban areas in Abra, we created the thresholds based on the ratio of urban to rural thresholds in 2009. We also used these new thresholds to calculate the price deflators for income.

B. Definition of terms

Agricultural Household - a household is considered agricultural if total income earned from agricultural activities is greater than or equal to income earned from non-agricultural activities

Engaged in agriculture - means that agriculture (includes, crop growing, fishing and animal husbandry) is the sector of the primary occupation of the individual

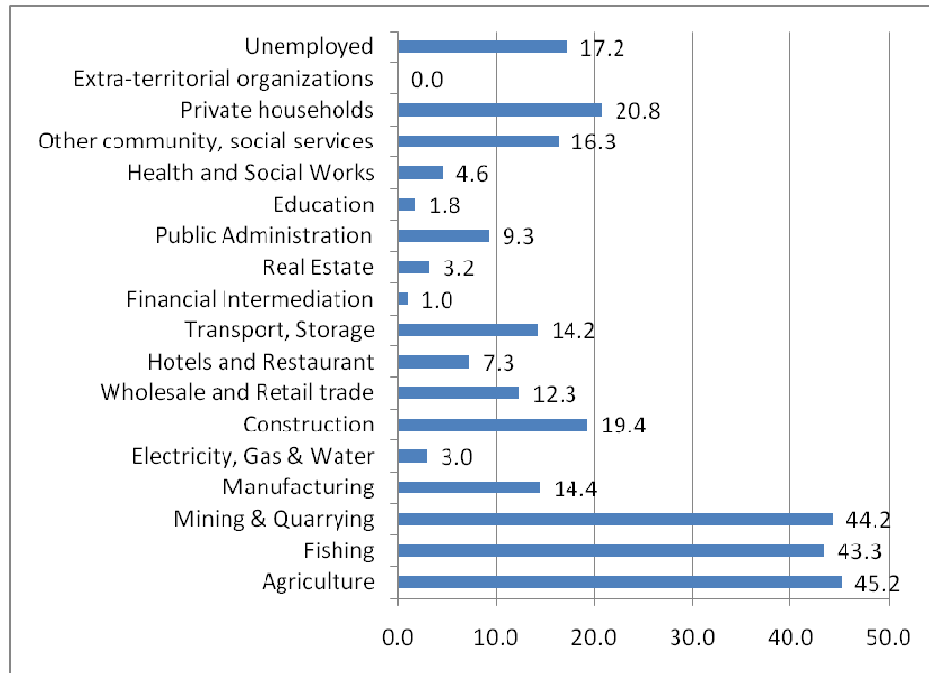
Growth – as used in the decomposition analysis, refers to the change in real income from one period to another

Redistribution – as used in the decomposition analysis, refers to the change in income distribution, should not be mistaken as the redistributive efforts of any entity

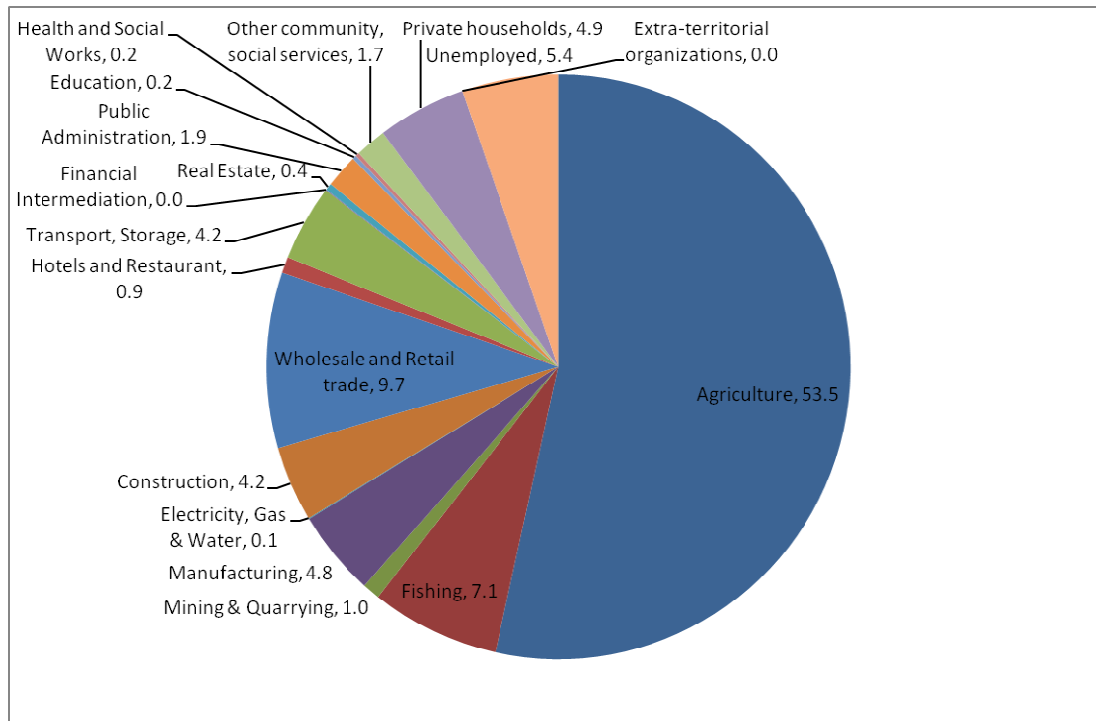
Real income – as used in the decomposition analysis, refers to per capita income based in 2003 prices computed from the Family Income and Expenditure Survey

Per capita GDP growth – refers to annual change in GDP per capita obtained from the National or Regional Income Accounts

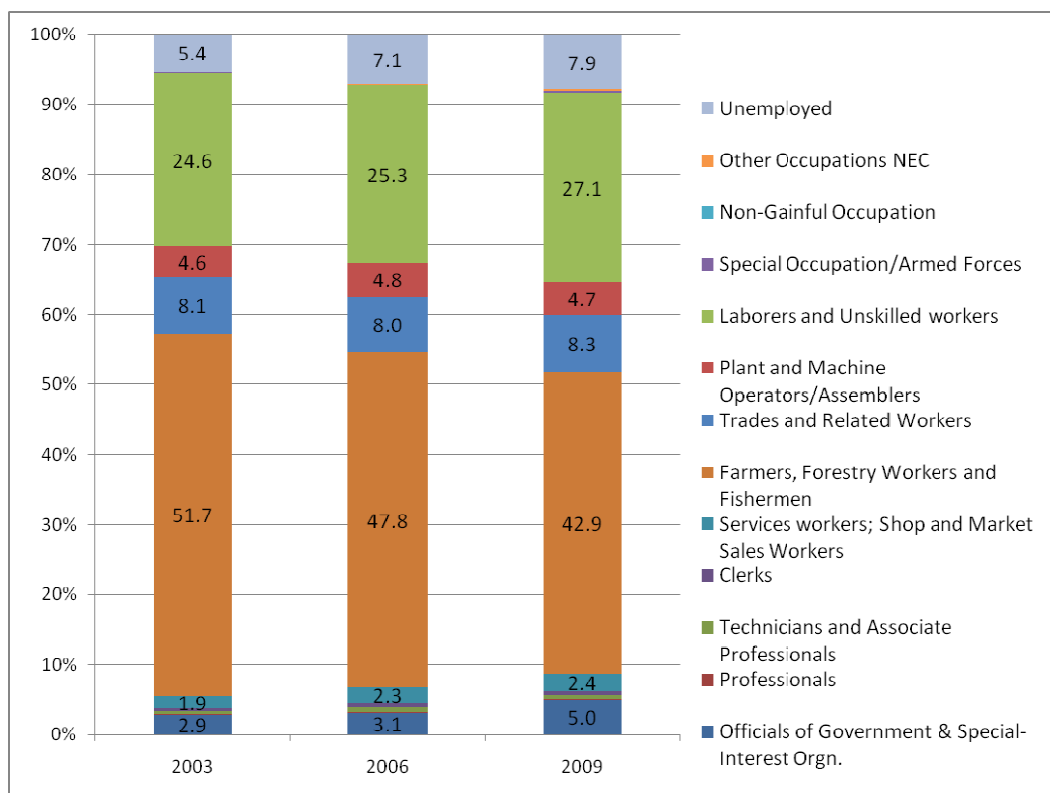
APPENDIX FIGURES



Appendix Figure 1. Poverty incidence among workers by kind of business in primary occupation, 2009
(Note: Authors' estimates; Sources of basic data: Merged FIES 2009 and LFS 2010- January)



Appendix Figure 2. Share to total poor by kind of business in primary occupation of workers, 2009
(Note: Authors' estimates; Sources of basic data: Merged FIES 2009 and LFS 2010- January)



Appendix Figure 3. Distribution of the poor by type of occupation of head

APPENDIX TABLES

- Appendix Table 1. Decomposition analysis results by region
- Appendix Table 2. Poverty rate, per capita growth, Gini coefficient and per capita income by region, 2003, 2006, 2009
- Appendix Table 3. Share of agricultural households in the total number of poor
- Appendix Table 4. Poverty rate by type of households, (% of individuals)*
- Appendix Table 5. Gini Decomposition by Income Source, 2009
(marginal effects, bootstrapped errors)
- Appendix Table 6. Mean per capita income by decile and region, 2003 to 2009 (3 parts)
- Appendix Table 7. Summary statistics of the variables used in the elasticity model
- Appendix Table 8. Results of Random-effects GLS regression, using growth of mean per capita income
- Appendix Table 9. Factor shares by institution, in million pesos (current prices)
- Appendix Table 10. Factor shares by institution, in million pesos (2000 prices)
- Appendix Table 11. Total receipts by institution, in million pesos (at current prices)

Appendix Table 1. Decomposition analysis results by region 1/														
Region	Poverty rate (NSCB Official)			Poverty rate (Author's estimates), 2003=100 ^{2/}			Poverty Change		2003-2006			2006-2009		
	2003	2006	2009	2003	2006	2009	2003- 2006	2006- 2009	Growth component	Redistribution component	Interaction component	Growth component	Redistribution component	Interaction component
Philippines	24.9	26.4	26.5	24.9	26.4	26.5	1.46	0.08	1.077	0.384	0.002	1.065	-1.118	0.133
National Capital Region	3.2	5.4	4	3.2	5.4	4.0	2.11	-1.39	0.26	1.801	0.046	0.541	-1.738	-0.196
Cordillera Autonomous Region	21.7	23	22.9	21.7	23.7	22.9	2.00	-0.74	-2.593	4.131	0.462	1.714	-2.565	0.108
Ilocos Region	22.8	26.6	23.3	22.8	26.8	23.3	3.94	-3.45	3.082	1.115	-0.257	-4.263	1.398	-0.585
Cagayan Valley	19.6	20	18.8	19.6	19.6	18.8	0.02	-0.81	1.288	-1.083	-0.184	-2.283	1.396	0.08
Central Luzon	12.4	15.2	15.3	12.4	15.2	15.3	2.90	0.02	-1.124	4.806	-0.786	3.195	-1.915	-1.26
CALABARZON	12.1	12.3	13.9	12.1	13.1	13.9	1.07	0.77	1.066	0.115	-0.115	1.206	-0.493	0.056
MIMAROPA	37.5	42.2	35	37.5	40.7	35.0	3.22	-5.72	3.727	-0.995	0.487	-3.706	-1.472	-0.539
Bicol Region	45.8	45.2	45.1	45.8	45.9	45.1	0.14	-0.80	0.595	-0.919	0.466	1.079	-1.448	-0.433
Western Visayas	30.6	28.6	31.2	30.7	28.3	31.2	-2.30	2.83	0.417	-2.752	0.035	2.466	0.139	0.22
Central Visayas	37.2	38.8	35.5	37.2	37.8	35.5	0.56	-2.29	0.961	0.153	-0.55	-1.606	-0.179	-0.507
Eastern Visayas	37.6	39	41.4	37.6	38.8	41.4	1.12	2.66	-0.892	1.908	0.107	1.352	0.848	0.459
Zamboanga Peninsula	45.7	39.8	43.1	45.7	41.7	43.1	-4.03	1.36	-2.713	-1.244	-0.073	3.485	-2.929	0.808
Northern Mindanao	38.8	39.7	39.6	38.8	38.6	39.6	-0.22	0.98	-2.443	2.235	-0.015	3.473	-3.601	1.106
Davao Region	31	31.7	31.3	31.0	31.2	31.3	0.21	0.17	2.957	-2.598	-0.155	0.474	-0.558	0.251
SOCCSKSARGEN Autonomous Region of Muslim Mindanao	33.1	33.1	35.7	33.1	34.3	35.7	1.15	1.42	12.119	-10.544	-0.42	-5.72	8.023	-0.881
Caraga	31.4	42.8	45.9	31.4	43.5	45.9	12.08	2.40	19.785	-8.81	1.103	2.011	-0.789	1.174
	44.7	44	47.8	44.7	42.8	47.8	-1.90	4.98	-4.748	1.853	0.998	2.174	1.644	1.157

1/ Based on the poverty changes decomposition routines in Stata proposed by Ravallion and Huppi.

2/ Per capita income for all years are based on 2003 prices, poverty thresholds used for all are that for 2003

Appendix Table 2. Poverty rate, per capita growth, Gini coefficient and per capita income by region, 2003, 2006, 2009														
Region	Mean annual per capita GDP growth		Poverty rate			Number of poor (in thousands)			Gini coefficient			Mean per capita real income (in 2003 pesos)		
	2003-2006	2006-2009	2003	2006	2009	2003	2006	2009	2003	2006	2009	2003	2006	2009
Philippines	3.4	1.9	24.9	26.4	26.5	19,797	22,173	23,142	0.4871	0.4837	0.4743	35,565	35,091	34,524
National Capital Region	5.9	2.5	3.2	5.4	4	347	594	448	0.4293	0.4328	0.4280	57,172	56,123	54,753
Cordillera Autonomous Region	0.7	1.4	21.7	23	22.9	300	338	346	0.4583	0.5028	0.4751	30,563	33,001	31,483
Ilocos Region	3.4	0.2	22.8	26.6	23.3	953	1,193	1,085	0.4118	0.4125	0.4280	26,072	24,723	26,706
Cagayan Valley	2.3	1.5	19.6	20	18.8	528	564	545	0.4598	0.4390	0.4603	27,485	26,458	27,552
Central Luzon	0.9	0.7	12.4	15.2	15.3	1,084	1,407	1,457	0.3715	0.4123	0.3827	32,896	33,915	31,717
CALABARZON	1.2	-0.4	12.1	12.3	13.9	1,245	1,303	1,566	0.4268	0.4244	0.4290	38,902	38,429	37,007
MIMAROPA	1.3	1.8	37.5	42.2	35	907	1,122	981	0.4560	0.4461	0.4337	21,342	18,771	19,958
Bicol Region	2.5	4.5	45.8	45.2	45.1	2,200	2,336	2,422	0.4870	0.4786	0.4491	21,383	20,572	20,300
Western Visayas	3.8	3.8	30.6	28.6	31.2	1,856	1,849	2,113	0.4668	0.4488	0.4431	23,346	23,324	22,418
Central Visayas	3.8	2.1	37.2	38.8	35.5	2,175	2,426	2,368	0.4821	0.4699	0.4691	25,225	24,446	25,298
Eastern Visayas	2.6	0.7	37.6	39	41.4	1,417	1,565	1,732	0.4929	0.5027	0.5107	20,560	21,112	20,606
Zamboanga Peninsula	2.3	3.2	45.7	39.8	43.1	1,326	1,274	1,361	0.5354	0.5205	0.5014	18,911	20,645	19,214
Northern Mindanao	4.0	3.1	38.8	39.7	39.6	1,383	1,530	1,587	0.4984	0.5084	0.4886	22,550	23,445	21,774
Davao Region	3.3	3.4	31	31.7	31.3	1,202	1,259	1,279	0.4715	0.4360	0.4461	24,503	22,740	22,539
SOCCSKSARGEN	2.5	1.8	33.1	33.1	35.7	1,137	1,204	1,332	0.5122	0.4264	0.4742	23,242	19,321	21,494
Autonomous Region of Muslim Mindanao	1.9	0.9	31.4	42.8	45.9	816	1,232	1,389	0.3675	0.3190	0.2997	16,184	12,816	12,467
Caraga	2.6	2.4	44.7	44	47.8	921	979	1,131	0.4462	0.4705	0.4903	18,202	18,923	18,115

Appendix Table 3. Share of agricultural households in the total number of poor			
Region	2003	2006	2009
NCR	2.9	2.66	0.7
CAR	75.7	76.49	64.1
Ilocos Region	44.2	40.14	37.7
Cagayan Valley	78.9	78.05	74.6
Central Luzon	35.8	32.70	35.7
CALABARZON	36.1	39.85	33.6
MIMAROPA	66.9	63.52	59.8
Bicol Region	56.4	46.55	45.0
Western Visayas	57.8	60.51	53.6
Central Visayas	45.9	41.60	36.2
Eastern Visayas	61.4	62.77	54.3
Zamboanga Peninsula	69.0	68.53	64.5
Northern Mindanao	67.1	60.68	54.5
Davao Region	70.4	65.85	61.9
SOCCSKSARGEN	71.2	70.76	67.9
Autonomous Region of Muslim Mindanao	84.0	84.04	81.8
Caraga	63.7	52.52	43.2
Philippines	57.9	54.6	50.8

Appendix Table 4. Poverty rate by type of households, (% of individuals)*				
Year	Agricultural households	Non-agricultural households	Household head engaged in agriculture	Household head engaged elsewhere
2003	54.63	14.26	45.76	12.54
2006	57.06	16.04	47.23	17.66
2009	56.8	17.07	47.45	19.75

*Authors' estimates, weighted, using new poverty thresholds

A household is considered agricultural if total income earned from agricultural activities is greater than or equal to income earned from non-agricultural activities

Engaged in agriculture means that agriculture (includes, crop growing, fishing and animal husbandry) is the sector of the primary occupation of the individual.

Sources of basic data: NSO and NSCB

Appendix Table 5. Gini Decomposition by Income Source, 2009 (marginal effects, bootstrapped errors)							
Bootstrap statistics		Number of obs = 38400					
		Replications = 50					
Variable	Reps	Observed	Bias	Std. Err.	[95% Conf.	Interval]	
Wages, agricultural	50	-0.04745	0.00024	0.00064	-0.0487	-0.0462	(N)
					-0.0485	-0.0462	(P)
					-0.0485	-0.0465	(BC)
Wages, non-agricultural	50	0.08219	0.00031	0.00427	0.0736	0.0908	(N)
					0.0753	0.0902	(P)
					0.0731	0.0902	(BC)
Other income	50	-0.00079	0.00032	0.00473	-0.0103	0.0087	(N)
					-0.0080	0.0093	(P)
					-0.0100	0.0093	(BC)
Remittances, domestic	50	-0.02492	-0.00005	0.00058	-0.0261	-0.0237	(N)
					-0.0262	-0.0241	(P)
					-0.0262	-0.0239	(BC)
Remittances, foreign	50	0.05017	-0.00025	0.00185	0.0464	0.0539	(N)
					0.0470	0.0532	(P)
					0.0473	0.0547	(BC)
Entrepreneurial income, agricultural	50	-0.08091	-0.00015	0.00172	-0.0844	-0.0775	(N)
					-0.0841	-0.0780	(P)
					-0.0841	-0.0767	(BC)
Entrepreneurial income, non-agricultural	50	0.02171	-0.00042	0.00287	0.0159	0.0275	(N)
					0.0170	0.0265	(P)
					0.0170	0.0265	(BC)
Note:	N =	normal					
	P =	percentile					
	BC =	bias-corrected					

Appendix Table 6. Mean per capita income by decile and region, 2003 to 2009 1/ (Part 1 of 3)										
Income decile	Average per capita income			Growth rate		Average per capita income			Growth rate	
	2003	2006	2009	2003-2006	2006-2009	2003	2006	2009	2003-2006	2006-2009
	Ilocos Region					Cagayan Valley				
1	7,468	7,215	7,626	-3.4	5.7	7,336	7,178	7,327	-2.1	2.1
2	10,838	10,498	11,147	-3.1	6.2	10,336	10,243	10,410	-0.9	1.6
3	13,346	12,905	13,445	-3.3	4.2	12,702	12,527	12,787	-1.4	2.1
4	15,920	15,053	15,840	-5.4	5.2	15,016	15,058	14,842	0.3	-1.4
5	18,774	17,843	18,661	-5.0	4.6	17,834	17,586	17,347	-1.4	-1.4
6	22,451	21,230	22,382	-5.4	5.4	21,104	20,859	20,740	-1.2	-0.6
7	27,524	26,027	27,528	-5.4	5.8	25,934	26,133	25,677	0.8	-1.7
8	35,090	33,036	34,203	-5.9	3.5	33,358	33,581	33,976	0.7	1.2
9	48,554	45,143	46,679	-7.0	3.4	48,113	48,480	47,761	0.8	-1.5
10	96,270	90,622	107,108	-5.9	18.2	116,285	100,226	114,593	-13.8	14.3
Total	26,072	24,723	26,706	-5.2	8.0	27,485	26,458	27,552	-3.7	4.1
	Central Luzon					Bicol Region				
1	10,170	9,329	9,221	-8.3	-1.2	5,166	5,610	6,081	8.2	8.1
2	14,801	13,641	13,615	-7.8	-0.2	7,355	7,756	8,280	5.3	6.5
3	18,226	17,043	17,128	-6.5	0.5	9,109	9,333	9,846	2.4	5.3
4	21,785	20,662	20,341	-5.2	-1.6	11,129	11,107	11,388	-0.2	2.5
5	25,848	24,551	24,066	-5.0	-2.0	13,271	13,011	13,467	-2.0	3.4
6	30,543	29,365	28,162	-3.9	-4.1	15,816	15,458	16,137	-2.3	4.3
7	36,383	35,565	34,055	-2.2	-4.2	19,618	19,106	19,841	-2.6	3.8
8	45,285	44,541	42,401	-1.6	-4.8	25,836	24,856	25,039	-3.9	0.7
9	59,931	60,243	56,725	0.5	-5.8	38,831	37,384	36,450	-3.8	-2.5
10	106,883	121,128	104,928	13.3	-13.4	100,818	95,835	88,448	-5.1	-8.0
Total	32,896	33,915	31,717	3.1	-6.5	21,383	20,572	20,300	-3.9	-1.3
	CALABARZON					MIMAROPA				
1	9,502	9,200	9,529	-3.2	3.6	5,638	5,118	5,705	-9.2	11.5
2	14,389	14,245	14,066	-1.0	-1.3	8,042	7,431	8,291	-7.6	11.6
3	18,522	18,339	17,636	-1.0	-3.8	9,778	8,980	10,056	-8.2	12.0
4	22,895	22,709	21,509	-0.8	-5.3	11,688	10,850	11,817	-7.2	8.9
5	27,948	27,535	25,930	-1.5	-5.8	13,819	13,063	13,999	-5.5	7.2
6	34,056	33,029	31,555	-3.0	-4.5	16,480	15,670	16,748	-4.9	6.9
7	41,755	40,282	38,416	-3.5	-4.6	20,137	19,009	20,381	-5.6	7.2
8	52,593	50,944	48,964	-3.1	-3.9	26,487	24,069	26,298	-9.1	9.3
9	72,100	68,683	65,969	-4.7	-4.0	37,350	34,644	37,383	-7.2	7.9
10	147,009	135,236	138,845	-8.0	2.7	100,036	78,114	83,876	-21.9	7.4
Total	38901.74	38428.97	37007.16	-1.2	-3.7	21,342	18,771	19,958	-12.0	6.3

^{1/} Authors' estimates using FIES, per capita income are based on 2003 prices

Appendix Table 6. Mean per capita income by decile and region, 2003 to 2009 1/ (Part 2 of 3)

Income decile	Average per capita income			Growth rate		Average per capita income			Growth rate	
	2003	2006	2009	2003-2006	2006-2009	2003	2006	2009	2003-2006	2006-2009
	Western Visayas					Central Visayas				
1	5,967	6,424	6,294	7.7	-2.0	5,014	5,204	5,722	3.7	9.5
2	8,743	9,012	8,822	3.1	-2.1	7,987	7,916	8,499	-0.9	7.1
3	10,852	11,110	10,804	2.4	-2.8	10,339	10,041	10,700	-2.9	6.4
4	13,042	12,996	13,026	-0.4	0.2	12,782	12,497	13,087	-2.3	4.6
5	15,525	15,503	15,422	-0.1	-0.5	15,822	15,516	15,903	-2.0	2.5
6	18,602	18,631	18,473	0.2	-0.9	19,590	19,225	19,342	-1.9	0.6
7	22,787	22,570	22,382	-1.0	-0.8	24,667	24,156	24,279	-2.1	0.5
8	29,442	29,662	29,072	0.7	-2.0	32,849	31,659	31,920	-3.7	0.8
9	42,478	42,867	42,668	0.9	-0.5	47,887	45,515	47,087	-5.1	3.4
10	96,752	91,989	89,633	-4.9	-2.6	104,208	94,431	98,917	-9.9	4.6
Total	23,346	23,324	22,418	-0.1	-3.9	25,225	24,446	25,298	-3.1	3.4
	Eastern Visayas					Zamboanga Peninsula				
1	5,470	4,959	5,044	-9.3	1.7	3,297	3,853	4,347	16.8	12.8
2	7,524	7,188	7,078	-4.5	-1.5	5,109	5,832	6,203	14.2	6.4
3	9,100	8,931	8,626	-1.9	-3.4	6,475	7,579	7,866	17.0	3.8
4	10,690	10,566	10,171	-1.2	-3.7	8,295	9,268	9,498	11.7	2.5
5	12,605	12,465	12,078	-1.1	-3.1	10,198	11,206	11,534	9.9	2.9
6	15,119	15,191	14,338	0.5	-5.6	12,682	13,706	14,186	8.1	3.5
7	18,604	18,924	18,044	1.7	-4.7	16,197	17,606	17,840	8.7	1.3
8	24,308	24,916	23,432	2.5	-6.0	21,592	24,727	23,277	14.5	-5.9
9	36,780	39,626	37,329	7.7	-5.8	34,478	38,308	35,514	11.1	-7.3
10	95,219	98,677	103,045	3.6	4.4	86,519	90,633	91,181	4.8	0.6
Total	20,560	21,112	20,606	2.7	-2.4	18,911	20,645	19,214	9.2	-6.9
	Northern Mindanao					Davao Region				
1	4,714	4,863	4,819	3.2	-0.9	5,401	5,672	5,581	5.0	-1.6
2	7,105	7,145	7,113	0.6	-0.4	8,172	8,116	8,239	-0.7	1.5
3	9,050	8,997	8,985	-0.6	-0.1	10,598	10,400	10,436	-1.9	0.4
4	11,087	11,165	10,911	0.7	-2.3	12,911	12,666	12,573	-1.9	-0.7
5	13,443	13,653	13,084	1.6	-4.2	15,804	15,393	15,116	-2.6	-1.8
6	16,161	16,637	16,253	2.9	-2.3	19,206	18,722	18,214	-2.5	-2.7
7	20,498	21,486	20,779	4.8	-3.3	23,663	23,133	22,078	-2.2	-4.6
8	28,114	29,778	27,718	5.9	-6.9	30,561	29,561	28,275	-3.3	-4.4
9	42,961	44,323	41,063	3.2	-7.4	42,687	41,148	39,757	-3.6	-3.4
10	96,056	101,324	90,136	5.5	-11.0	104,315	81,688	88,265	-21.7	8.1
Total	22,550	23,445	21,774	4.0	-7.1	24,503	22,740	22,539	-7.2	-0.9

1/ Authors' estimates using FIES, per capita income are based on 2003 prices

Appendix Table 6. Mean per capita income by decile and region, 2003 to 2009 1/ (Part 3 of 3)										
Income decile	Average per capita income			Growth rate		Average per capita income			Growth rate	
	2003	2006	2009	2003-2006	2006-2009	2003	2006	2009	2003-2006	2006-2009
	Soccksargen					ARMM				
1	5,495	5,616	5,397	2.2	-3.9	5,859	5,515	5,655	-5.9	2.5
2	7,879	7,809	7,813	-0.9	0.0	7,913	7,135	7,414	-9.8	3.9
3	9,656	9,664	9,471	0.1	-2.0	9,444	8,382	8,331	-11.2	-0.6
4	11,645	11,617	11,352	-0.2	-2.3	10,854	9,497	9,356	-12.5	-1.5
5	13,843	13,751	13,517	-0.7	-1.7	12,183	10,599	10,303	-13.0	-2.8
6	16,598	16,347	16,309	-1.5	-0.2	13,856	11,853	11,417	-14.5	-3.7
7	20,399	19,624	20,043	-3.8	2.1	16,096	13,324	12,619	-17.2	-5.3
8	25,692	24,722	25,860	-3.8	4.6	19,112	15,365	14,460	-19.6	-5.9
9	36,166	34,616	37,665	-4.3	8.8	25,318	18,830	18,138	-25.6	-3.7
10	115,786	75,583	92,898	-34.7	22.9	53,339	39,529	36,525	-25.9	-7.6
Total	23,242	19,321	21,494	-16.9	11.2	16,184	12,816	12,467	-20.8	-2.7
	NCR					CAR				
1	16,351	14,969	15,395	-8.5	2.8	6,763	6,067	6,418	-10.3	5.8
2	24,094	22,645	22,043	-6.0	-2.7	10,028	9,148	9,775	-8.8	6.9
3	29,882	28,456	27,723	-4.8	-2.6	13,190	12,046	12,769	-8.7	6.0
4	35,211	34,425	33,441	-2.2	-2.9	16,101	15,133	16,283	-6.0	7.6
5	41,733	41,283	39,998	-1.1	-3.1	20,374	19,220	20,361	-5.7	5.9
6	49,904	49,930	48,335	0.1	-3.2	25,596	24,364	25,792	-4.8	5.9
7	60,577	62,054	59,335	2.4	-4.4	32,398	31,575	32,195	-2.5	2.0
8	77,702	80,290	76,685	3.3	-4.5	41,652	42,882	41,769	3.0	-2.6
9	107,097	110,513	103,512	3.2	-6.3	60,594	63,229	59,913	4.3	-5.2
10	244,389	227,088	219,164	-7.1	-3.5	116,503	143,576	127,817	23.2	-11.0
Total	57,172	56,123	54,753	-1.8	-2.4	30,563	33,001	31,483	8.0	-4.6
	CARAGA									
1	4,903	4,807	4,617	-2.0	-4.0					
2	6,957	6,969	6,469	0.2	-7.2					
3	8,581	8,620	7,920	0.5	-8.1					
4	10,120	10,335	9,448	2.1	-8.6					
5	11,806	12,134	11,043	2.8	-9.0					
6	14,194	14,574	13,132	2.7	-9.9					
7	17,918	17,827	16,207	-0.5	-9.1					
8	23,382	23,364	20,749	-0.1	-11.2					
9	34,801	33,691	30,587	-3.2	-9.2					
10	69,659	81,706	86,392	17.3	5.7					
Total	18,202	18,923	18,115	4.0	-4.3					

1/ Authors' estimates using FIES, per capita income are based on 2003 prices

Appendix Table 7. Summary statistics of the variables used in the elasticity model					
Variable	Obs	Mean	Std. Dev.	Min	Max
Level/rate					
Poverty rate	51	30.64	12.31	3.20	47.80
Gini	51	0.45	0.05	0.30	0.54
GRDP per capita	51	12479	7310	3290	40838
GRDP, level	51	74400000	92200000	9955525	466000000
Share of bottom 40	51	0.1898	0.0302	0.1300	0.2900
Share of bottom 40, initial level (2003)	51	0.1859	0.0275	0.1300	0.2400
Per capita income, households	51	25900	9581	12467	57172
Labor productivity	51	32599	19672	10910	111864
<i>In log form</i>					
Poverty rate	51	3.289394	0.6134254	1.163151	3.867026
Gini	51	-0.8000652	0.112682	-1.203973	-0.6161861
GRDP per capita	51	9.299718	0.5121629	8.098643	10.61737
GRDP, level	51	17.70044	0.8571962	16.11364	19.95903
Share of bottom 40	51	-1.673548	0.1538871	-2.040221	-1.237874
Share of bottom 40, initial level (2003)	51	-1.693565	0.1503285	-2.040221	-1.427116
Per capita income, households	51	10.10842	0.3168301	9.43084	10.95382
Labor productivity	51	10.2648	0.4883957	9.297412	11.62504

Appendix Table 8. Results of Random-effects GLS regression, using growth of mean per capita income			
Dependent variable: Log of poverty rate	Estimation 1	Estimation 2	Estimation 3
All regions			
Log of mean per capita	-1.4029 ***	-1.7404 ***	-1.8696 ***
Luzon dummy	-0.1312	-0.0622	0.0498
Log of bottom 40 share for 2003	-1.1292 **		
Log of bottom 40 share		-1.0189 ***	
Log of Gini			1.5217 ***
Constant	15.6041 ***	19.1988 ***	23.3881 ***
chi2	171.1284	264.0518	229.2395
N	51	51	51
R2-overall	0.9112	0.9351	0.9279
Regions with more equal distribution			
Log of mean per capita	-1.5979 ***	-1.9772 ***	-1.9957 ***
Luzon dummy	-0.0258	0.0604	0.1178
Log of bottom 40 share for 2003	-1.6581 **		
Log of bottom 40 share		-1.5404 ***	
Log of Gini			1.6120 ***
Constant	16.6695 ***	20.6933 ***	24.6814 ***
chi2	200.3018	311.8114	255.3478
N	39	39	39
R2-overall	0.9409	0.9583	0.9505

legend: *p<.05; **p<.01;***p<.001

Appendix Table 9. Factor shares by institution, in million pesos (current prices)						
Year	Private corporations	Government Corporations	General government	Households and unincorporated enterprises	Import Taxes	GDP
2000	897,909	119,307	320,538	1,921,729	95,244	3,354,727
2001	943,862	144,374	338,725	2,102,773	101,740	3,631,474
2002	1,605,789	257,750	362,762	1,549,390	107,539	3,883,230
2003	1,747,648	116,902	378,646	2,010,161	63,045	4,316,402
2004	2,474,493	131,545	384,102	1,881,415	-	4,871,555
2005	2,836,742	137,606	416,475	2,053,216	-	5,444,039
2006	3,091,695	153,263	453,806	2,332,400	-	6,031,164
2007	3,396,825	166,155	475,458	2,610,181	-	6,648,619
2008	3,793,043	170,467	510,727	2,935,133	-	7,409,370
2009	3,898,267	163,128	577,159	3,040,364	-	7,678,918

Source: National Income Accounts, NSCB

Appendix Table 10. Factor shares by institution, in million pesos (2000 prices)						
Year	Private corporations	Government Corporations	General government	Households and unincorporated enterprises	Import Taxes	GDP
2000	897,909	119,307	320,538	1,921,729	95,244	3,354,727
2001	883,766	135,182	317,158	1,968,889	95,262	3,400,257
2002	1,459,808	234,318	329,784	1,408,536	97,763	3,530,209
2003	1,535,719	102,726	332,729	1,766,398	55,400	3,792,972
2004	2,051,818	109,075	318,493	1,560,046	-	4,039,432
2005	2,185,471	106,014	320,859	1,581,831	-	4,194,175
2006	2,241,983	111,141	329,083	1,691,371	-	4,373,578
2007	2,396,011	117,200	335,373	1,841,138	-	4,689,722
2008	2,447,125	109,979	329,501	1,893,634	-	4,780,239
2009	2,436,417	101,955	360,724	1,900,228	-	4,799,324

Source: National Income Accounts, NSCB; Note: CPI was used to deflate the prices

Appendix Table 11. Total receipts by institution, in million pesos (at current prices)				
Year	Private corporations	Government Corporations	General government	Households and unincorporated enterprises
2000	570,003	63,866	631,181	2,891,534
2001	601,354	75,090	717,472	3,163,362
2002	802,034	238,466	750,523	3,088,891
2003	838,405	56,009	819,159	3,710,620
2004	1,013,874	90,161	931,637	3,931,578
2005	1,139,636	99,816	1,034,564	4,409,464
2006	1,207,914	127,361	1,227,674	4,849,176

Source: National Income Accounts,
NSCB