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Abstract
This article investigates (i) the extent to which the differences in the standard of living between regions in Thailand is due to differences in the returns to characteristics or differences in the characteristics themselves; and (ii) whether the current allocation of fiscal expenditures by the central authorities is related to the main determinants of the spatial disparities in welfare among provinces. The analysis reveals that the lower level of welfare in the rural areas within any given region, is due primarily because of differences in characteristics of the population in rural vs. urban areas. Differences in returns generally account for the most part of the welfare differences between urban areas of different regions and Bangkok or rural areas of other regions compared with the rural North East. The analysis of fiscal expenditures and its relation to welfare disparities suggests that there are many opportunities to improve the role of fiscal expenditure allocation from the central government as an instrument of addressing the needs of provinces in terms of low returns.
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1. Introduction

Over the last ten years Thailand has experienced rapid economic growth in real GDP that has been accompanied with substantial declines in the poverty rate and inequality. However, the declines in poverty and inequality were not distributed evenly across regions. While poverty rates have declined in all of Thailand’s regions, inequality seems to have increased between 2000 and 2009 in the Northeast region and in Bangkok.

The regional dimension of inequality in Thailand and the extent to which growth is sufficient for reductions in inequalities continues to be at the center of policy in Thailand (Kmonwatananisa, 2008). Thailand policy makers have been taking steps to address the regional inequalities in their country for some decades now. However, with the decentralization of governance and service delivery becoming a national priority since the 2001 Decentralization Act, the concerns of the central government about the inevitable trade-offs associated with the promotion of regional and spatial equity and overall economic efficiency, have multiplied.

[Figure 1 here]

Among the variety of programs used to address regional inequalities, some programs are targeted towards poor regions, while other programs are targeted directly towards poor people. This dichotomy reflects a lack of consensus on how to deal with the problem of differences in the standard of living between regions (leading and lagging regions) and within regions (urban vs. rural areas within a given region).

The lack of consensus on these two policy strategies may be attributed to two contrasting perspectives about the determinants of spatial differences in welfare: concentration vs. geography. The “concentration” hypothesis posits that poor areas arise from the persistent concentration in these areas of individuals with personal attributes that inhibit growth in their living standards (e.g. low education). According to this view, individuals with identical attributes will have the same growth prospects, independently of where they live. Free migration induced by income differentials between regions will, holding all else equal, reduce any wage premium that may be associated with living in a specific geographic region where labor might have been relatively scarce initially. The policy focus that then emerges centers on enhancing individual characteristics (such as education and health) that can improve a person’s
ability to make a better living. Examples of such programs include the conditional cash transfer programs such as PNPM in Indonesia, Oportunidades in Mexico, Bolsa Familia in Brazil, and Familias en Acción in Colombia and among others.

The alternative “geography” hypothesis suggests that the primary cause of poverty and weak growth of living standards over time is the returns to individual characteristics in different geographic locations. In areas better endowed with local public goods, such as infrastructure and other basic services (electricity, water and sanitation), productivity levels and economic returns to the characteristics of the population tend to be higher, thus facilitating the exit of poor households from poverty. According to this view, given two individuals with identical attributes, the one living in an area with a lower endowment of public goods is more likely to face economic stagnation and poverty. The policy focus that emerges from this perspective targets poor regions by increasing access to infrastructure and other basic services, frequently accompanied by institutions for local governance and social capital, which aim to reduce extreme poverty in poor regions by improving access to public infrastructure.

In reality, of course, both of these explanations play a role in the observed differences in welfare across space. Ex ante, the human capital theory of migration would predict that the concentration effect is the primary explanation for the differences in welfare across regions, because migration is expected to equalize returns to a given set of observable characteristics across regions within a country. However, the role of migration in equalizing returns to characteristics may be limited by a number of factors such as monetary and psychic costs of migration (transportation, strong social ties and cultural values), and uncertainty about the benefits from migration (low probability of getting a high paying job or risk of unemployment). Another important factor is the presence of agglomeration economies brought to prominence by new economic geography theories (e.g. Krugman, 1991). “Agglomeration economies” summarize all the external economies of scale that arise from economic interactions between producers located next to each other in selected areas or regions of a country. These include the benefits of localization (being near other producers of the same commodity or service) as well as urbanization (being close to other producers of a wide range of commodities and services). In the presence of agglomeration economies, the size of the market grows in the destination region as labor migrates in response to an initial wage differential, and, through a variety of
mechanisms related to scale economies, the real wage in the destination region increases rather than decreases (Kanbur and Rapoport, 2004).

In the recent years regional differences in living standards have increasingly been recognized as having a potentially important link to overall economic development and growth of a country. The World Development Report 2009 of the World Bank titled *Reshaping Economic Geography* (World Bank 2009) argues that spatial disparities increase in the early stages of development, and then diminish as countries reach high income status. Drawing from the development experiences of upper-middle income countries, it argues that different dimensions of well-being converge at different speeds, beginning with essential household consumption and followed by basic public services such as education, health and water and sanitation. Last to converge are wages and incomes.

A central message of the 2009 World Development Report is that “economic growth is seldom balanced, and that efforts to spread it prematurely will jeopardize progress.” Thus, important trade-offs may be associated with the promotion of regional and spatial equity and overall economic efficiency. Specific policies should therefore focus more on facilitating the drivers of growth and less on spatial inequality at any given point in time. At the same time, governments face strong pressure to take action in the short run to redress existing stark regional disparities, rather than expect that they will be resolved in the long run by human capital accumulation and reallocation. This study hopes to shed light on the difficult question of whether and how the Thai government can undertake fiscal policies that help alleviate disparities, while not impeding longer-term equalizing processes.

This paper applies a methodological framework for analyzing welfare disparities between geographic areas in Thailand that can also provide the basis for analyzing and hopefully improving the role of fiscal expenditures in a decentralized environment. The objectives are two-fold. First, investigate the determinants of the observed differences in the standards of living between regions in Thailand at a given point in time. Second, provide empirical evidence on the sources of regional welfare differences useful for informing the policy debate surrounding regional inequalities in Thailand. The following questions are addressed: (i) How does the standard of living vary within and between regions (or even among provinces) in Thailand? (ii) Are the differences in the standard of living between any two geographic areas mainly due to differences in returns to characteristics or difference in the characteristics
themselves? And (iii) To what extent is the current allocation of fiscal expenditures by the central authorities related to the needs of different provinces and to the main determinants of the spatial disparities in welfare?

Using household level data from the 2000 and 2009 Socio-economic Survey (SES) of Thailand, we find that the lower level of welfare in the rural areas within any of the five regions of Thailand, is due primarily because of differences in characteristics of the population living in rural areas. Differences in returns generally account for the most part of the welfare differences between urban areas of different regions and Bangkok or rural areas of other regions compared with the rural North East. Finally, the analysis of fiscal expenditures and its relation to welfare disparities suggests that there are many opportunities to improve the role of fiscal expenditure allocation from the central government as an instrument of addressing the needs of provinces in terms of low returns.

The paper is structured as follows. Section 2 provides a brief summary of the SES, discusses our consumption-based measure of welfare, the welfare ratio, defines the variables used in the analysis and presents the methodology for the decomposition of mean welfare differentials Section 3 presents the results of these decompositions, and Section 4 concludes and discusses some of the implications for policy.

2. Methodology and Data Used

We employ the Oaxaca-Blinder methodology to explore differences in mean welfare in urban and rural areas within and between two geographic areas or regions (Ravallion and Wodon, 1999). The Oaxaca-Blinder decomposition allows us to estimate the relative contributions of differences in household characteristics and returns to these characteristics in accounting for differences in living standards.

Comparing Living Standards within and between Regions

The various determinants of welfare can be classified into two broad groups: (i) a set of “covariates” that summarize the portable or non-geographic attributes of the household, such as age, level of education, demographic composition, denoted by the vector $\mathbf{X}$; and (ii) and a set of structural parameters that summarize the marginal effects or “returns” of these household attributes, denoted by the constant term $\alpha$ and the parameter vector $\beta$. 
Specifically the set of covariates summarized by the vector $X$, consists of variables characterizing the demographic composition of the household: number of infants, teenagers, adults, elderly in household, whether the head of household is married without spouse, single without spouse, married, with spouse; if household head is male, age of household head, and age squared; binary variables identifying the education level of the household head and spouse: primary incomplete; primary complete, low secondary, upper secondary and superior; and binary variables for the main occupation (Plant/machine operators; Elementary occupations and Economically inactive or unknown, Legislator, official and manager; Professional; Technician; Clerk; Service/sale worker; Skilled agricultural worker; Craft and related trade worker); and economic sector of employment (Agriculture, Industry, Services and Others).

Given any two locations A and B, we assume that logarithm of the welfare measure in each region, denoted here by $\ln C$, can be summarized by the linear regression:

\[ \ln C_A = \beta_A X_A + \varepsilon_A, \quad \text{and} \]

\[ \ln C_B = \beta_B X_B + \varepsilon_B \]  

where $\varepsilon$ is a random disturbance term with the usual properties for summarizing the influence of all other factors on the standard of living including individual effort.$^1$

In this specification, the “returns” to characteristics $\beta$ summarize the influence of a variety of factors on the standard of living in different regions. Basic infrastructure, ease of access to markets and other basic services are some of the most important of these factors. In addition, returns to characteristics are also affected by the role of institutions, social customs and other cultural factors that are typically too difficult to quantify.

Based on the specification above, and given that estimated regression lines always cross through the mean values of the sample, the mean difference in the standard of living between regions A and B can then be expressed as:

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$^1$ Agglomeration effects are likely to influence both the $X$'s and the coefficients $\beta$. 
where the bar over the relevant variables denotes the sample mean values of the respective variables, and including the assumption that \( E(\varepsilon_j) = 0 \), for \( i = \{A, B\} \).

After adding and subtracting the term \( \beta_B \bar{X}_A \) we can express the difference above as:

\[
\ln C_A - \ln C_B = \beta_A \bar{X}_A - \beta_B \bar{X}_B - \beta_B \bar{X}_A \rightarrow \\
\ln C_A - \ln C_B = (\bar{X}_A - \bar{X}_B)\beta_B + (\beta_A - \beta_B)\bar{X}_A \
\]

or

\[
\Delta(\ln C) = (\Delta \bar{X})\beta_B + (\Delta \beta)\bar{X}_A
\]  \hspace{1cm} (4)

Alternatively, if one were to add and subtract the term \( \beta_A \bar{X}_B \), the difference in (3) could be expressed as:

\[
\Delta(\ln C) = (\Delta \bar{X})\beta_A + (\Delta \beta)\bar{X}_B
\]  \hspace{1cm} (5)

Both expressions (4) and (5) imply that the differential in the mean welfare ratios between regions A and B can be decomposed into two components: one that consists of the differences in average characteristics summarized by the term \( \Delta \bar{X} \) and another due to the differences in the coefficients or returns to characteristics in different regions summarized by the term \( \Delta \beta \). This is the decomposition method first proposed by Oaxaca (1973) and Blinder (1973).

The decompositions given by expressions (4) and (5) are equally valid. The only difference between them lies in how the differences in the characteristics \( \Delta \bar{X} \) and the differences in coefficients \( \Delta \beta \) are weighted. In expression (4) the differences in the characteristics \( \Delta \bar{X} \) are weighted by the returns of the characteristics in region B, whereas the differences in the returns \( \Delta \beta \) are weighted by the average characteristics of households in region A. In contrast, in expression (5) the differences in the characteristics \( \Delta \bar{X} \) are weighted by the returns of the characteristics.
characteristics in region A, whereas the differences in the returns $\Delta \beta$ are weighted by the average characteristics of households in region B.

Since the original decomposition by Oaxaca, numerous papers have extended the method by proposing alternative weights for the differences in the characteristics $\Delta \bar{x}$ and the differences in returns $\Delta \beta$ (e.g. Reimers, 1983, Cotton, 1988, and Neumark, 1988). We follow Jann (2008) and use a weighted average of the coefficients and a weighted average of the characteristics, as follows:

$$\ln c_A - \ln c_B = (\bar{x}_A - \bar{x}_B)[W\beta_A + (I - W_A)\beta_B] + (\beta_A - \beta_B)[(I - W)\bar{x}_A + WX_B]$$

(6)

where $W$ is a matrix of relative weights given to the coefficients of Group A and I is the identity matrix. This is equivalent to using the coefficients from a pooled model over both groups as the reference coefficients (Jann, 2008).

The use and interpretation of the decomposition method discussed above involves a number of caveats. For a start, these decompositions are simple descriptive tools that provide a useful way of summarizing the role of endowments and returns in explaining existing welfare differentials. For this reason, we refrain from attributing causality to either endowments or returns in the welfare differences between or within regions. Our specification intentionally excludes infrastructure and access to basic services. The influence of infrastructure as well as other omitted variables is captured by default by the estimated coefficients of the portable characteristics of the household. As the formula for omitted variable bias suggests, the estimated coefficients of the household characteristics can be considered to include the direct effect of the omitted variables (such as infrastructure, local institutions and other household variables possible correlated with the location of the household) on welfare and their correlation with the included household characteristics. The decomposition formula in equation (6) holds only at the mean of the two regions being compared. The findings obtained from the decompositions at the mean may or may not hold at other deciles of the distribution of welfare. The decomposition results may be biased because of the presence of selection bias. To the extent

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2 In our study, the decompositions employed are done using the Stata command “Oaxaca” written by Ben Jann (2008).
there is free internal migration within and between different regions, the current place of residence may not be exogenous.

**Decompositions Within and Between Regions**

The bulk of our analysis consists of estimating equations (1) and (2) for the pair of areas or regions. For example, the *within-region* comparisons of the standard of living typically consists of estimating equation (1) based on household data from the urban areas in that region and equation (2) based on household data the rural areas of the same region. *Between region* comparison in the same country involves a number of comparisons, since the comparison could be performed between an urban area in region A and a rural area in region B or an urban area in region B, and so on. To keep the number of comparisons to a manageable level, the comparisons between regions are limited to between the urban areas of the two different regions and between the rural areas of two different regions. Thus, for between-region comparisons of urban areas, equation (1) is estimated for the urban areas of region A and equation (2) is estimated separately for the urban areas of region B. An analogous approach is used in comparing and decomposing the differences in the standard of living between rural areas of region A and B.

Having estimates of equations (1) and (2) for any two areas or regions of interest, we then use the simple decomposition of the differential based on:

\[
\Delta C = \Delta E + \Delta R \tag{7}
\]

Equation (7) simply states that the differential in living standards, \(\Delta C\), can be decomposed into a component due to differences in endowments, \(\Delta E\), and a component due to differences in returns, \(\Delta R\). Equation (7) allows one also estimate the fraction of the differential that is due to differences in endowments, \(\frac{\Delta E}{\Delta C}\), versus differences in returns, \(\frac{\Delta R}{\Delta C}\).

As will become more apparent below, the ratios reported can occasionally be quite large positive or negative numbers. Typically, the fraction of the differential due to differences in endowments, \(\frac{\Delta E}{\Delta C}\), is a positive magnitude, and its size is driven by the size of the numerator relative to the denominator. For example, in explaining differences in the log welfare ratio between urban and rural areas, it is typically the case that the welfare ratio is higher in the
urban areas than the rural areas, i.e., $\Delta C > 0$, and the average value of the vector of characteristics in the urban areas is higher than in rural areas, i.e., $\Delta^E > 0$. In cases where the differences in characteristics are large and the differences in living standards are small, the reported ratio $\Delta^E / \Delta C$ can be well over 100 percent. Given that the sum of the two ratios as to equal to 1 (or 100 percent), in cases where $\Delta^E / \Delta C$ is over 100 percent, the fraction of the differential due to differences in returns $\Delta^R / \Delta C$ is by default a large negative number.

**Data**

The analysis relies on household survey data from the 2000 and 2009 Socioeconomic Survey (SES) of Thailand to provide a diagnostic analysis of the main determinants of spatial differences in welfare within and across regions. The SES is a detailed household survey that is representative at the provincial level containing socio-economic information for approximately 44,000 households and 140,000 individuals (in 2009).

Although welfare has many dimensions, monetary measures of welfare are usually based either on income or consumption. Consumption expenditures available from household surveys are preferable for the purpose of poverty and inequality analysis to other indicators such as household income, for both conceptual and pragmatic reasons. For example, consumption expenditures reflect not only what a household is able to command based on its current income, but also whether that household can access credit markets or household savings at times when current incomes are low or even negative (due perhaps to seasonal variation or a harvest failure). As such, consumption is thought to provide a better picture of a household’s longer run standard of living than a measure of current income. Further, consumption expenditures for the poor are often better captured than household incomes. While poor households are probably purchasing and consuming only a relatively narrow range of goods and services, their total income may derive from multiple different activities with strong seasonal variation and with associated costs that are not always easily assigned.

In Thailand, as in most countries, there is no index constructed specifically for measuring differences in the cost of living across regions. As a consequence, the official measures of inequality in Thailand, as in many other countries in the region and elsewhere, are
measured using nominal income or expenditures without adjusting for cost of living differences across regions.

In this study we adjust household consumption for cost of living differences across regions by dividing the consumption expenditures of a household by the ratio of the region-specific poverty line with the poverty line in Bangkok in 2007. Specifically, poverty lines are estimated for the following nine areas/regions: The greater metropolitan area of Bangkok, and urban and rural areas of the Central, North, Northeast and South, regions.

For consistency with other studies in the field (Ravallion and Wodon, 1999; Skoufias ad Katayama, 2011) the welfare measure used in this section of the report is the welfare ratio. The welfare ratio is the ratio of the household’s expenditure to the contemporaneous poverty line in the region of residence of the household. Specifically,

\[ W_{h(j, r, t)} = \frac{PCE_{j, r, t}}{PL_{r, t}} \]  

where \( W_{(j, r, t)} \) denotes the welfare ratio of household \( j \) in region \( r \), in year \( t \) where \( t = 2000 \) and \( 2009 \), \( PCE_{j, r, t} \) denotes nominal per capita expenditures of household \( j \) in region \( r \), in year \( t \), and \( PL_{r, t} \) is the poverty line in region \( r \) in year \( t \). In calculating the welfare ratio, we use the officially estimated poverty lines for the urban and rural areas of each region and Bangkok in 2000 and in 2009. The welfare ratio as defined is a number that measures the standard of living as a multiple of the poverty line, i.e.

\[ W(j, t, r) \in (0, \infty) = \begin{cases} 0 < W < 1 & \text{below the pov line} \\ W = 1 & \text{equal to the pov line} \\ W > 1 & \text{above the pov line} \end{cases} \]

Poverty lines are typically constructed based on the Cost of Basic Needs (CBN) approach, which is, in essence, a Laspeyres’ price index with fixed quantity weights. Thus, the welfare ratio may also be considered analogous to “real expenditures”.

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\(^3\)The regional poverty lines as a measure of cost of living differences across regions are used mainly for practical reasons. In fact, the poverty line for Thailand varies not only varies across urban and rural areas in each of the regions, but also across households of different size and demographic composition (Jitsuchon, et al, 2006). The poverty lines we use are an average of the household-specific poverty lines in each of the areas/regions.

\(^4\) The welfare ratio and its theoretical properties is discussed by Blackorby and Donaldson (1987). More practical applications of the welfare ratio in the measurement of poverty can be found in Ravallion (1998) and Deaton and Zaidi (2002).
3. Results

Welfare Disparities Within and Between Regions

To address the question of how large are the disparities in welfare within regions of Thailand and how this differential has changed between 2000 and 2009, we compare differences in welfare between urban and rural areas within each of the four regions of Thailand (Bangkok excluded). Along similar lines, to carry out the “between-region” comparisons we first compare differences in welfare in each region (urban & rural areas pooled) against the metropolitan area of Bangkok. Acknowledging that the pooling of urban and rural areas into one regional aggregate may be “mixing apples with oranges” we also construct additional comparisons of urban areas in each region against Bangkok and rural areas in each region against the rural NE.

Figure 2 below, presents the mean differences in welfare ratios within urban and rural areas in each region as well as the mean differences in welfare ratio between regions in 2000 and in 2009. As is well known for the case of in Thailand, and most other countries, urban areas have higher level of welfare than rural areas even after taking into account cost of living differences. The largest differential between urban and rural welfare is in the Northeast region followed by the South region. Compared to that in 2000, in 2009 the gap between urban and rural welfare declined in two regions (Central and South) and increased in other two regions.

[Figure 2 here]

Comparing welfare ratios between regions, not surprisingly, Bangkok has the highest standard of living than any of the regions (panel b in Figure 2) or any of the urban areas of Thailand’s regions.\(^5\) The NE is the poorest region relative to Bangkok in both 2000 and 2009 though the gap seems to have declined somewhat in 2009 (panels b and c in Figure 2). Moreover, the rural areas of the NE appear to have lower welfare ratio than the rural areas of other regions.

Next, we investigate whether it is differences in portable characteristics or differences in returns to characteristics that are the primary determinants of these welfare differences. The

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\(^5\) All these differences are estimated for the log of the welfare ratio.
estimated decompositions of welfare differences between urban and rural areas within regions reveal that characteristics explain a larger share of the welfare differences within regions (see panel a in Figure 3). Differences in household characteristics seem to be the most important factor, explaining more than 70 percent of the welfare differences between urban and rural areas within regions. Thus, it seems that with regions the higher level of welfare in urban areas relative to rural areas is explained by the concentration in urban of individuals with higher level of endowments.

There are two potential explanations as to why differences in characteristics between urban and rural areas of the same region may be so large. First, it could be that the nature of productive activities in urban and rural areas may require inherently different characteristics. Farming activities in the rural areas, for instance, require little formal education and might be carried out more efficiently by households with more family members. However, a lower education level and larger number of family dependents would be less likely to lead to better economic outcomes in an urban setting. A second, complementary possibility is that people sort themselves across space based on their characteristics. That is, individuals migrate between urban and rural areas within regions to the location where they can earn the highest returns for their set of characteristics.

The decomposition of welfare differences “between” regions in Thailand reveals that the answer varies depending on how a region is defined. When a geographic region is defined by combining urban and rural areas within the region, differences in the characteristics of households in the region compared to those in Bangkok continue to be the primary explanation of the differential in standard of the living (see panel b in Figure 3). Thus, the individuals who live in Bangkok have higher level of endowments such as education, which appear to explain the largest part of the differential in well being.

[Figure 3 here]

A different picture emerges when we make more fair comparisons between regions, such as comparing the urban areas of each region against Bangkok and the rural areas of each region against the rural areas in the NE of Thailand. In both of these cases, returns play a much larger role in explaining welfare differentials than they did between urban and rural areas of the
same region (panels c and d in Figure 3). Thus, welfare differences between urban areas and
Bangkok are mostly due to differences in returns rather than due to differences in
characteristics. That is, people living in Bangkok have roughly comparable characteristics to
those of urban dwellers of the other regions, but the latter receive much lower returns for these
characteristics than the former. A notable exception is the case of North in 2009 in panel d of
Figure 3. Differences in welfare between rural areas in the North and rural areas in the NE
appear to be explained for the most part (close to 60 percent) by differences in the characteristics
of the household endowments in these areas.

Models of migration would predict a movement of people until returns in both regions
are equalized and the incentives to migrate vanishes. So how is it possible that the differences in
returns continue to persist over time? There are at least three possible complementary
explanations. First, the analysis presented in this study does not control for the quality of some
of the characteristics analyzed—for instance, education. Although the data do not allow us to
observe differences in quality of education, labor markets do observe these differences—albeit
imperfectly—and assign different returns to the same number of years of education according
to their quality. Hence, if the quality of education in the lagging region is lower than in the
leading region, returns to education will appear to be lower in the former than in the latter
region, even though the return to just the number of years—stripped of quality—is the same.

Two additional underlying reasons preventing the equalization of returns or producing
differences between different locations are the role of migration and the role of agglomeration
effects. In principle, unconstrained and costless migration should facilitate the equalization of
returns as the existence of higher returns in a particular area should draw labor from lower
return areas until returns are equalized. In a Harris-Todaro (1970) model in which migration
decisions are based on expected net benefits, not just wage differentials, the low expected
probability of finding a good job in the city given lower rural education levels may be
decreasing the incentives for rural to urban migration, thereby allowing returns to differ. Also,
others factors such as high migration costs, insufficient land rights, and social segmentation
may be posing barriers to migration.

Another possibility is that positive agglomeration effects are elevating returns in large
metropolitan areas. As described in the New Economic Geography literature, agglomeration
economies are characterized by increasing economies of scale. With well developed
infrastructure, a high degree of market specialization, greater competition, information exchange, and more efficient matching in the labor market, the environment is conducive to lowering costs and producing higher returns (Venables 2005, Krugman 1998). Thus, one could expect metropolitan areas of leading regions to have both high returns – from increasing economies of scale – and a higher concentration of individuals with valuable human capital assets (both observable education and unobservable ability and motivation) as talented workers are attracted to the higher rates of return and wider range of employment opportunities.

Another interesting aspect worthy of consideration in the analysis of welfare differentials is the extent to which the determinants of the welfare differential change substantially over time. The results of the analysis reveal some interesting changes in the primary factors explaining differences in welfare. The explanation for the welfare differences between urban areas and Bangkok in 2009 seems to be more and more due to differences in the returns compared to 2000. For example, in 2000 about 60 percent of the welfare differential between urban areas in the NE and Bangkok could be attributed to differences in characteristics (with the remaining 40 percent attributed to differences in returns). By 2009, differences in characteristics seem to play a smaller role (just over 40 percent) in explaining welfare differences, while differences in returns seem to become more important (just fewer than 60 percent). The increased explanatory role of differences in the returns in 2009 also appears to hold in the comparisons of welfare differences between Bangkok and urban areas of other regions.

Thus, differences in household characteristics are the main correlate of welfare disparities between urban and rural areas within each region of Thailand (both in 2009 and in 2000). This suggests that mobility between urban and rural areas within any given region manages to equalize returns to characteristics. Differences in characteristics continue to be the main explanation of welfare disparities between Bangkok and other regions of Thailand (both in 2009 and in 2000). However, when we compare welfare differences between urban areas and Bangkok or between rural areas and rural NE, we find that differences in the returns are the main correlate of welfare disparities among regions. These results are in sharp contrast with results in Latin American countries where differences in the characteristics are the main correlates of welfare differences. They suggest the presence of agglomeration economies in
Welfare Differences Among Provinces

Provinces are the smallest geographic areas at which the analysis of welfare differences can be carried out in Thailand while maintaining a connection with the administrative division of responsibilities and budgets. It is also the case that the Thailand Socioeconomic Survey is representative at the province level.

The large number of provinces makes one-on-one comparisons too cumbersome. To determine the main explanatory factors of these welfare differences among provinces in each year we investigate the correlation between the actual (average) welfare ratio and two simulated welfare profiles: A returns (or geographic profile) which is the simulated welfare ratio holding characteristics at the province level constant (and allowing returns to differ across provinces); and (ii) a characteristics (or concentration profile) which is the simulated welfare ratio holding “returns” at the province level constant (and allowing characteristics to differ across provinces). Specifically, it consists of the following steps:

1. Estimate welfare ratio profile across 76 provinces of Thailand by estimating a separate regression for each province, i.e.,

\[
\ln C = \alpha_p + \beta_p X^p + \varepsilon^p
\]

where \( X^p \) denotes the characteristics of households in province \( p \). The estimated coefficients (\( \alpha \) and \( \beta \)) are province-specific.

2. Derive simulated welfare ratio for each province by “holding constant” household characteristics at the national average, denoted by \( X^{\text{N}} \), and allowing returns to vary by province, as estimated in the step 1 above, (returns effect) i.e.

\[\text{returns effect}\]

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\[\text{characteristics (or concentration profile)}\]

---

\[\text{returns (or geographic profile)}\]

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6 The methodology is a variation of that in Ravallion and Wodon (1988).
(3) Derive simulated welfare ratio for each province by “holding constant” returns as the national average and allowing characteristics to vary by province, *characteristics effect*

\[
\ln C = \alpha^p + \beta^p X^N + \varepsilon^p
\]

(10)

\[
\ln C = \alpha^N + \beta^N X^p + \varepsilon^N
\]

(11)

where \(X^p\) represents the sample mean characteristics of households by province and the parameters are calculated as population-weighted means:

\[
\alpha^N = \sum_{i=1}^{p} \alpha^i s^i
\]

\[
\beta^N = \sum_{i=1}^{p} \beta^i s^i
\]

(12)

where \(s^i\) denotes the population of each province as a share of the total population the country. With the three different profiles in hand, one may then examine the correlation between the welfare profiles simulated in Steps 2 and 3, with the actual welfare profile in step 1.7

Figure 4 below present the average welfare profile of each province in each of the four regions of Thailand as well as Bangkok in 2009. Within each region welfare in each province is graphed in a decreasing order. Figure 4 highlights that the welfare varies significantly among provinces within a region. Moreover, the mean level of welfare in some provinces exceeds the level of welfare in the metropolitan Bangkok region.

[Figure 4 here]

7 Alternatively, we can compare the fraction of the total variance of actual welfare profile explained by the variance of the returns or endowments profiles.
Figure 5 below displays the R-squared ($R^2$) correlation coefficients obtained from a simple regression of the actual welfare level in each province with the simulated welfare profiles in 2009 and in 2000. The analysis reveals the simulated returns or geographic profile has a stronger correlation with the actual welfare profile in both years. In fact, the correlation is slightly higher in 2009 compared to 2000.

[Figure 5 here]

These findings are in agreement with the earlier findings of the analysis at the regional level.

Province Needs and Fiscal Expenditures

Having established that the welfare differential among provinces of Thailand can be attributed primarily to differences in the returns to household characteristics among provinces (as opposed to differences in the characteristics themselves), in this section we examine whether the expenditures allocated to provinces for different purposes have any relationship with provincial needs as well as whether they can be said to have an effect on returns.

The expenditure data were obtained from the Comptroller General’s Department (CGD) (or Government Fiscal Management Information System). These data contain the actual expenditure allocated by the central government to each province during 2009. Specifically, we restrict our analysis to the actual investment expenditure by province.

The two main categories of Investment expenditure that we consider relevant to our analysis are as follows: a) Community and Social Services (which consists of education, public health and others (social security and welfare, housing and community and religious, cultural and recreation) and b) Economic Services (which consists of (i) fuel and energy, (ii) agriculture, forestry, fisheries, mining and mineral resources, (iii) manufacturing and construction, (iv) transportation and communication, and (v) other economic affairs.

The first question we address is whether there is a “needs-based” allocation of provincial investment expenditures. Though “need” can be defined in many different ways, we focus our analysis on two concrete but quite different definitions of need: (i) the mean welfare ratio of the province in 2000; and (ii) the returns to being employed in a given sector.
If investment expenditures were allocated based on need (however defined) one would expect a significantly negative correlation between expenditures and needs, i.e. a higher allocation of fiscal expenditures to provinces with a lower welfare ratio (more needs) or a lower return to being employed in the industrial or service sector.

One major advantage derived from the extension of the Blinder-Oaxaca method at the province level, is that with a sufficient number of provinces one can carry out a deeper analysis of the relationship between fiscal policy and infrastructure and “returns”. The province-specific estimates of the coefficients of any given variable in the vector $\mathbf{X}$, estimated in equation (9) above, in fact reflect the influence of a variety of factors such as institutions, province-level expenditures on different sectors, and access to infrastructure. One way of investigating the distinct role of some of these factors on the returns to characteristics is to use a variant of the method first employed by Card and Krueger (1992).

For example, suppose there is interest in investigating whether and how the returns to secondary education (which vary by province) correlate with the transfers for investment expenditures for infrastructure from the central government to the province. Let $\widehat{\beta_j^p}$ denote the estimate (specific to province $p$) of the coefficient of whether the household head has secondary education or not. The pooled coefficients for all 76 provinces of Thailand, representing the “marginal welfare returns to having to secondary education” in each province, may then be used as a dependent variable in a regression against the level (current or lagged) or the changes in fiscal transfers received by the province (denoted by $\Delta T^p$) as well as other province-specific variables denoted by $Z^p$, such as the percent of households in each province with access to infrastructure and basic services (electricity, water and sanitation, etc.). For example, the regression of returns against the changes in transfers over the recent years may be expressed as:

$$
\begin{pmatrix}
\widehat{\beta}_1^p \\
\widehat{\beta}_2^p \\
\vdots \\
\widehat{\beta}_6^p
\end{pmatrix} = \alpha + \gamma
\begin{pmatrix}
\Delta T_1^p \\
\Delta T_2^p \\
\vdots \\
\Delta T_6^p
\end{pmatrix} + \delta
\begin{pmatrix}
Z_1^p \\
Z_2^p \\
\vdots \\
Z_6^p
\end{pmatrix}
$$

(14)
In this specification, the coefficient $\gamma$ provides an estimate of the partial correlation between the change in fiscal transfers to the province for and the “marginal welfare return to secondary education”.

Table 1 below reports the regression results obtained by regressing the mean welfare ratio of each province in 2000 (i.e. $lnC(\lfloor 2000 \rfloor)^P$) against the annual growth rate of different components of per capita investment expenditures between 2006 and 2009 from the central government to each province. The components include, Total Social Services, (and each one of its components Education, Public Health, and Others entered separately), and Economic Services.

[Table 1 here]

The regression estimates in Table 1 reveal that there is a negative correlation between the different components of investment expenditures and province needs defined by the mean level welfare ratio. However, this correlation is low and significantly different from zero only for Economic Services and Other expenditures. Thus, it appears that the allocation of expenditures at the provincial level, is based on need, whereby need is defined by the level of welfare. Provinces with lower level of welfare seem to have higher expenditures on Economic Services and Other Services which include Social Security and Welfare.

Table 2 below reports the regression results obtained by regressing the return (or marginal welfare gains) to being employed in a given sector in a province in 2000 against the change of different components of per capita investment expenditures between 2006 and 2009. The categories of investment expenditures used as explanatory variables include Economic Services, Manufacturing, Transport and Communication, and Other.

[Table 2 here]

The estimates in table 2 reveal that there is a positive and statistically significant correlation between expenditures in Economic Services per capita and “returns” to being employed in a specific sector. If investment expenditures were allocated based on need we would expect significantly negative correlation between expenditures and needs, i.e. a higher
allocation of fiscal expenditures to provinces with a lower returns to being employed in the industrial or service sector.

In combination, the results obtained so far reveal that the allocation of investment expenditures to provinces seems to be driven mainly by the intention to equalize the level of welfare among provinces and not directed towards equalizing the differences in the returns among provinces. Provinces with lower level of welfare seem to have higher expenditures on Economic Services and on the other hand, higher fiscal investment expenditures seem to be allocated to provinces that already have a higher return to being employed in the industrial or service sector.

Policy efforts to equalize the differences in the standard of living (or welfare) between regions are likely to be misplaced, since individual outcomes depend not only on individual endowments (or characteristics) and returns to endowments but on individual effort as well. A more practical basis for policy design would be to focus on interventions that aim to equalize opportunities for welfare, rather than equalizing welfare itself (Arneson, 1989; Paes de Barros et al. 2009).

The analysis in carried out in this section suggests that Thai authorities may want to review the objectives of fiscal transfers to the provinces and consider an allocation of investment expenditures directed towards districts where returns to characteristics are lower.

The analysis so far related recent (2006 and 2009) investment expenditures with pre-existing needs. Another question that can be posed is whether fiscal expenditures and their allocation have any effect on the level of welfare or on the returns to key characteristics. We investigate the presence of such potentially causal effects in two ways. First, we examine at whether the annual growth rate changes in provincial welfare are correlated with changes in the provincial per capita investment expenditures; and second, whether earlier (2006) provincial investment expenditures have an effect on the current (2009) marginal welfare gains to being employed in a given sector.

Table 3 presents the estimates from regressing the province-specific annual growth rate in the welfare ratio (between 2009 and 2000) to the province-specific annual growth rate of total investment expenditure per capita (between 2009 and 2006)

[Table 3 here]
The positive coefficient for total investment expenditures suggests some impact on welfare that can be attributed to the provincial per capita investment expenditures. However, the absence of any statistically significance prevents us from drawing more definite conclusions.

In the same spirit, Table 4 present the estimates from regressing the current (2009) returns or marginal welfare gains to being employed in industry, services or other sectors on 2006 provincial investment expenditures.

[Table 4 here]

Our earlier analysis revealed that differences in the returns between provinces are the primary explanatory factor for the differences in welfare across provinces. A positive and significant coefficient for investment expenditures on Economic Services in 2006 or its different components in 2006 would suggest that investment expenditures have a positive impact on the returns to welfare. As the estimates in Table 4 reveal, there is a positive correlation between actual “returns” in being employed in any given sector and investment expenditure in previous years. However, as before, the absence of any statistically significance prevents us from drawing stronger conclusions.

4. Concluding Remarks and Policy Considerations

In this article we investigated (i) the extent to which the differences in the standard of living between regions in Thailand is due to differences in the returns to characteristics or differences in the characteristics themselves; and (ii) whether the current allocation of fiscal expenditures by the central authorities is related to the main determinants of the spatial disparities in welfare among provinces.

At the regional level two major results stand out. First, within any given region, rural areas tend to be worse off than the urban areas of the same region. This is due primarily because of differences in characteristics. Second, differences in returns generally account for the most part of the welfare differences between urban areas of different regions and Bangkok or rural areas of other regions compared with the rural North East.
These findings suggest that a different set of policies may be appropriate for addressing welfare inequalities within regions and between regions. The finding that characteristics play a major role in explaining welfare differences within regions suggest that Thai authorities may want to consider investing in programs to increase the portable human capital endowments of poor people, who can then make their own choice of whether or not to migrate in search of better opportunities. Cash transfer programs targeted to poor households conditional on children attending school regularly and visiting health centers on a regular basis are good examples of programs trying to level the playing field. The effective implementation of these types of programs also entails an increased role for decentralized decision making especially in the targeting of program beneficiaries. However, programs focusing on increasing access and utilization of more schooling and health services are only part of the greater package of programs required to increase the equality of opportunities for welfare. It is also important to increase the quality of the educational and health services provided. In addition, complementary investments increasing access to basic public services such as electricity, water and sanitation are also essential for people to have the opportunity to succeed economically regardless of their place of birth.

The finding that differences in returns between regions account for most of the welfare differences between regions, also suggest that the free migration of labor may not be sufficient for equalizing returns across regions. Further research is needed on whether there are serious costs associated with the migration of labor towards areas of economic opportunity. Related questions are whether investments in spatially connective infrastructure (such as roads that facilitate the movement of goods, services and people across regions) and/or more efficient markets such as that for land, labor, credit, and insurance are necessary conditions for the migration of labor to equalize returns across regions.

The analysis of fiscal expenditures and provincial "needs" reveals that the allocation of investment expenditures to provinces is more consistent with the objective of equalizing the level of welfare among provinces and not with increasing the returns in provinces where they are lower. Policy efforts to equalize the differences in the standard of living (or welfare) between regions may have political pay-offs in the short run, but do not contribute significantly to the conditions for long-run growth of the lagging provinces or regions, since individual welfare depends not only on individual endowments (or characteristics) or returns to
endowments but on individual effort as well. A more practical basis for policy design would be to focus on interventions that aim to *equalize opportunities for welfare*, rather than equalizing welfare itself (Arneson, 1989; Paes de Barros et al. 2009).

Thus Thai authorities may want to consider re-allocating of investment expenditures towards districts where returns to characteristics are lower. The analysis of fiscal expenditures and its relation to welfare disparities suggests that there are many opportunities to improve the role of fiscal expenditure allocation from the central government as an instrument of addressing the needs of provinces in terms of low returns.

Overall, these policy recommendations are quite consistent with those advocated by the World Development Report 2009. Investing in people and removing the barriers they face in taking advantage of economic opportunities anywhere seems more promising than trying to generate such opportunities in places whose economic potential is unknown, difficult to measure, and may be limited. Investing in people means providing them with basic services and living conditions, regardless of their place of birth. This means equality of opportunity. To the extent that these basic services and living conditions vary across space, investing in people may inevitably boil down to making larger investments in certain areas than others. However, such investments seem more promising if they are ultimately focused on the individual—as with conditional-cash-transfer programs—and on resolving market failures, rather than on generating special spatially-linked economic incentives.
References


Figure 1: Region Poverty and Inequality Trends in Thailand

(a) Regional Poverty Trends

(b) Regional Inequality Trend

Source: National Economic and Social Development Board - NESDB (2010)
Figure 2

a. Welfare Differences within Regions Urban vs. Rural areas (Bangkok excluded)

b. Welfare Differences between Regions Region vs. Bangkok

c. Welfare Differences between Regions Urban areas in Region vs. Bangkok

d. Welfare Differences between Regions Rural areas in Region vs. Rural NE

Source: Own estimations based on SES 2000 and 2009
Figure 3

a. Explaining Welfare Differences within Regions: Urban vs. Rural areas (Bangkok excluded)

b. Explaining Welfare Differences between Regions: Region vs. Bangkok

c. Explaining Welfare Differences between Regions: Urban areas in Region vs. Bangkok

d. Explaining Welfare Differences between Regions: Rural areas in Region vs. Rural NE

Source: Own estimations based on SES 2000 and 2009
Figure 4: Welfare Differences Among Provinces in 2009

Source: Own estimation based on SES 2009
Figure 5

(a) Correlation between Actual and Simulated (log) Welfare Ratios in 2009

Source: Own estimation based on SES 2000 and 2009

(b) Correlation between Actual and Simulated (log) Welfare Ratios in 2000
### Table 1: Province Investment Expenditures vs. Needs in terms of welfare

<table>
<thead>
<tr>
<th></th>
<th>Welfare Ratio 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Δ Total Social Services</td>
<td>-0.00351</td>
</tr>
<tr>
<td></td>
<td>(0.00287)</td>
</tr>
<tr>
<td>Δ Education</td>
<td>-0.000786</td>
</tr>
<tr>
<td></td>
<td>(0.00286)</td>
</tr>
<tr>
<td>Δ Public Health</td>
<td>-0.000701</td>
</tr>
<tr>
<td></td>
<td>(0.000641)</td>
</tr>
<tr>
<td>Δ Others (*)</td>
<td>-0.00388***</td>
</tr>
<tr>
<td></td>
<td>(0.00110)</td>
</tr>
<tr>
<td>Δ Economic Services</td>
<td>2.423***</td>
</tr>
<tr>
<td></td>
<td>(0.166)</td>
</tr>
<tr>
<td>Constant</td>
<td>2.693***</td>
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<tr>
<td></td>
<td>(0.148)</td>
</tr>
<tr>
<td>Observations</td>
<td>76</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.020</td>
</tr>
<tr>
<td></td>
<td>0.001</td>
</tr>
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<td></td>
<td>0.017</td>
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</tbody>
</table>

Each independent variable is the annual growth rate of investment in each expenditure function from the Central Government to each province.

(* ) Others = sum of Social Security and Welfare, Housing and Community and Religious, Cultural and Recreation

Source: Own estimations based on GSD 2006-2009 and SES 2000
Table 2: Province Investment Expenditures vs. Needs (in terms of returns)

<table>
<thead>
<tr>
<th></th>
<th>Coefficient Industry 2000</th>
<th>Coefficient Services 2000</th>
<th>Coefficient Others 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>∆ Economic Services</td>
<td>0.00807*** (0.00289)</td>
<td>0.00487* (0.00267)</td>
<td>0.00679** (0.00311)</td>
</tr>
<tr>
<td>∆ Manufacturing</td>
<td>0.000176 (0.000286)</td>
<td>0.000124 (0.000290)</td>
<td>0.00109 (0.000259)</td>
</tr>
<tr>
<td>∆ Transport &amp; Comm</td>
<td>0.00356 (0.00232)</td>
<td>0.00314 (0.00201)</td>
<td>0.00279 (0.00206)</td>
</tr>
<tr>
<td>∆ Others (*)</td>
<td>-0.00166 (0.00193)</td>
<td>-0.00220 (0.00172)</td>
<td>-0.00188 (0.00200)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.170*** (0.0337)</td>
<td>0.139*** (0.0479)</td>
<td>0.0145 (0.133)</td>
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</tbody>
</table>

Each independent variable is the annual growth rate of investment in each expenditure function from the Central Government to each province (2009 vs 2006)

(*) Others = other economic affairs
Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Own estimations based on GSD 2006-2009 and SES 2000
<table>
<thead>
<tr>
<th></th>
<th>Δ Welfare Ratio</th>
</tr>
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<tr>
<td>Δ TOTAL Investment</td>
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<td></td>
<td>(0.0250)</td>
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<tr>
<td>Constant</td>
<td>2.517***</td>
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<td>R-squared</td>
<td>0.025</td>
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Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Own estimations based on GSD 2006-2009 and SES 2000
Table 4: Investment Expenditure and Returns to Employment in Different Sectors

<table>
<thead>
<tr>
<th></th>
<th>Coefficient Industry 2009</th>
<th>Coefficient Services 2009</th>
<th>Coefficient Others 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Economic Services 06</td>
<td>2.08e-05</td>
<td>1.06e-05</td>
<td>1.53e-05</td>
</tr>
<tr>
<td></td>
<td>(2.95e-05)</td>
<td>(2.81e-05)</td>
<td>(3.01e-05)</td>
</tr>
<tr>
<td>Manufacturing 06</td>
<td>0.00129</td>
<td>0.000802</td>
<td>0.000503</td>
</tr>
<tr>
<td></td>
<td>(0.00183)</td>
<td>(0.00196)</td>
<td>(0.00188)</td>
</tr>
<tr>
<td>Transport &amp; Comm 06</td>
<td>1.75e-05</td>
<td>-1.69e-05</td>
<td>-2.16e-05</td>
</tr>
<tr>
<td></td>
<td>(5.07e-05)</td>
<td>(4.5e-05)</td>
<td>(4.85e-05)</td>
</tr>
<tr>
<td>Others 06 (*)</td>
<td>5.33e-05</td>
<td>1.65e-05</td>
<td>3.55e-05</td>
</tr>
<tr>
<td></td>
<td>(6.26e-05)</td>
<td>(6.00e-05)</td>
<td>(6.17e-05)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.0398</td>
<td>0.0659**</td>
<td>0.135**</td>
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<tr>
<td></td>
<td>(0.0536)</td>
<td>(0.0254)</td>
<td>(0.0478)</td>
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<td>Observations</td>
<td>76</td>
<td>74</td>
<td>74</td>
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<td>R-squared</td>
<td>0.007</td>
<td>0.007</td>
<td>0.019</td>
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</table>

Each independent variable refers to the level of investment in each expenditure function from the Central Government to each province in 2006

(*) Others = other economic affairs

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Own estimations based on GSD 2006-2009 and SES 2000