

Onward and upward, they go? A look into the effects of parental human capital on sons' and daughters' schooling outcomes

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Motivations (1)

- **Intergenerational priorities.** It has always been known that the state of educational attainment of children, relative to what their parents have achieved, acts as a useful indicator of mobility along the social status ladder. **To what extent is this appreciated?**
- **Gender Gap Reversal.** Current global and local trends in education show that boys have consistently underperformed in the academic front. **Should we still worry about it?**

Motivations (2)

- **Measurement & heterogeneity.** We replicated established methodology to polish understanding of heterogeneity and appreciate statistical data constraints. Could we still generate meaningful evidence?
- **Policy continuity.** Social mobility requires focus on long – run. What about short term policies?

Paper's objectives

- *First*, due to the importance of education, understanding **how parental educational attainment has affected children's educational outcomes** may provide useful policy prescriptions pertaining to the target and timing of interventions, structure of programs, and other educational initiatives.
- *Second*, the paper extends the analysis by providing a **regional perspective on the gender dimension of educational mobility**.
- *Third*, this paper demonstrates the feasibility of using the **Census of Population and Housing (CPH)** to generate and analyze data on **parent-offspring pairs (father – daughter, father – son, mother – daughter, mother – son)**.

Key questions

- **On the effects of paternal and maternal education on sons' and daughters' educational attainment**
 - How do we empirically characterize educational mobility in the Philippines?
 - Are daughters more educationally mobile relative to their parents? What about sons?
 - Do we observe robust regional patterns across cohorts?
- **On schooling progression of children: Delayed, on – time, or advance?**
 - What are the respective impacts of paternal and maternal education on schooling progression?
 - How will the mother's employment status affect progression outcomes?
 - Do we observe robust regional patterns?

Literature support

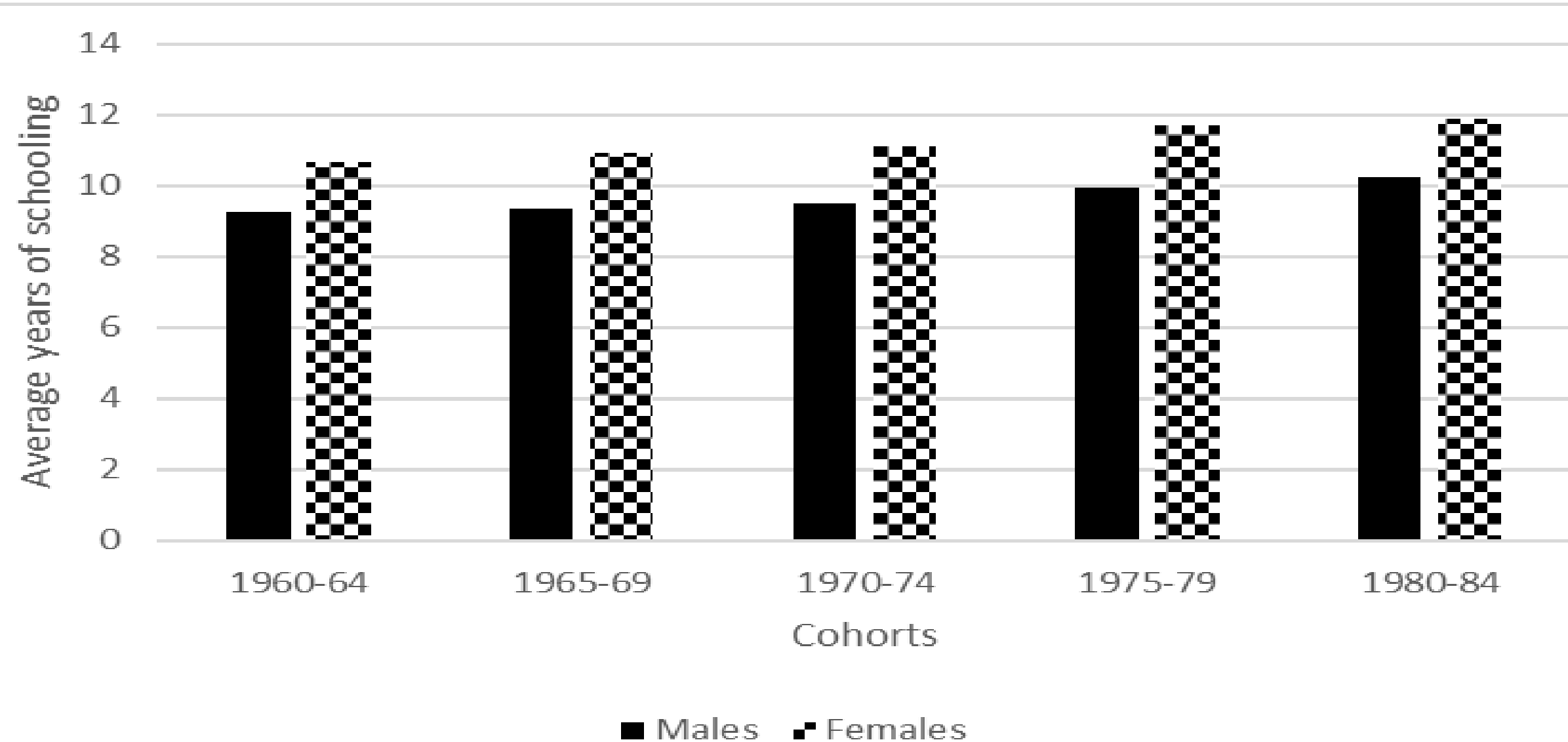
- Several studies that have provided ample characterization come from empirical studies that sought to measure, decompose, and explain intergenerational income elasticity (IGE) using local – based datasets.
- **Bevis & Barrett (2015)** established pathways through which parental human and physical capital affect the incomes of children.
- The relative educational advantage of females has been documented in **Yamauchi & Tiongco (2013)**, **Yamauchi & Liu (2017)**, and **Estudillo et al (2001)**.
- **Lanzona (1998)** focused on intergenerational educational elasticity (IEE) estimated the IEE using the Bicol River Basin Dataset, which consists of rural–based households.

Trends

Narayan et al (2018) document the following global trends:

- Girls in **high-income economies** exhibit higher rates of tertiary education, a trend that is also observed in the **developing world**.
- In **absolute terms**, intergenerational education mobility is higher for girls than for boys.
- In **relative terms**, daughters with highly educated parents are more likely than sons to be in the top quartile in educational attainment.

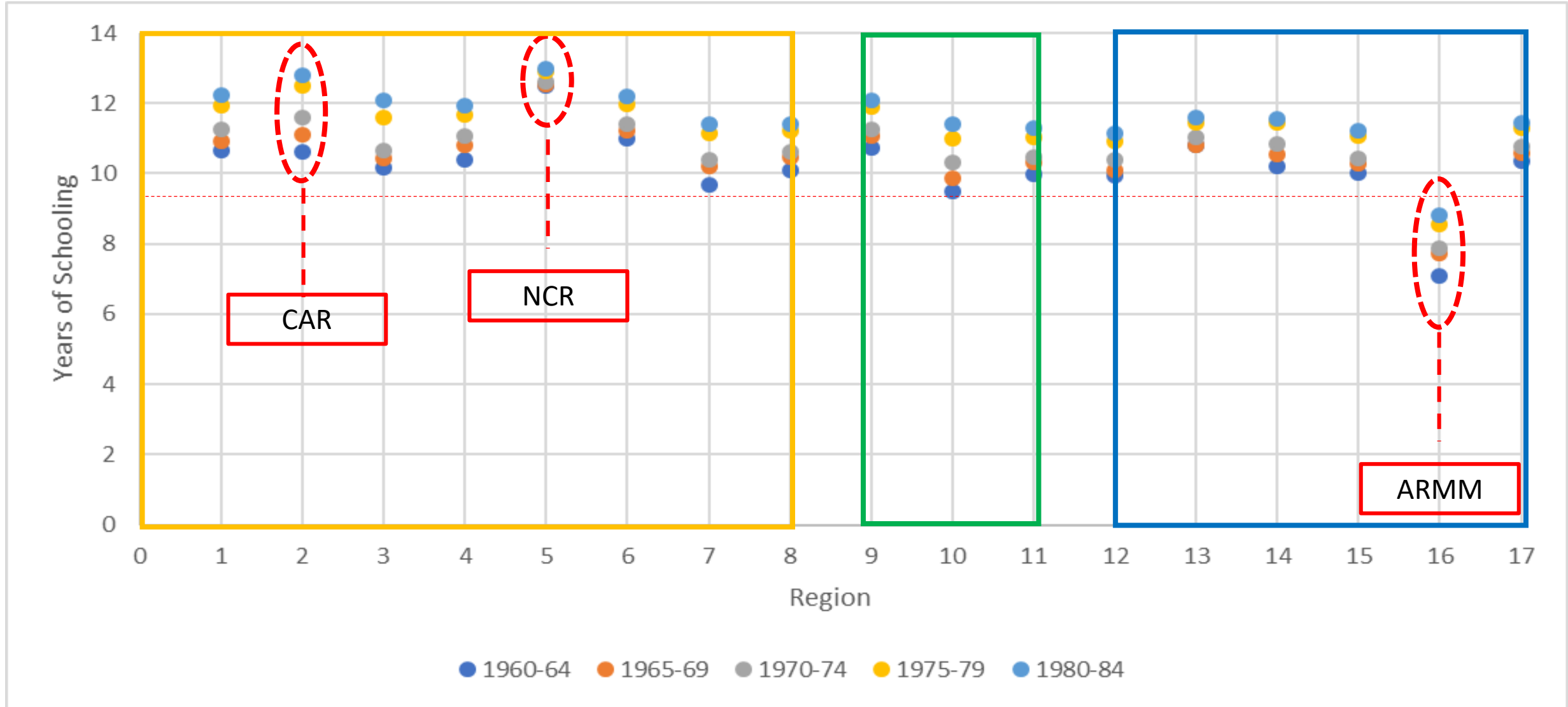
Average Educational Attainment, by sex of offspring



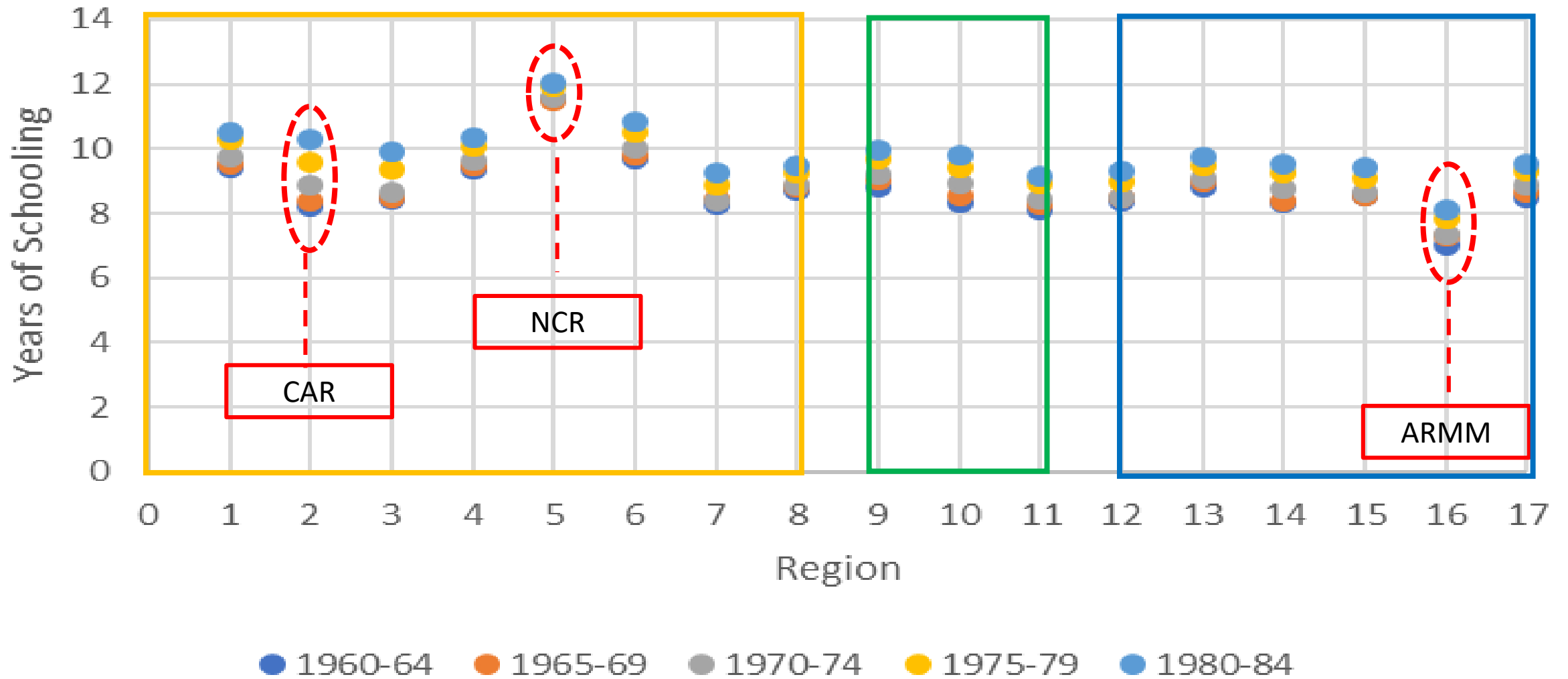
Growth rates of Real Regional Gross Domestic Product (2007 - 2010)

REGION / YEAR		2007-2008	2008-2009	2009-2010	2010-2011
PHILIPPINES		3.7	1.1	7.6	3.9
NCR	METRO MANILA	4.7	-0.4	7.6	3.5
CAR	CORDILLERA	1.7	2	6.3	2.1
I	ILOCOS	2	-1	7.1	3
II	CAGAYAN VALLEY	1.7	1.9	-1.1	5.4
III	CENTRAL LUZON	3.7	-1.4	10.7	7.5
IVA	CALABARZON	1.9	-1.6	11.1	2.6
IVB	MIMAROPA	3	0.8	1.1	2.5
V	BICOL	4.1	8.2	5.2	2.6
VI	WESTERN VISAYAS	4.3	5.9	3.7	5.5
VII	CENTRAL VISAYAS	3.3	0.8	12.5	7.9
VIII	EASTERN VISAYAS	3.4	1.8	2	1.8
IX	ZAMBOANGA PENINSULA	2	6.8	3.6	0.1
X	NORTHERN MINDANAO	5.2	2.9	6.9	2.5
XI	DAVAO REGION	3.7	5.4	5	4.1
XII	SOCCSKSARGEN	4.5	1.3	2	4
XIII	CARAGA	2.7	2.7	7.4	9.6
ARMM	MUSLIM MINDANAO	1.6	2.6	2.3	-1

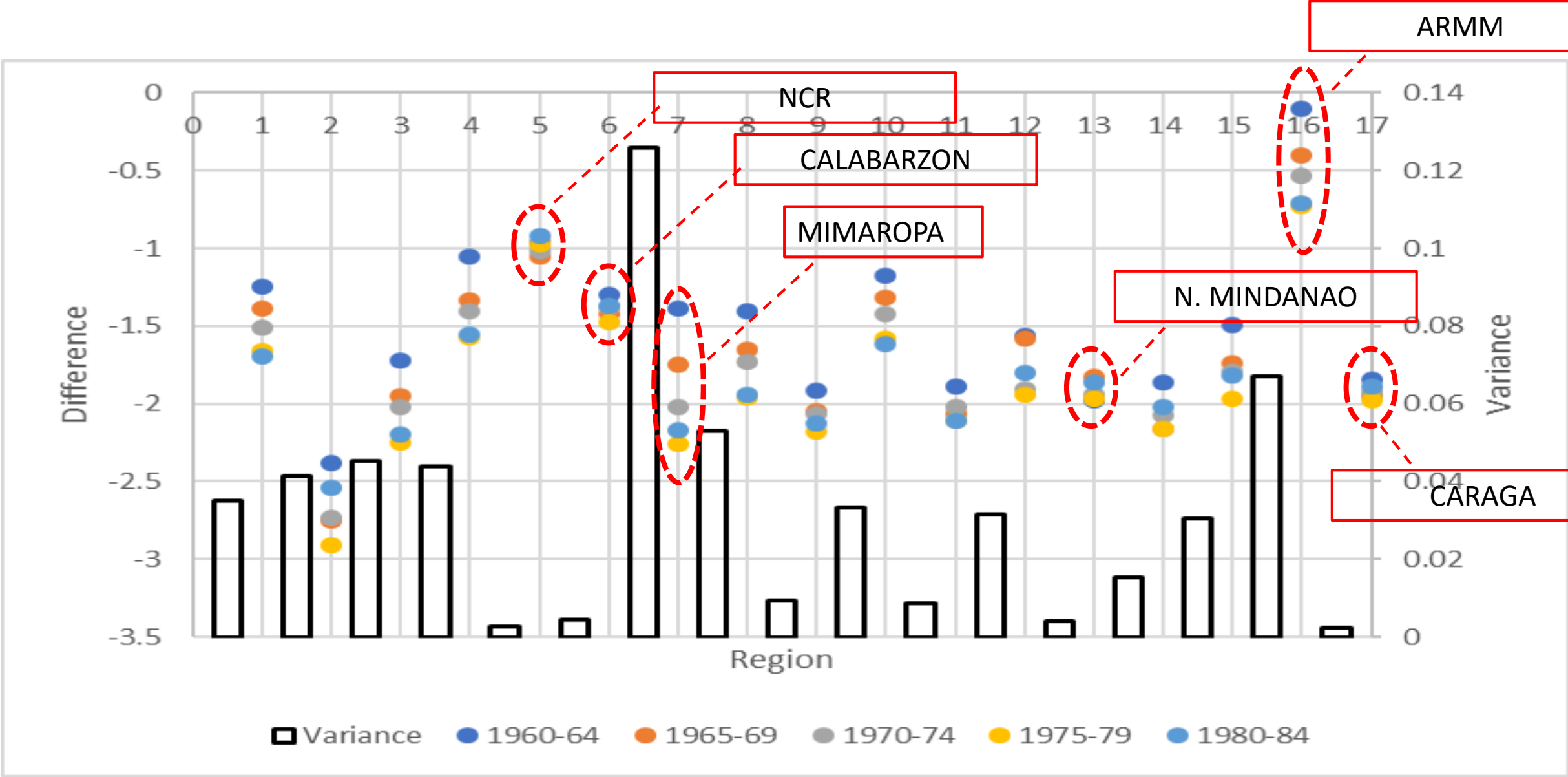
Mean educational attainment of daughters (in years)



Mean educational attainment of sons (in years)



Differences between sons' and daughters' mean educational attainment (in years)



Measuring offspring's educational mobility and parental education: The Linear Model

- **Two fundamental equations**

- $s_{i,h}^c = f(s_{i,h}^p; \beta) + \epsilon_{i,h}^c$
- $s_{i,h}^c = f(s_{i,h}^p; \beta) + x_{i,h}^p' \delta_i + x_{i,h}^c' \eta_i + \epsilon_{i,h}^c$

- **Variables**

- Following Lanza (1998), the paper includes the respective **ages and educational achievements (in schooling years) of fathers and mothers**.
- The paper also controls for other variables that may affect the child's educational outcomes, such as the **number of children, extended household indicator, household size, the presence of an overseas Filipino worker household head**.
- For this empirical exercise, the sample is limited to working-age offspring, or those **aged 25 and above**.

The intergenerational education elasticity (IEE)

- The IEE is a correlation measure.
- A high value (or close to 1) implies high persistence.
- A low value (or close to 0) implies low persistence.

Mobility estimates

- Summary table
- Mobility maps

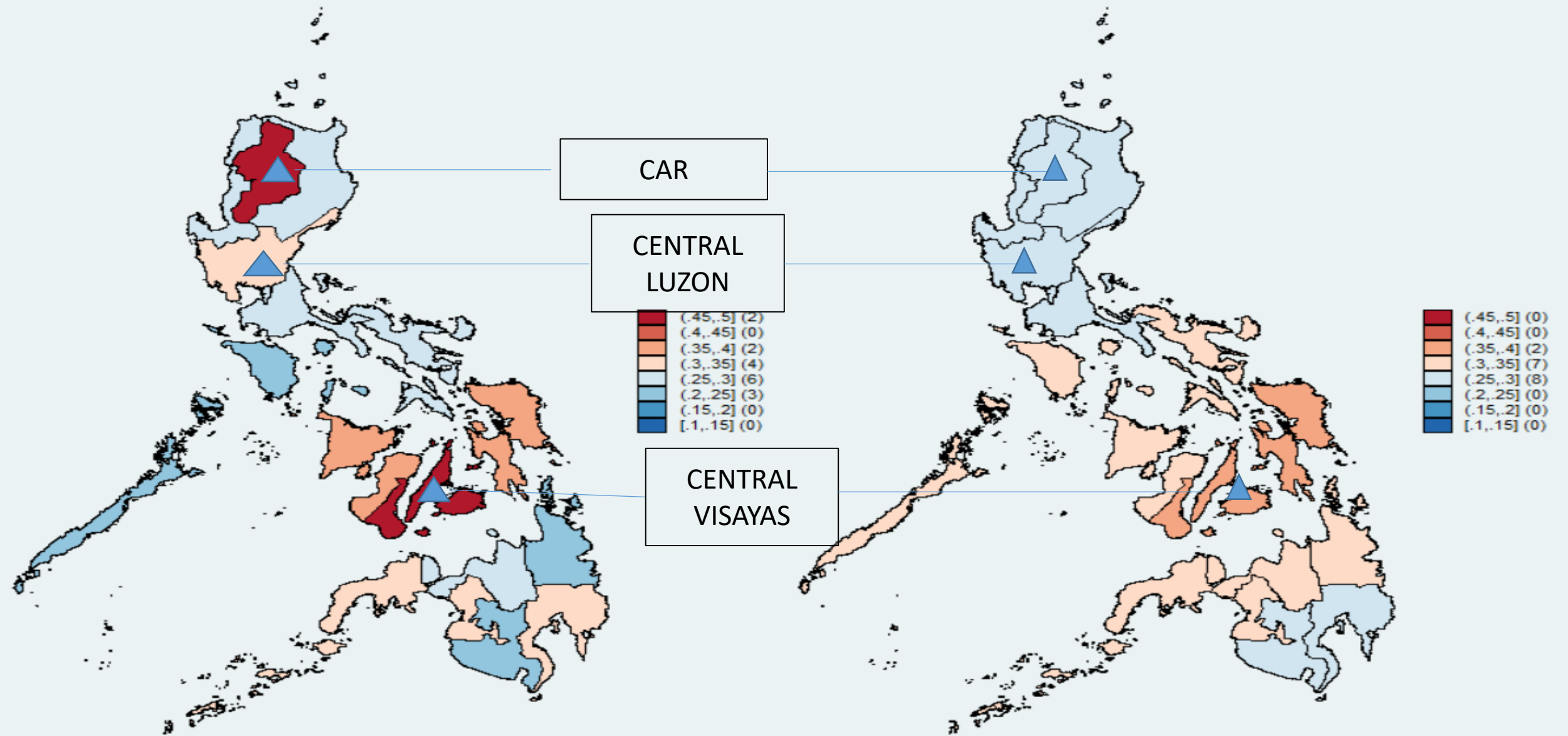
Table 2: Summary of results presented in tables 2A and 3A

Panel A (summary of results in table 2A): IIE for parent-offspring pair

	FATHER-SON	MOTHER-SON
Higher IIE: became less mobile	NCR, Northern Mindanao, and Davao MIMAROPA, Bicol	<u>Ilocos</u> , Cagayan Valley, Central Luzon, CALABARZON, Zamboanga Peninsula, Eastern Visayas, and ARMM
Lower IIE: became more mobile	Eastern Visayas, SOCCSKSARGEN, and ARMM	Bicol, and Western Visayas, Central Visayas, Davao, NCR, CAR, and MIMAROPA
Remain the same	Rest of the regions	Rest of the regions
	FATHER-DAUGHTER	MOTHER-DAUGHTER
Higher IIE: became less mobile	Zamboanga Peninsula and Northern Mindanao	Northern Mindanao
Lower IIE: became more mobile	Rest of the regions; MIMAROPA and CAR, Cagayan Valley and Bicol	Rest of the regions; Zamboanga Peninsula

1960-64 Cohort

1980-84 Cohort



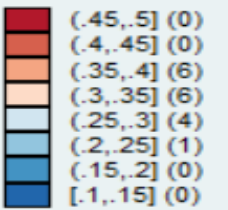
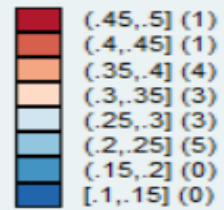
Cohort - based IEE estimates: Father - son pairs

1960-64 Cohort

1980-84 Cohort

CAR

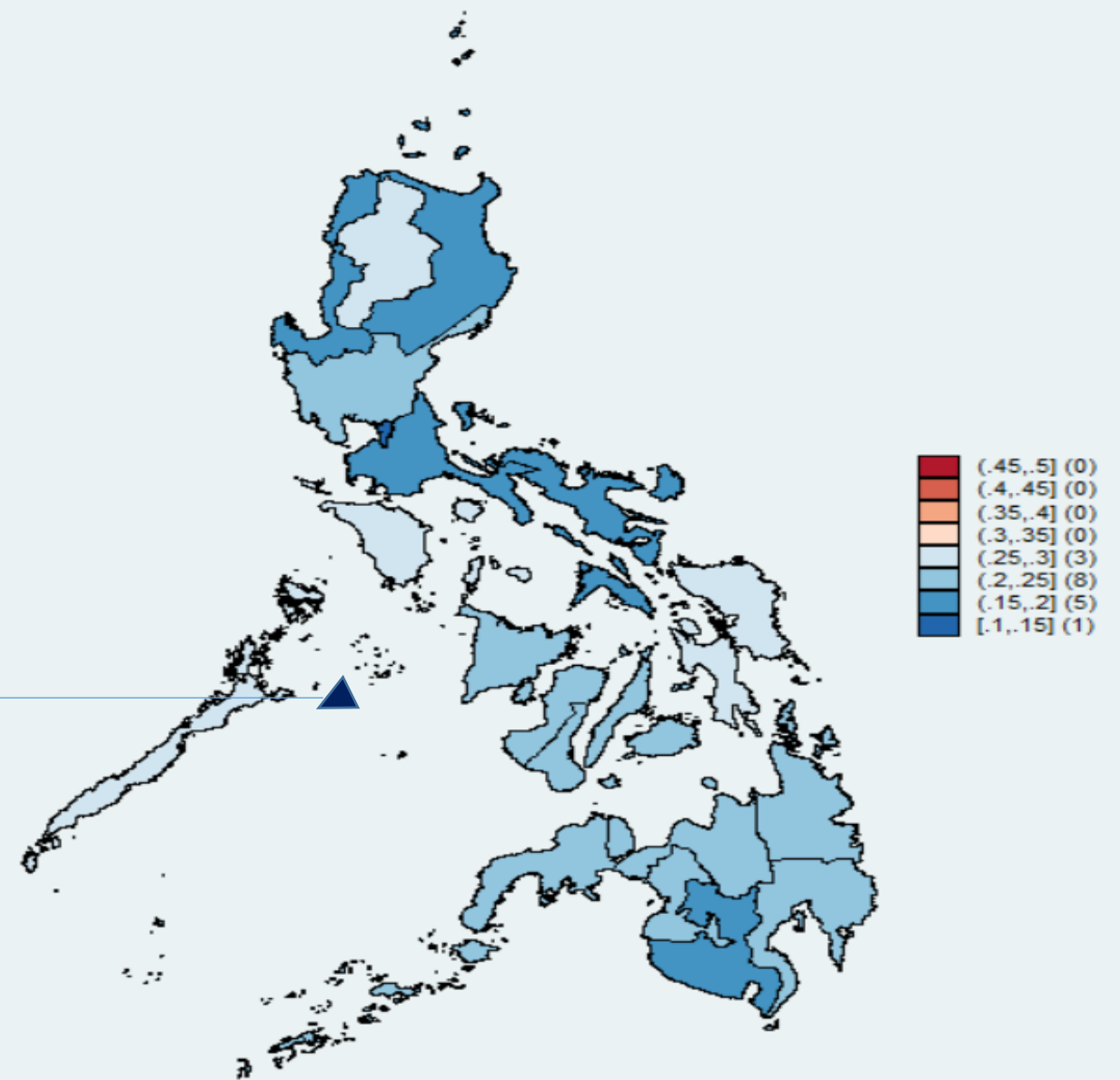
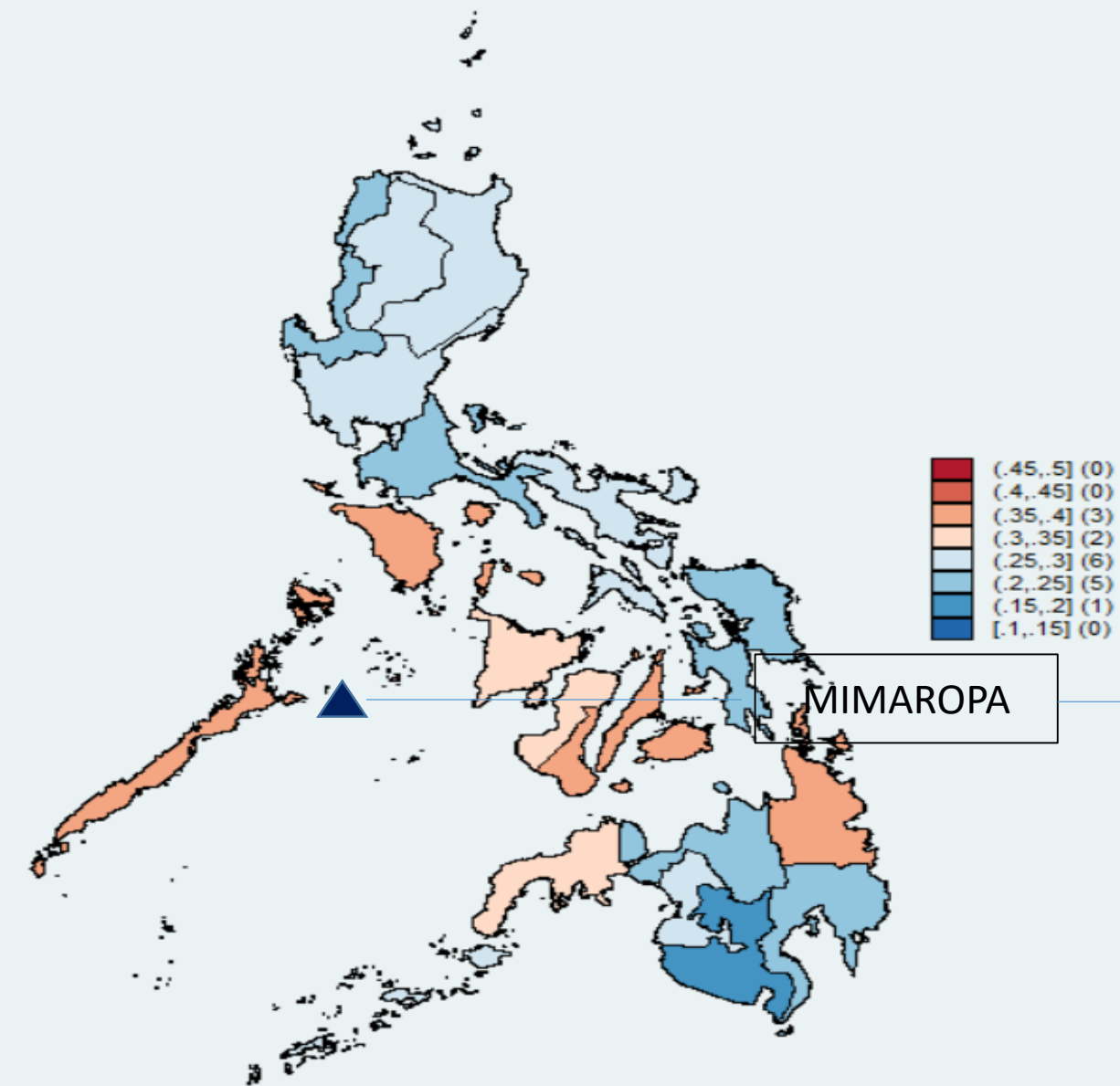
CARAGA



Cohort - based IEE estimates: Mother - son pairs

1960-64 Cohort

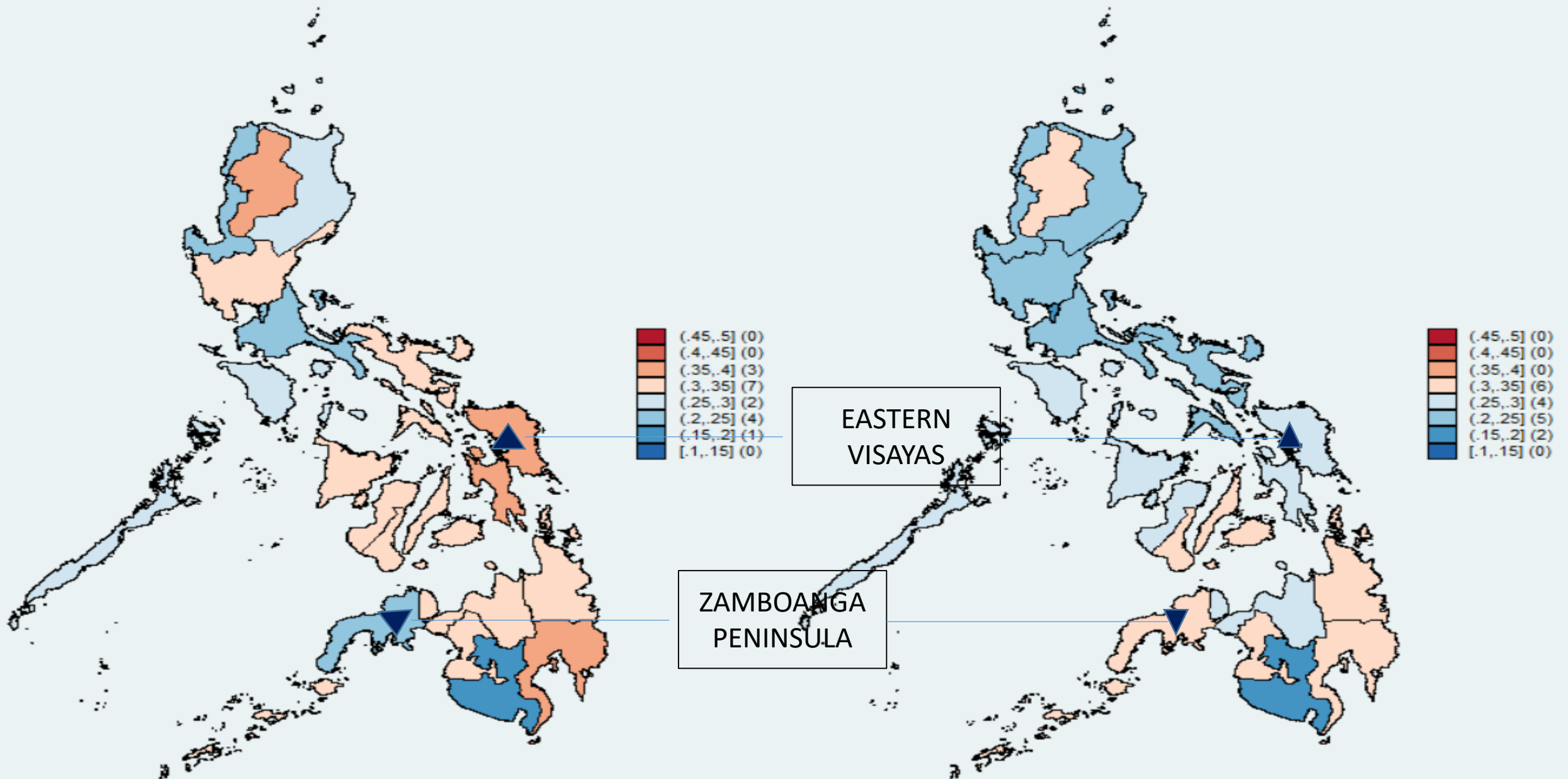
1980-84 Cohort



Cohort - based IEE estimates: Father - daughter pairs

1960-64 Cohort

1980-84 Cohort



Cohort - based IEE estimates: Mother - daughter

Children's schooling progression and parental education:

Definitions

- Using a simple technique, schooling-age children can be categorized into three outcomes, namely: delayed, on-time, and advanced.
- A child's schooling progression is **on-time** if the child's HGC is grade 1 at age 7 or 8, if the child's HGC is grade 2 at age 9, and so on. A child's schooling progression is **delayed** if the reported HGC is lower than the preceding HGC-age pair and **advanced** if the reported HGC is higher.

Children's schooling progression and parental education: Model

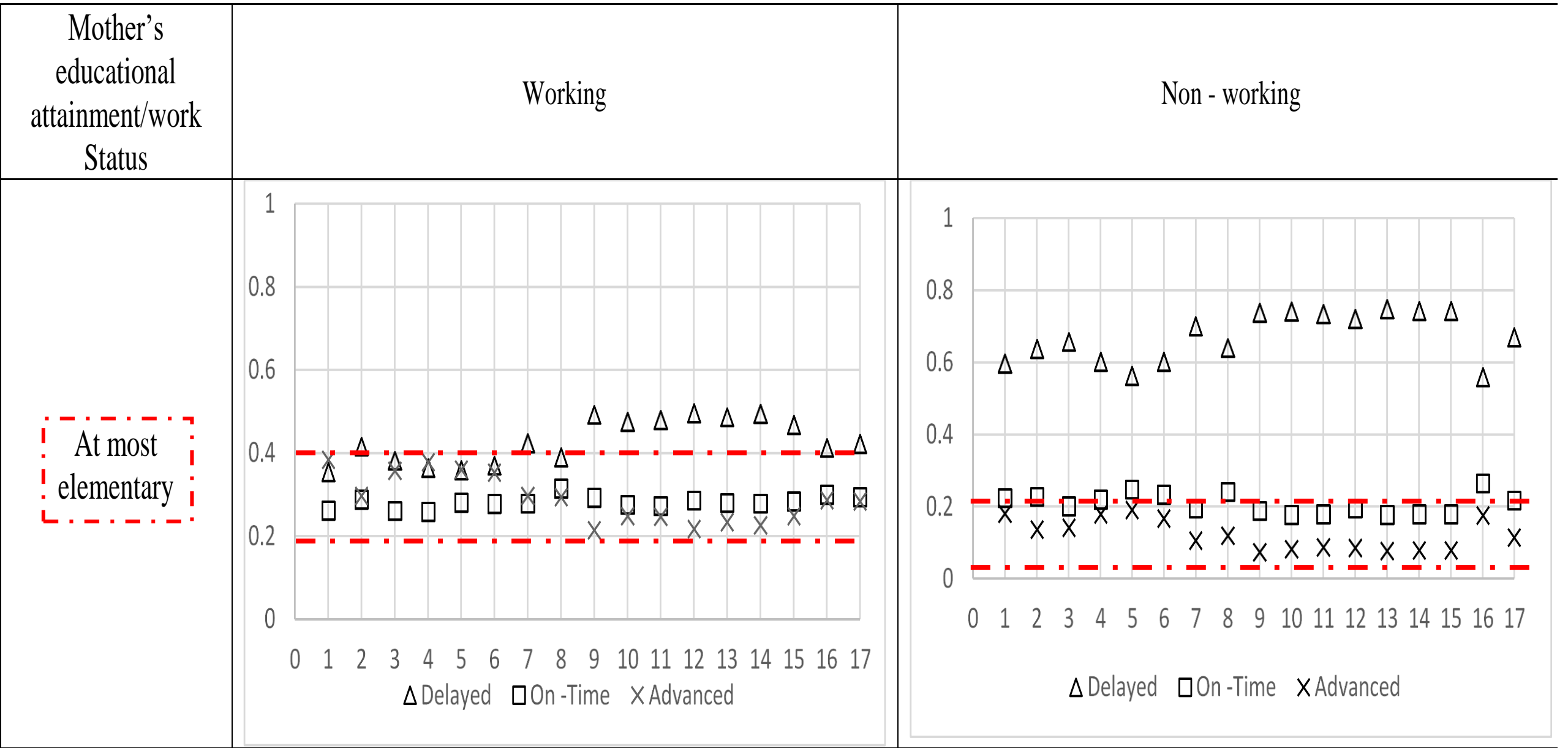
- Assuming that the **observed progression outcomes** are generated by an underlying **latent process** that may be associated with **children's propensity to achieve progress**, this process, $e_i^* = x'\beta + \epsilon$, is an underlying linear stochastic process. Following (Greene, 2003), all the possible values of a child's education can be mapped on e_i^* .

$$\begin{aligned} e_i &= \textit{Delayed} \quad e_i^* \leq 0 \\ &= \textit{On time} \quad 0 < e_i^* \leq v_1 \\ &= \textit{Advanced} \quad v_1 < e_i^* \end{aligned}$$

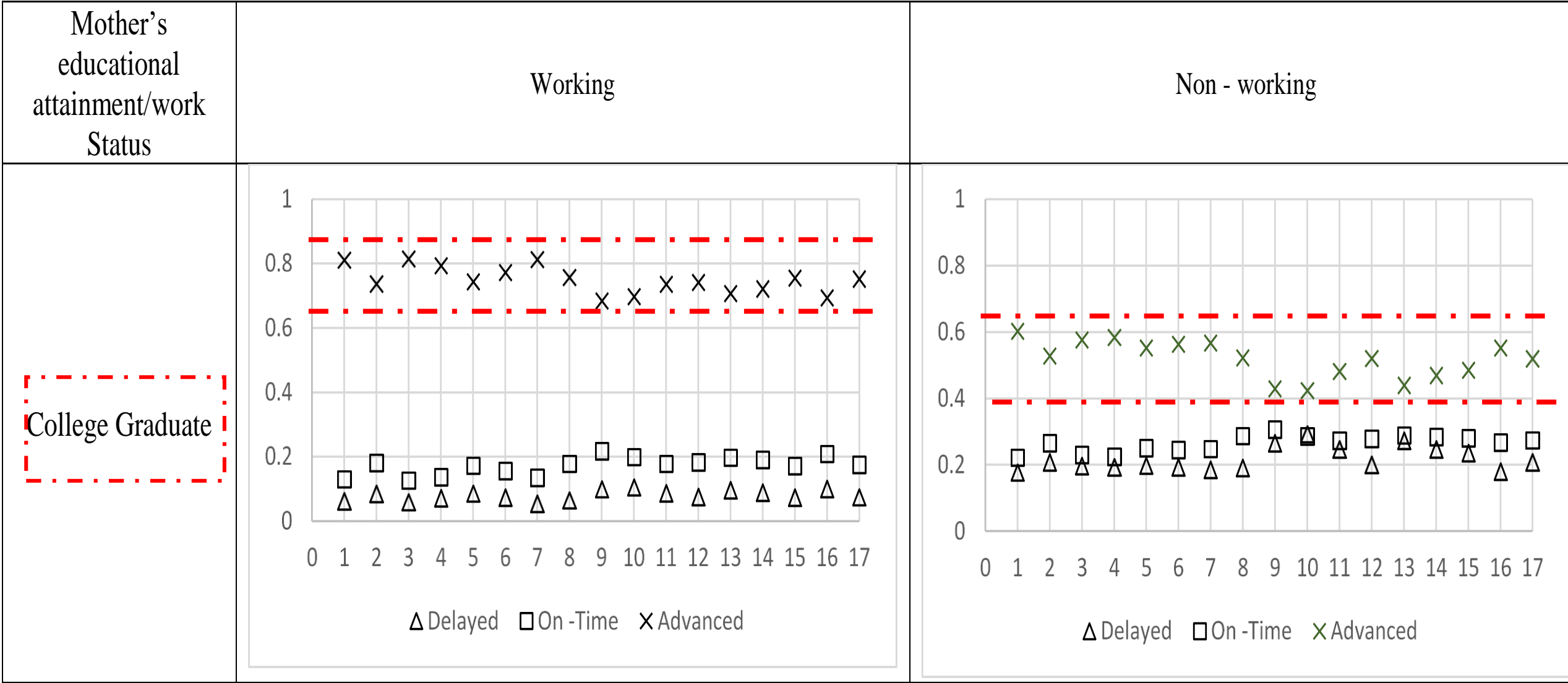
Schooling progression model estimates

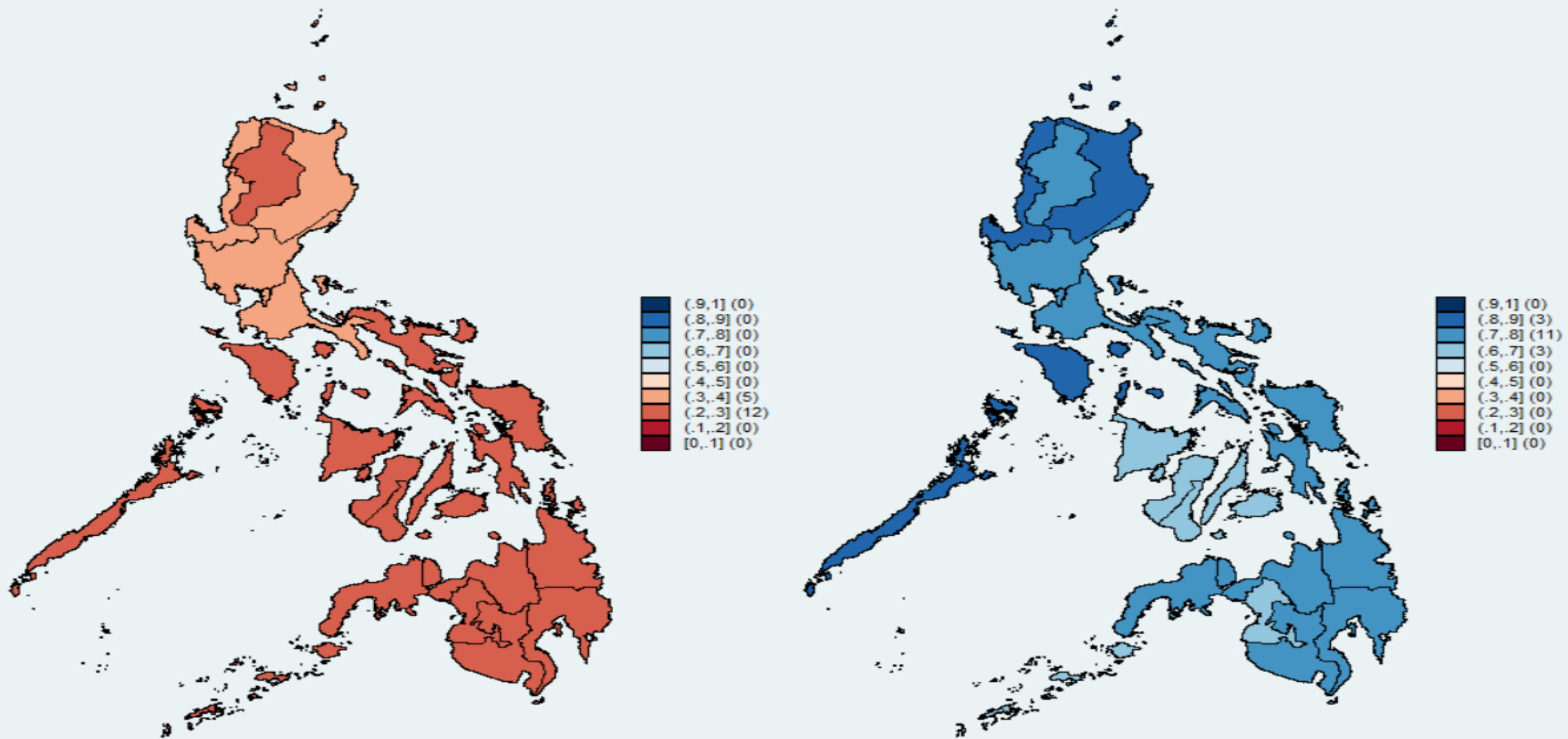
- Sons or daughters
 - Son's (Daughter's) Progression: Low Human Capital and LFP Status
 - Son's (Daughter's) Progression: High Human Capital and LFP Status
 - Estimated probability that a son (Daughter) is in an advanced progression state: College educated mothers
 - Estimated probability that a son (Daughter) is in an advanced progression state: Low – educated mothers
 - Estimated probability that a son (Daughter) is in an advanced progression state: Working and non – working (College or Low educated) mothers
- *Comparative*
 - Estimated probability that a son or daughter is in an advanced progression state: College – educated working mothers
 - Estimated probability that a son or daughter is in an advanced progression state: Low – educated working mothers

Son's Progression: Low Human Capital and LFP Status

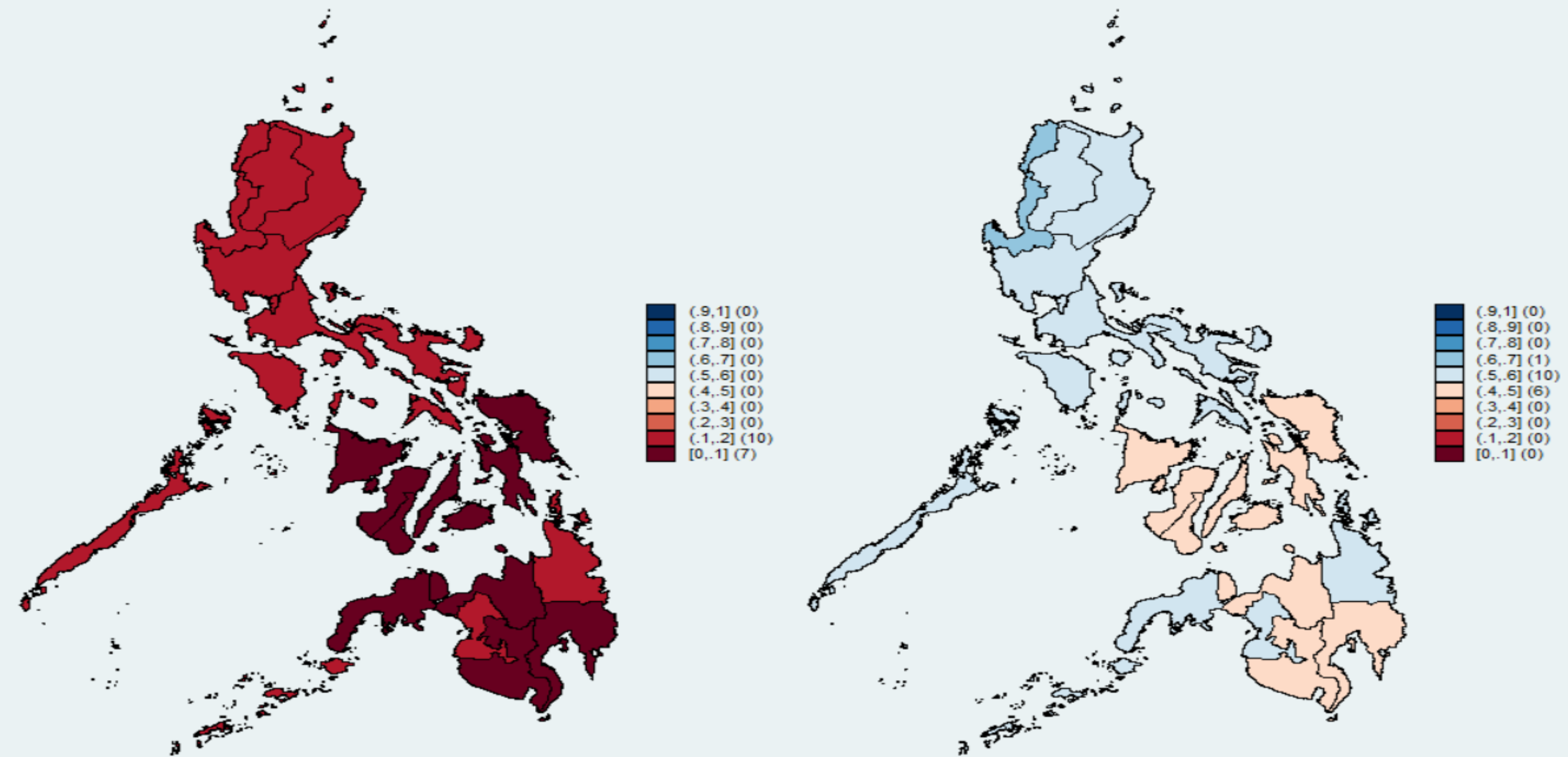


Son's Progression: High Human Capital and LFP Status

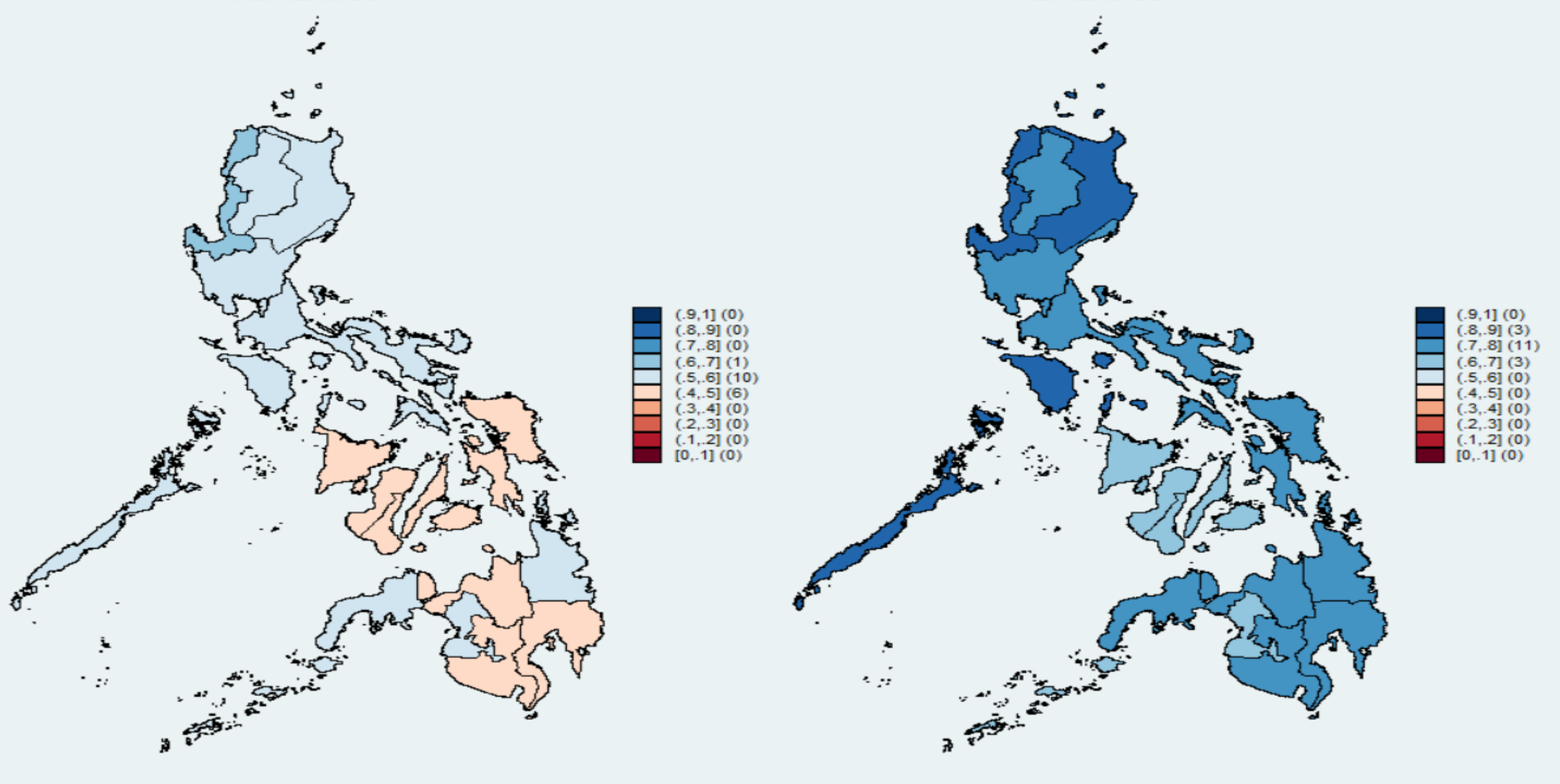




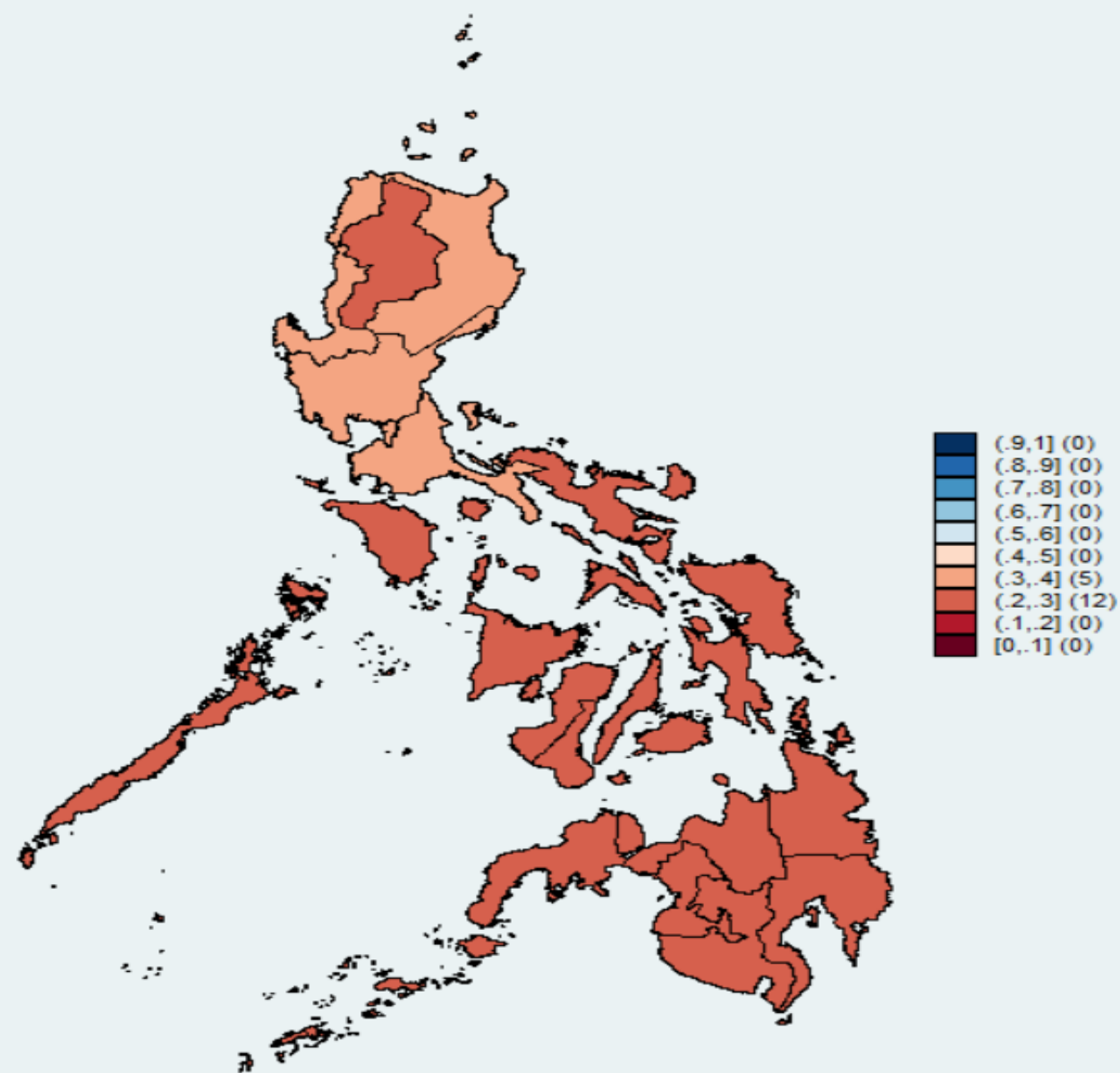
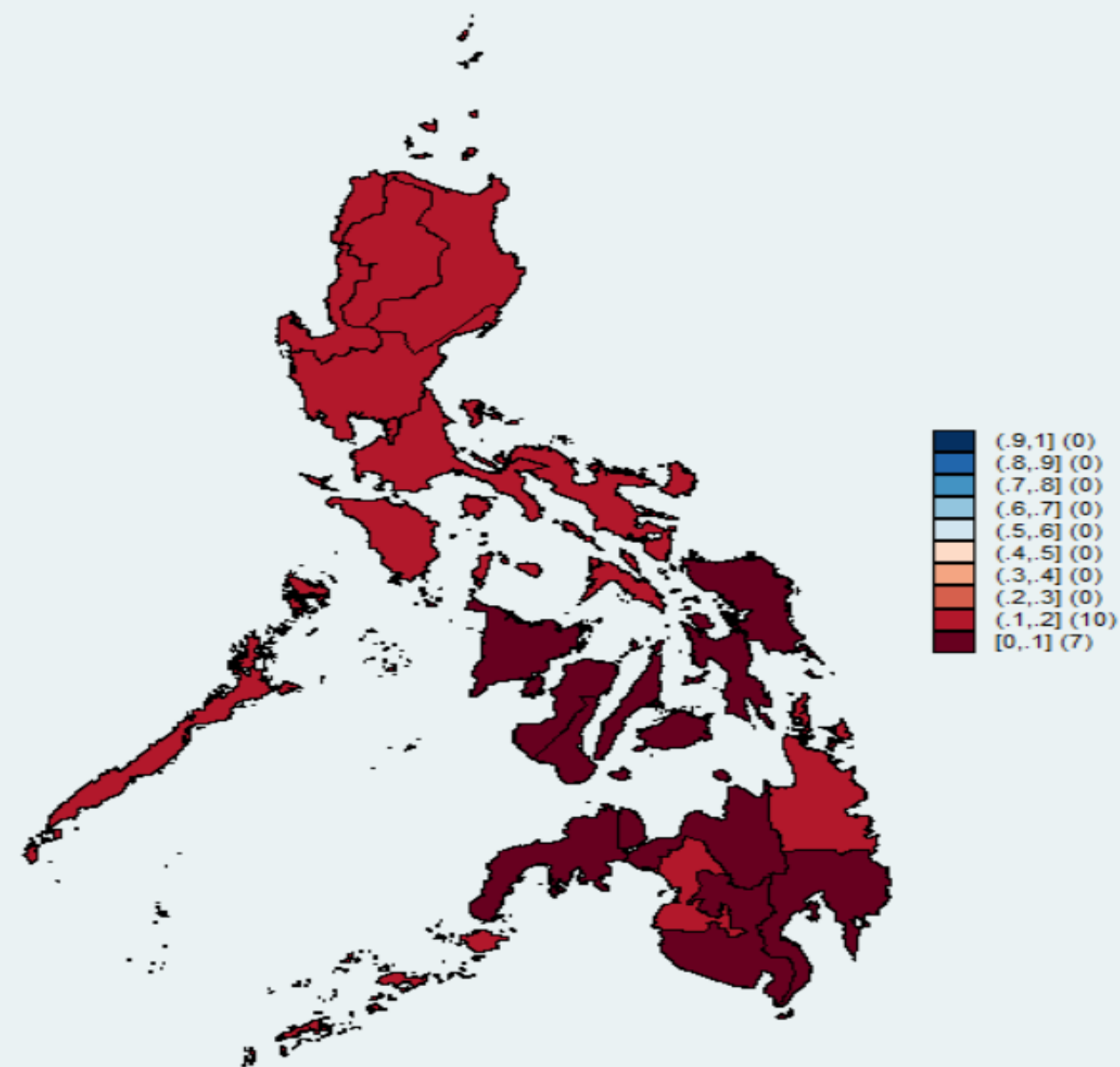
*Estimated probability that a son is in an advanced progression state
Left (Working, less educated mothers); Right (Working, college educated mothers)*



*Estimated probability that a son is in an advanced progression state
Left (Non-working, less educated mothers); Right (Non-Working, college educated mothers)*

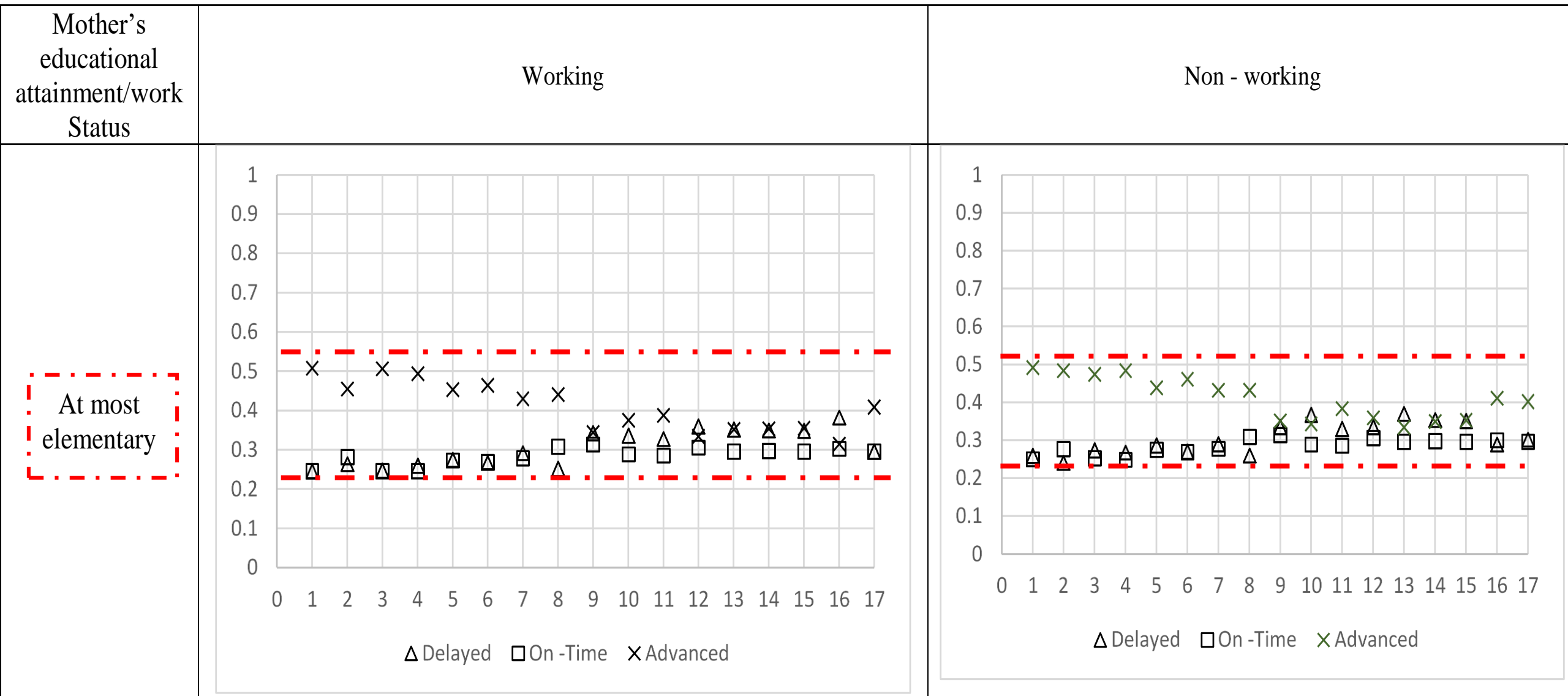


*Estimated probability that a son is in an advanced progression state
Left (College-educated non – working mothers); Right (College-educated working mothers)*

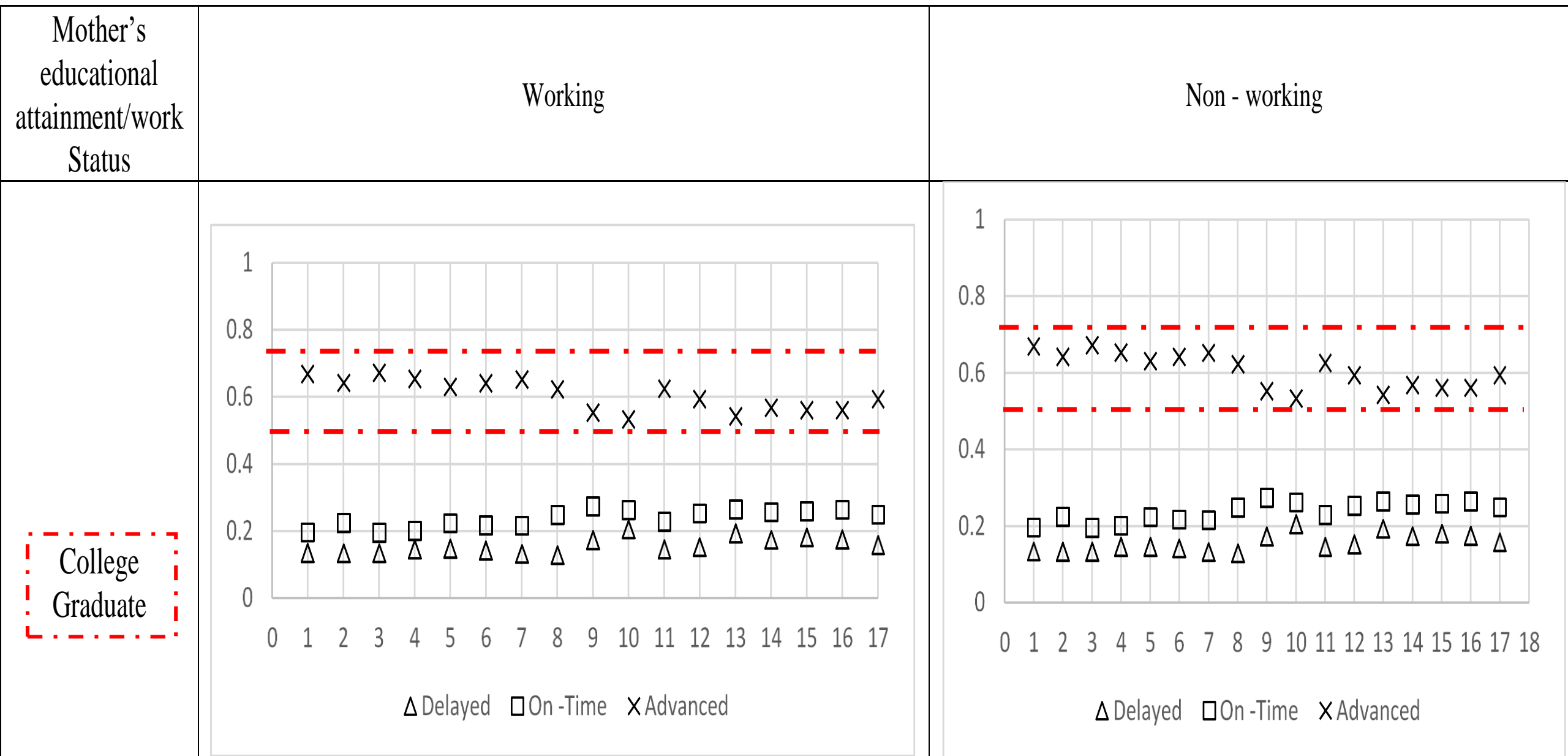


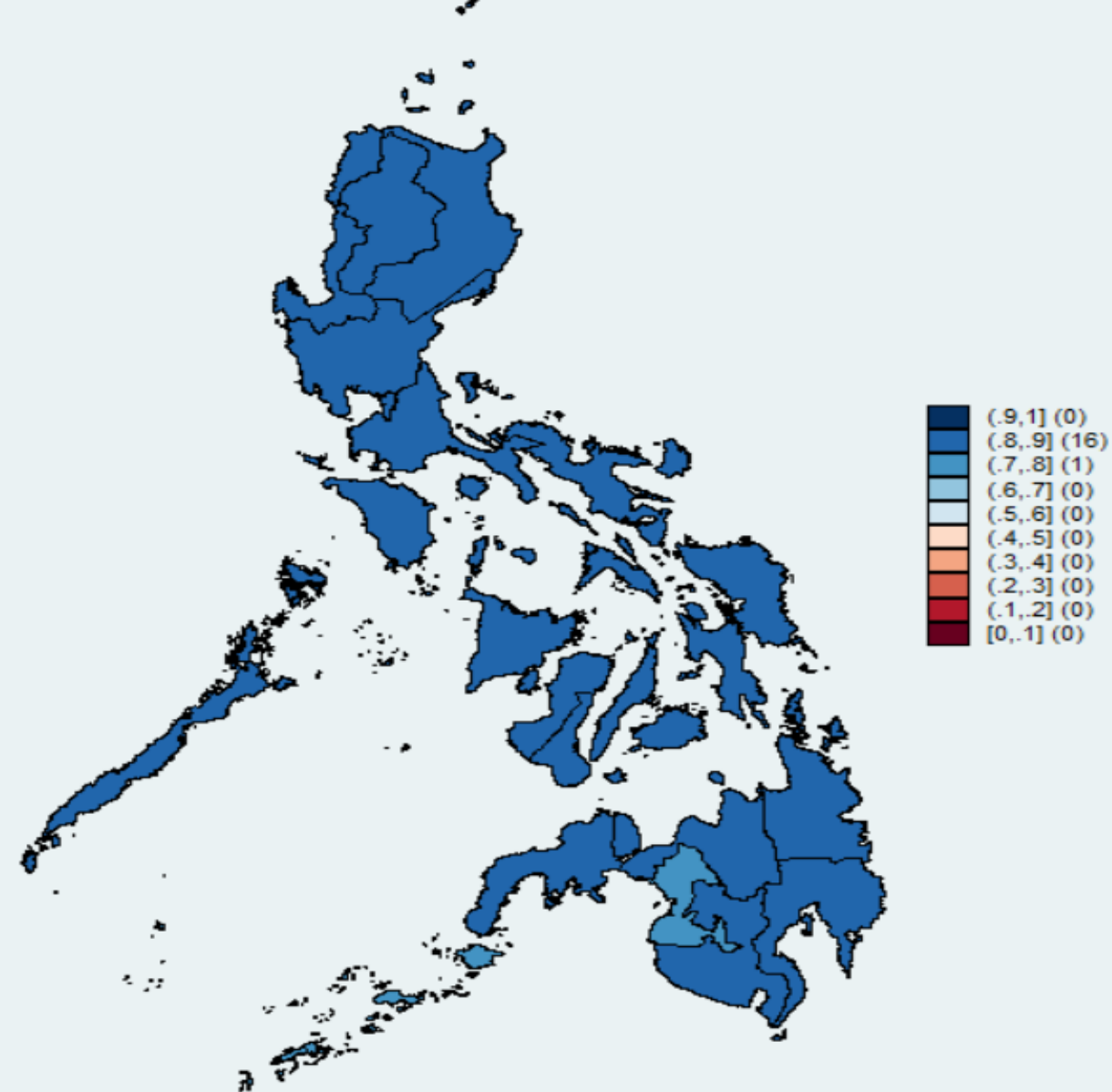
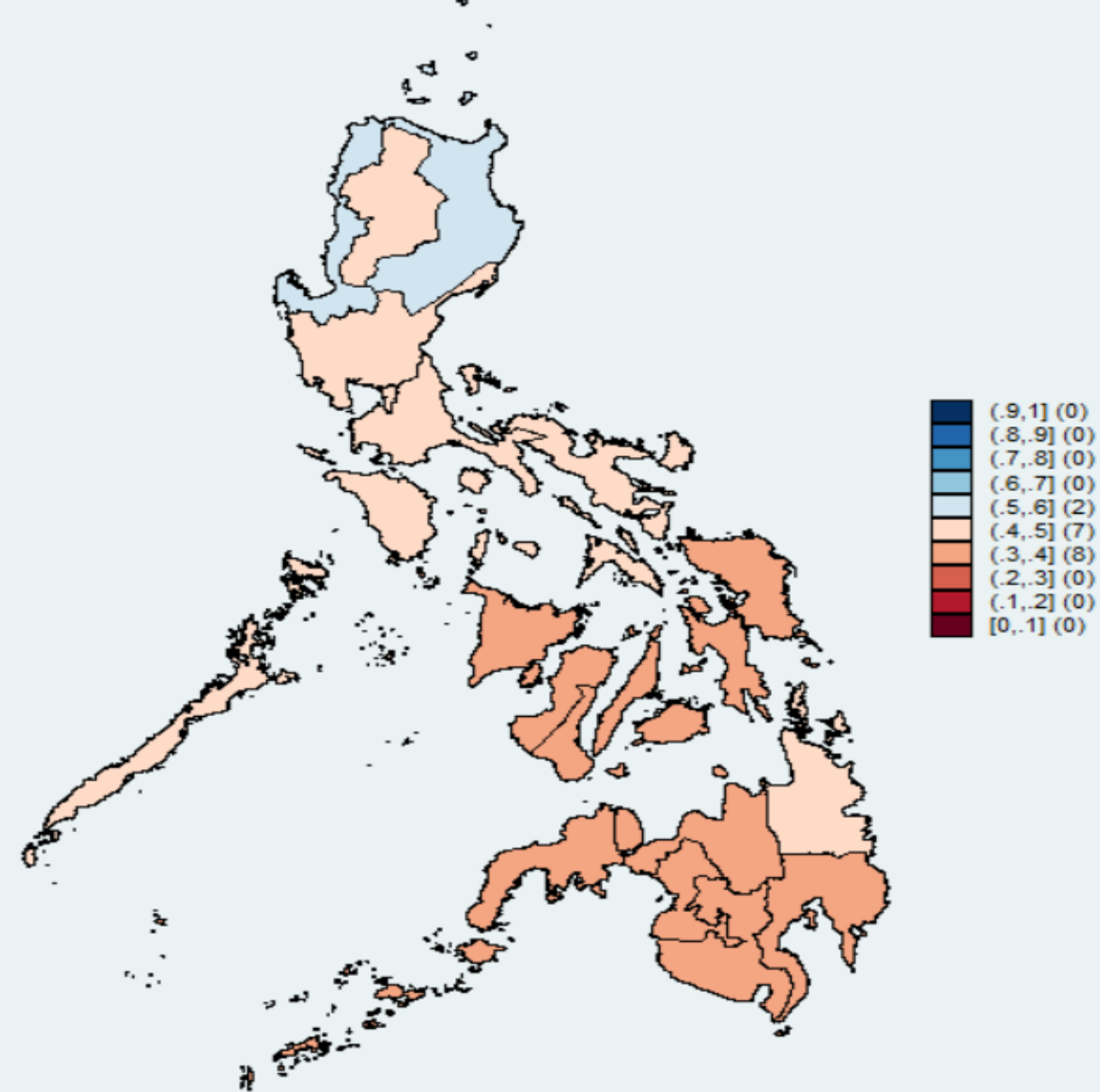
*Estimated probability that a son is in an advanced progression state
Left (Low-educated non – working mothers); Right (Low-educated, working mothers)*

Daughters Progression: Low Human Capital and LFP Status

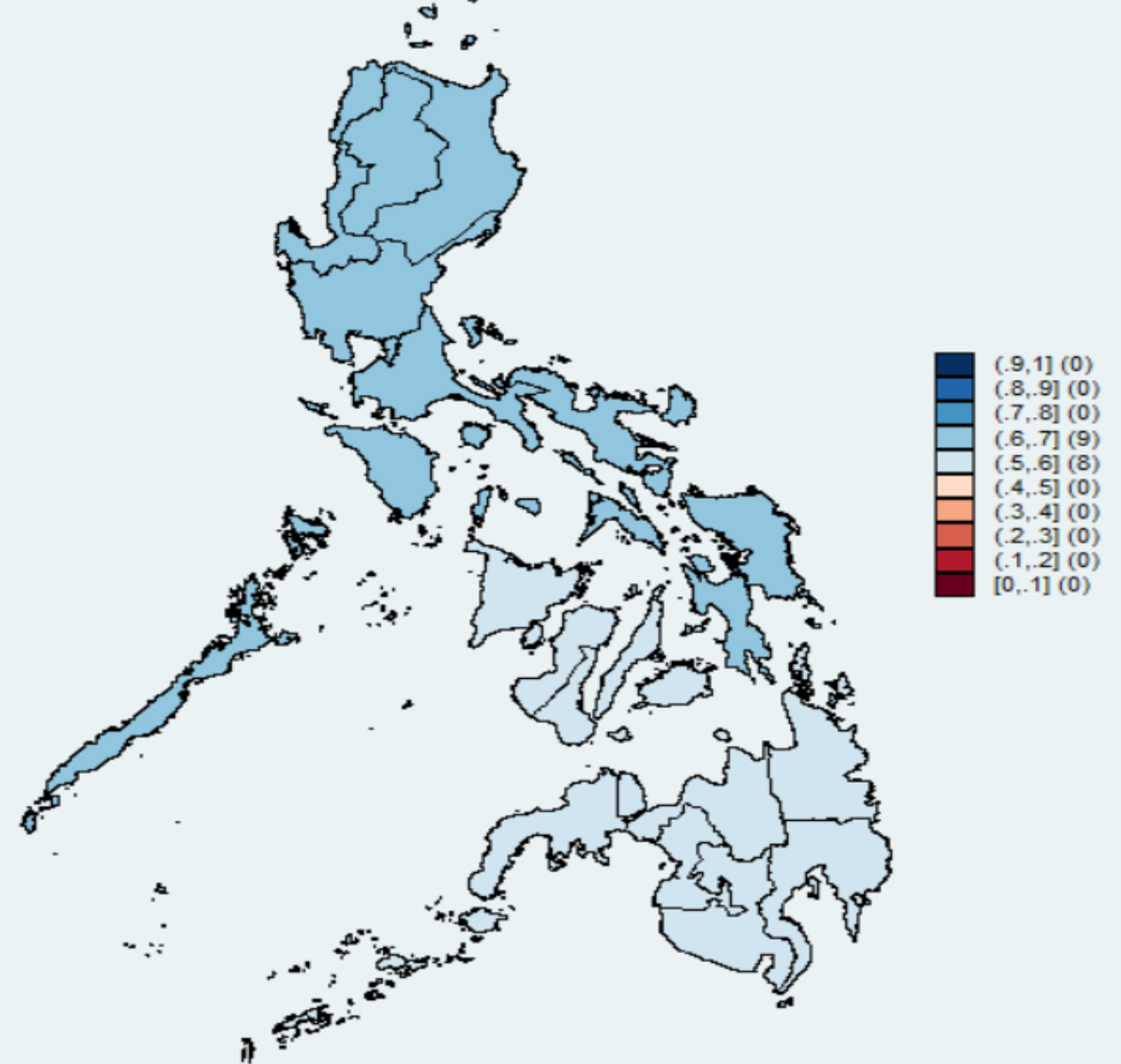
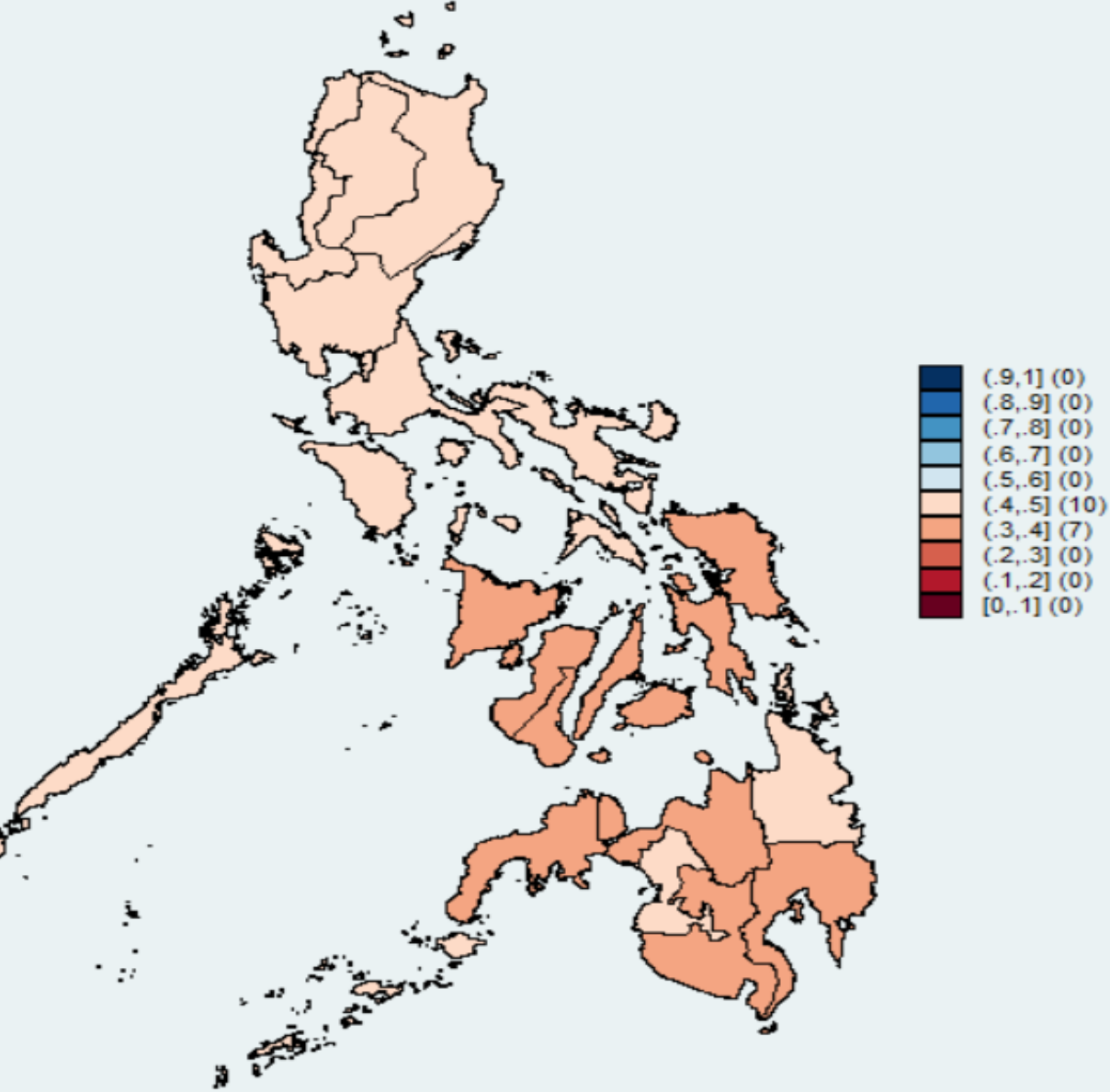


Daughters Progression: High Human Capital and LFP Status

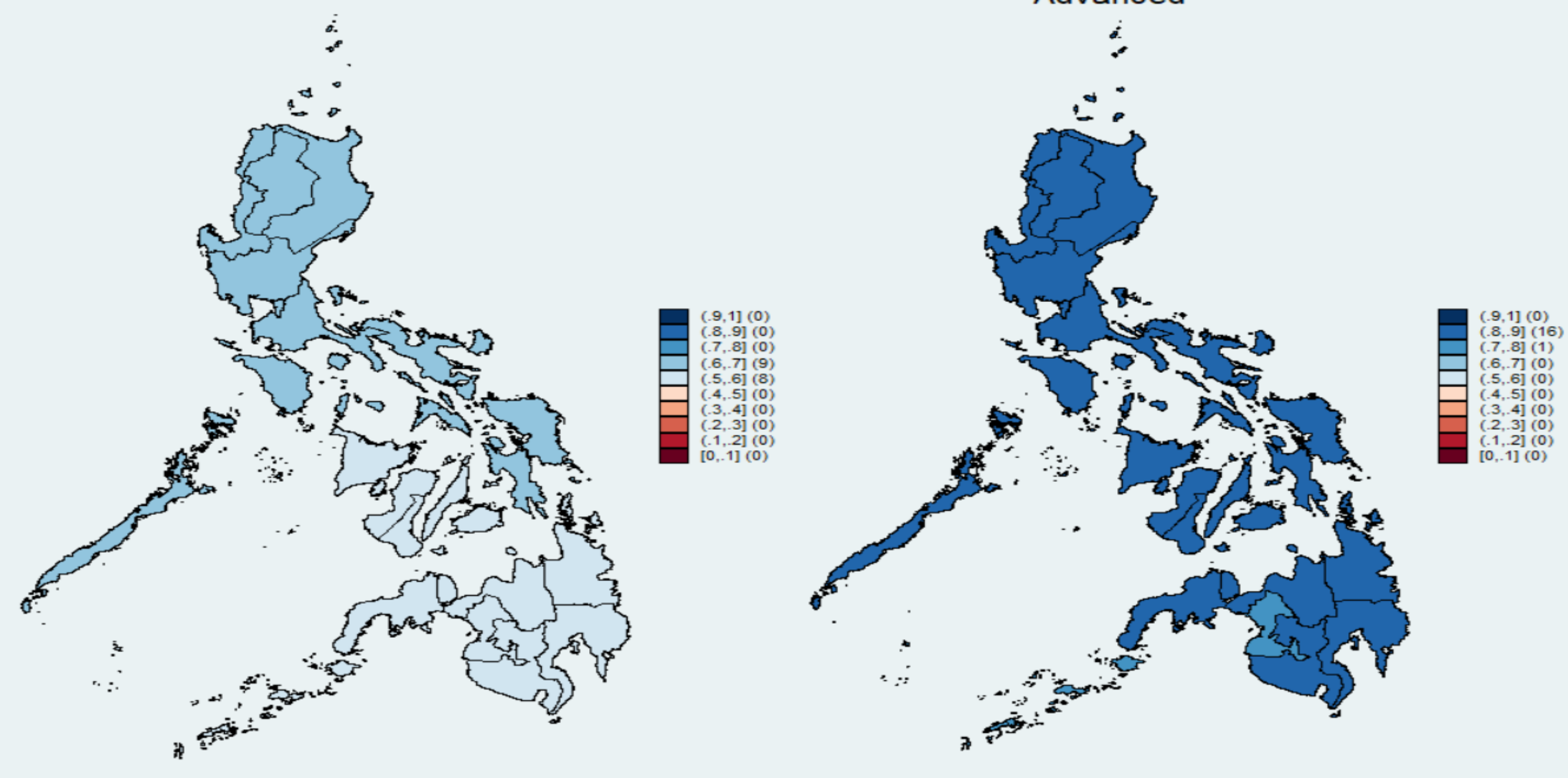




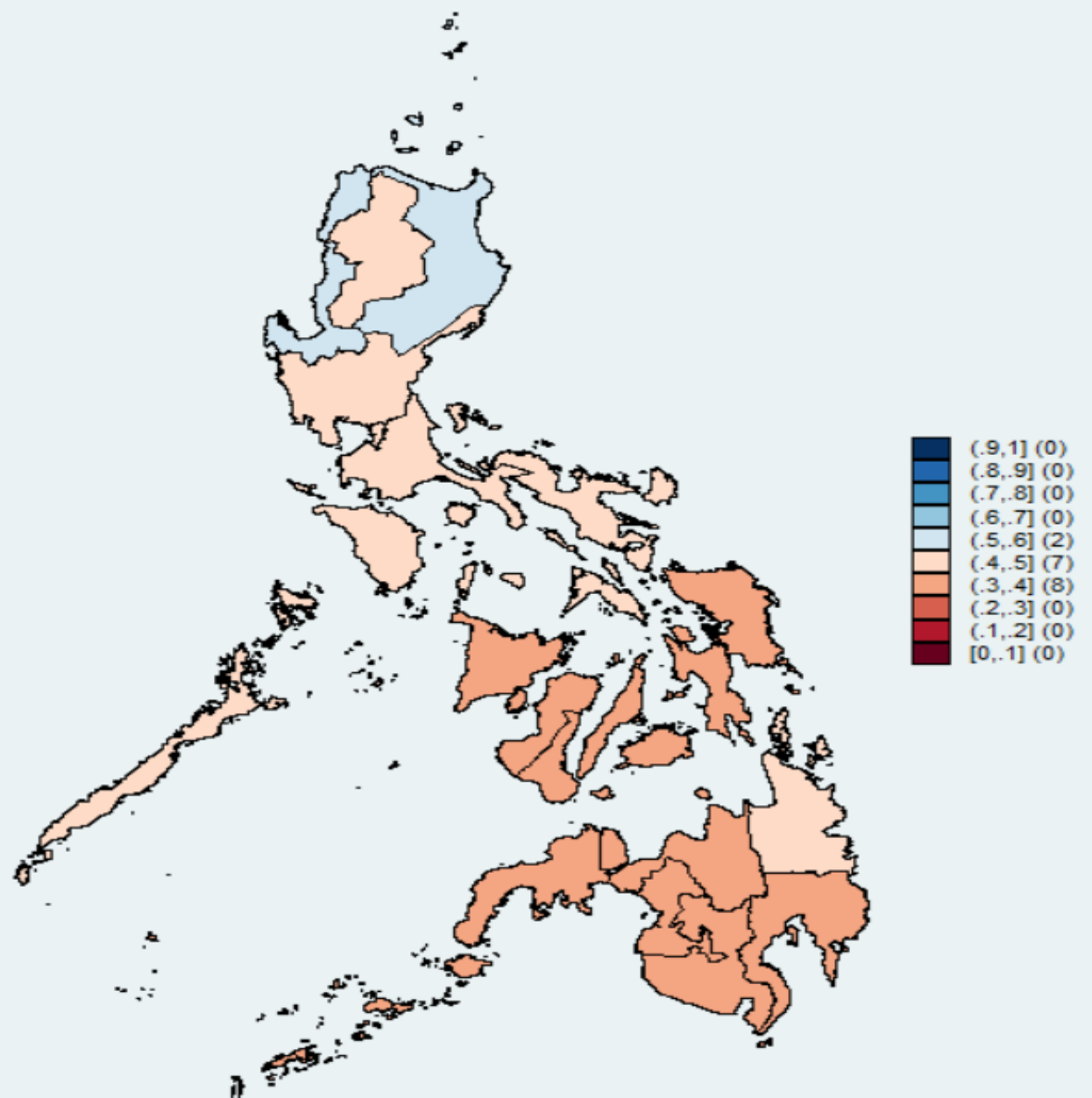
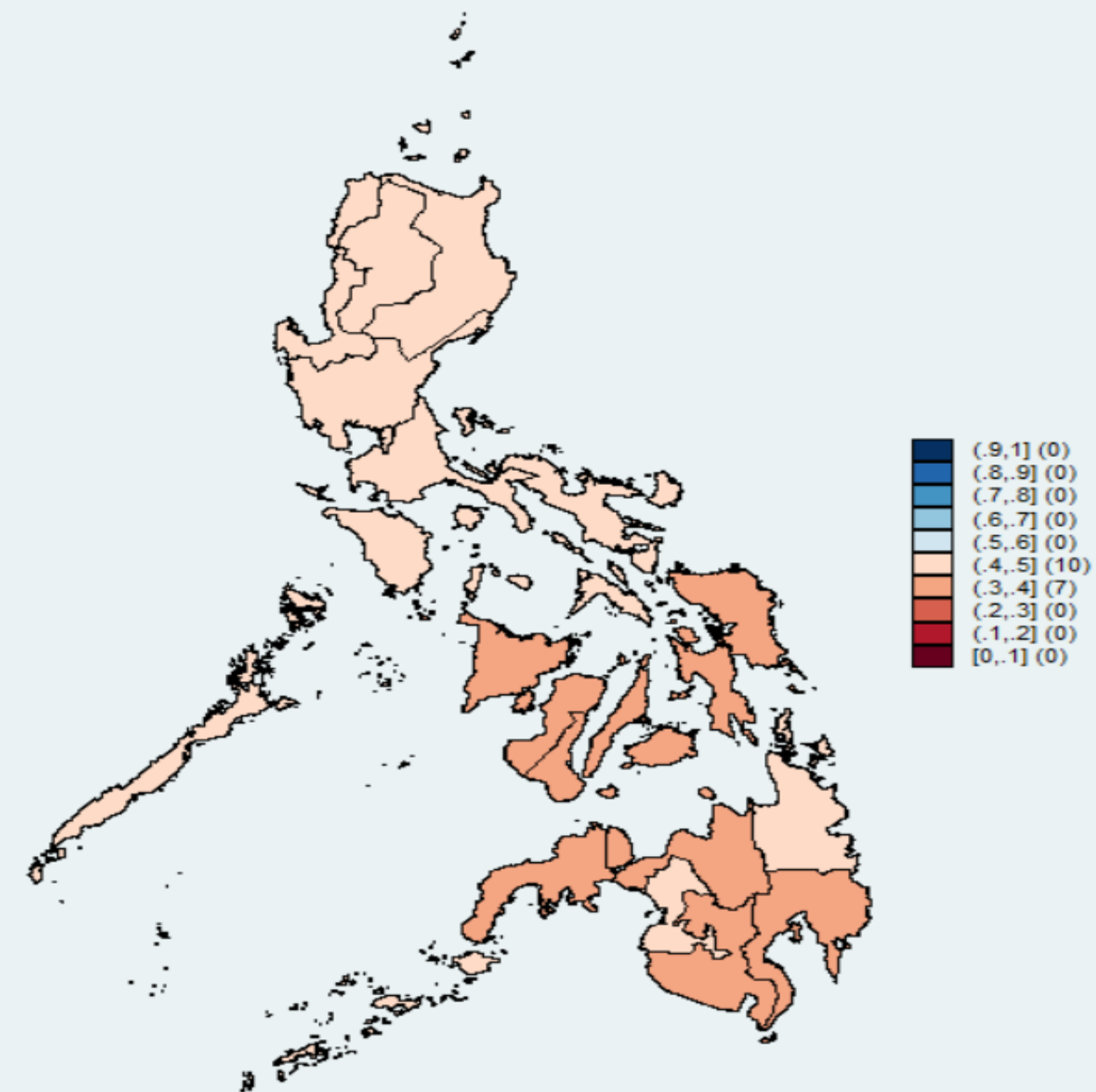
*Estimated probability that a daughter is in an advanced progression state
Left (Working, less educated mothers); Right (Working, college educated mothers)*



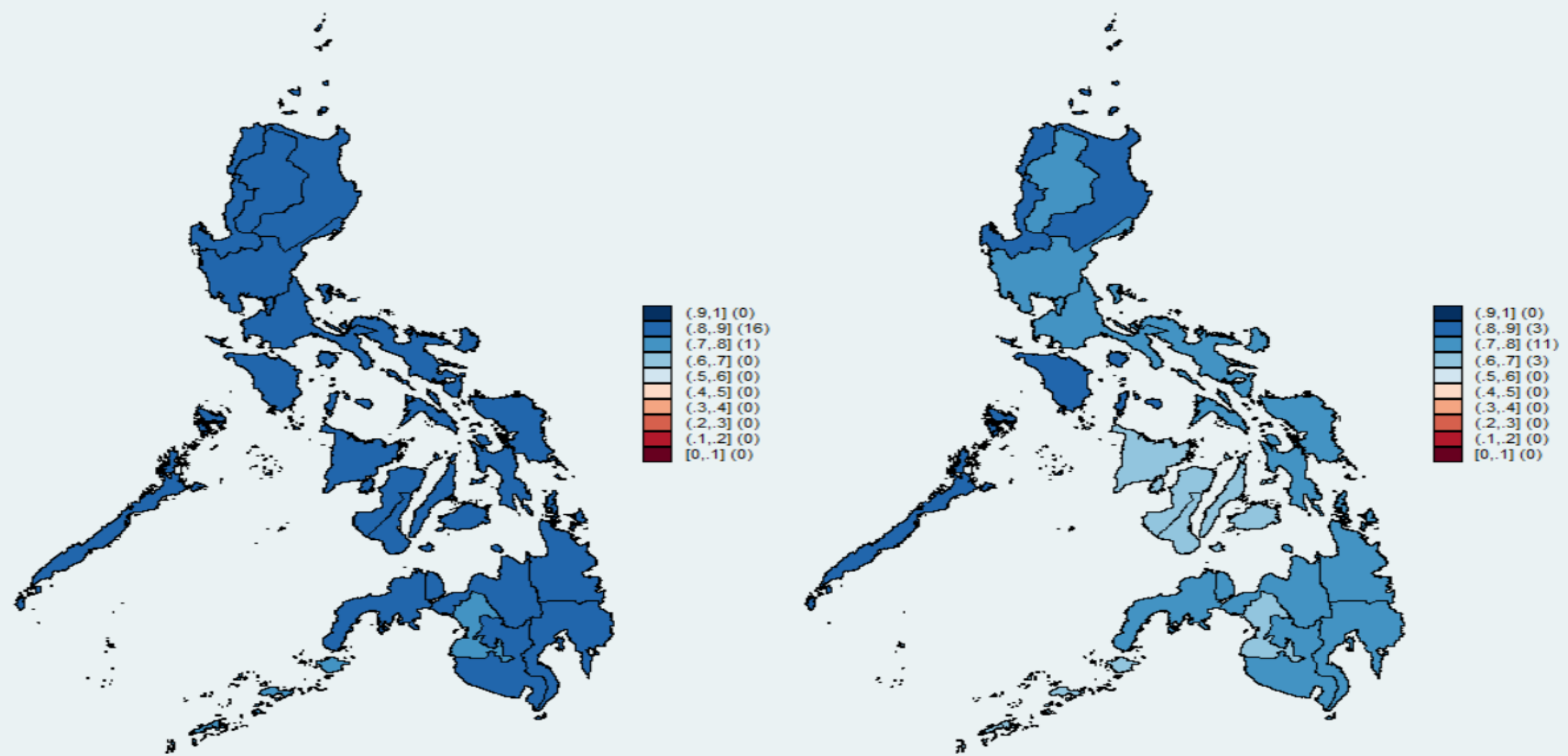
*Estimated probability that a daughter is in an advanced progression state
Left (Non-working, less educated mothers); Right (Non-Working, college educated mothers)*



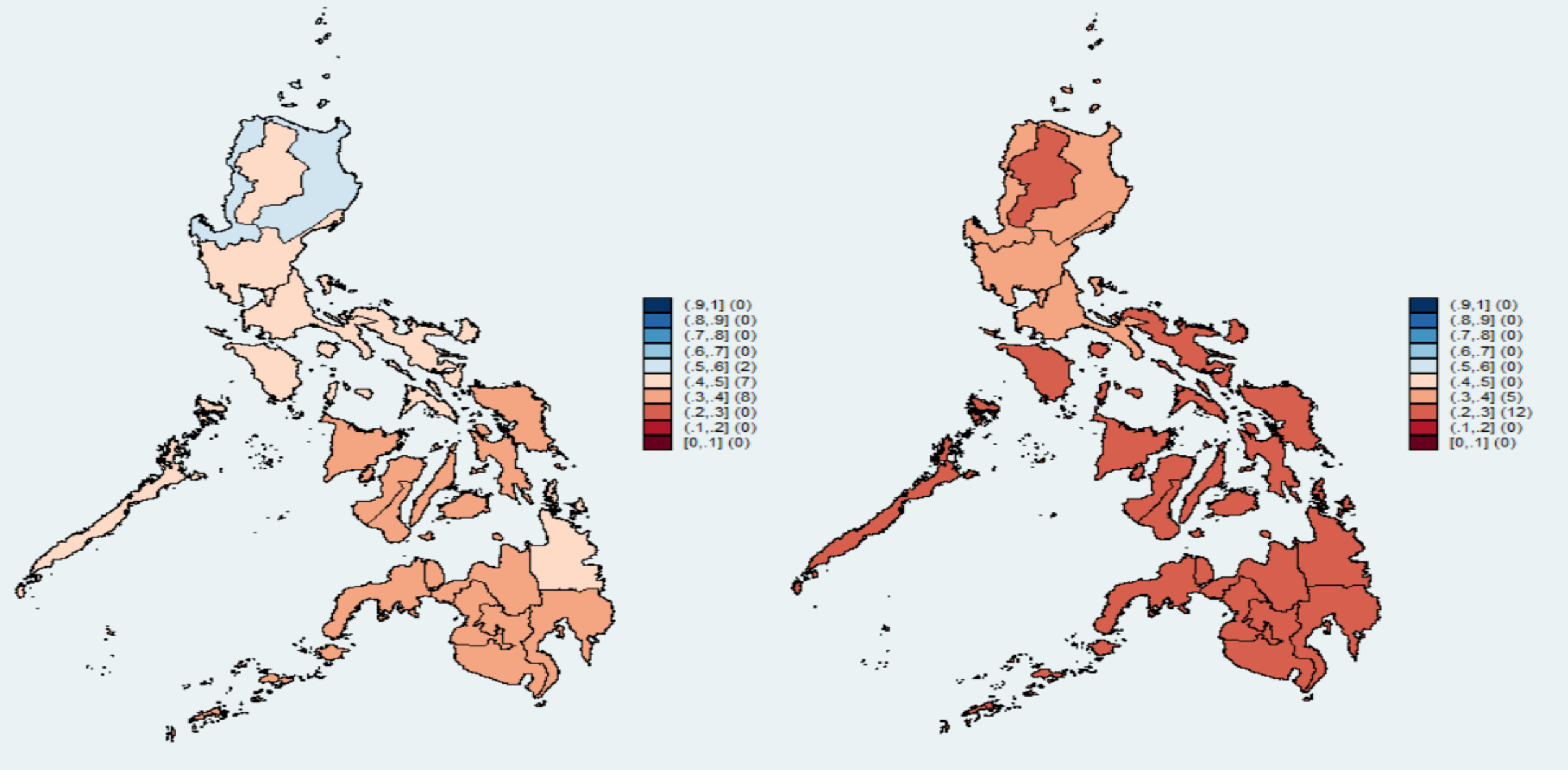
*Estimated probability that a daughter is in an advanced progression state
Left (College-educated, non – working mothers); Right (College-educated, working mothers)*



Estimated probability that a daughter is in an advanced progression state
Left (Low-educated, non – working mothers); Right (Low - educated, working mothers)



*Estimated probability that a child is in an advanced progression state: College – educated working mothers
Left (Daughters); Right (Sons)*



*Estimated probability that a child is in an advanced progression state: Low – educated working mothers
Left (Daughters); Right (Sons)*

Takeaways

- First, while the **gender gap** in educational attainment has been **reversed**, boys' educational performance must improve.
- Second, **maternal education** is important in children's schooling **progression outcomes**.
- Third, results point to the **importance of family resources** to ensure the education of the youth, especially that of the boys.
- Fourth, results of the paper have implications on **labor market policies** that cater principally to women.

Concluding remarks

- Fifth, there is a **substantial variation** in the sons' education mobility estimates across regions. Daughters are mobile in almost all regions.
- Finally, there is still a need to validate the results via qualitative research methods such as (KII/FGD).