

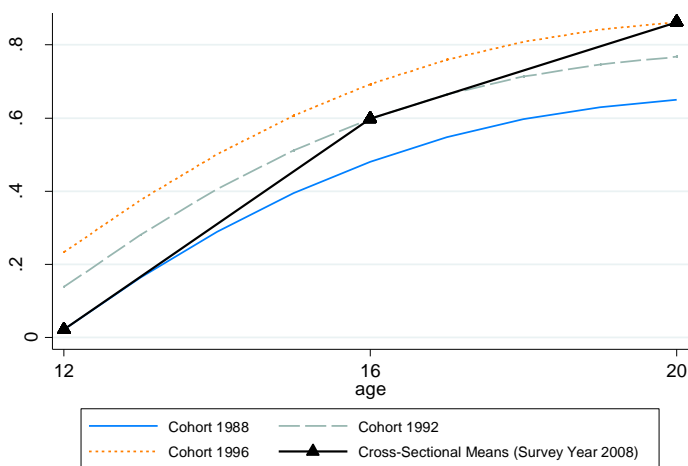
## POLICY BRIEF

# Trends and linkages in schooling and work among Cambodian youth: A synthetic panel analysis

During the decades following the Khmer Rouge regime of the 1970's and Vietnamese occupation in the 80's, the Cambodian government focused on rebuilding what had been destroyed during that time. There was a renewed focus on the education sector: the 90's and 2000's saw large-scale reconstruction of schools and policies which increased access to schooling. Reports estimating schooling outcomes have found corresponding increases in schooling enrollment. To add to existing literature we analyze 11 years of nationally-representative cross-sectional data in a new way: using a **cohort panel approach** developed by Deaton in his 1985 paper (Deaton 1985). We construct a panel of 19 cohorts spanning birth years 1980 to 1998 and estimate their life cycle trajectories as these cohorts aged from youth into early adulthood. This approach allows us to control for contemporaneous time effects and trace out the smoothed cohort and age trends in schooling and work outcomes. We answer the question "For a given age, have schooling and work outcomes improved or declined with more recent versus older cohorts? Are there differences in improvement or decline when comparing males versus females, rural versus urban youth?" Using the variation in experiences across cohorts, we are additionally able provide evidence on how early youth experiences translate to outcomes later in life.

## What is a synthetic panel?

Figure 1. Primary Completion, Cross-section vs. Cohort illustration



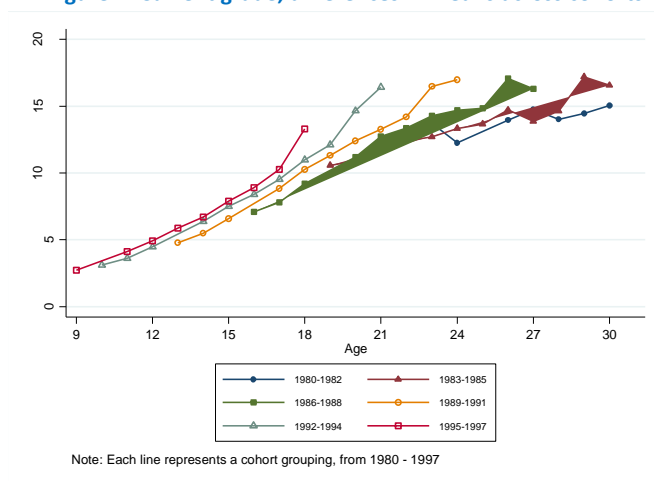
The synthetic or "pseudo-panel" method was developed by Angus Deaton in his seminal 1985 paper as a useful substitute in the absence of genuine panel data. Individuals sharing immutable characteristics, most commonly birth year and gender are grouped into cohorts. Individual outcomes are then averaged to the cohort level. Because the variables defining cohort membership are present in every survey year, we are able to follow the average behavior or experience of a cohort as they age. These cohort-level averages through time comprise a pseudo, or "cohort" panel. We use 11 years of repeated cross-sections from the **Cambodia Socio-Economic Survey** which are drawn from random samples from the population in each year to construct a pseudo-panel. Our final dataset comprises 19 cohorts from birth-years 1980 to 1998 and observed from 2003 to 2014. Since we are interested in outcomes that occur during youth and into early adulthood, we restrict our analysis to those between age 9 and 30.

**One novelty of using a cohort approach is that it can provide a richer picture of outcomes of interest than using estimates from cross-sections alone.** The “snapshot” offered by a single cross-section can mask important information. If there are pronounced differences across cohorts (as we do find in Cambodia), cross-sectional means would confound the cohort effect of individuals born a certain year with the experience of a particular individual of that age during that survey year. Consider the stylized example in Figure 1. There is a level shift in primary completion across the three cohorts: 1988, 1992 and 1996. Here, we are using smoothed means for a clearer illustration but the raw means produce a similar story (see our paper). If we were to use estimates from survey year 2008 alone at age 12, 16 and 20, one can see that the resulting age profile picks up means across multiple birth cohorts. Cohort-panel analysis allows one to control for cohort as well as contemporaneous time effects to back out the age profile; conversely, one can control for age and time effects to trace trends across cohorts. To do this, we follow methods described in Attanasio 1998 and Deaton and Paxson 1993, detailed in our paper. We can further use this method to illustrate differences in this “cohort effect” by gender and region to see if more disadvantaged subgroups are ‘catching up’.

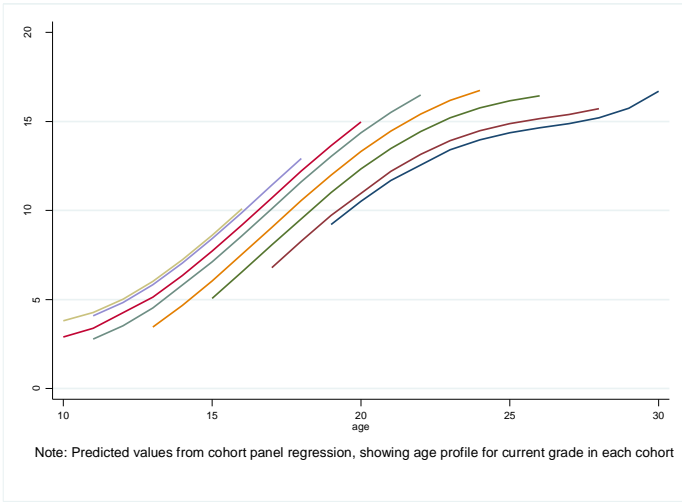
**The second novelty is we can use the differences in experiences across cohorts to explore the dynamic relationship between cohort “youth” experiences and their later outcomes.** The basic set-up is a regressing cohort work experiences (agriculture work, paid and unpaid work) in young adulthood on our independent variable of interest, “youth cohort experience” which we define to be the average schooling and work experience of a cohort at a particular age. For early-cohort schooling experience, we use lower and upper secondary schooling completion at 17 and 20: these are three years after the official age of being at the last grade at each level (age 14 for grade 9 and age 17 for grade 12, respectively). For early-cohort labor experience, we define it at age 16, which is based on the average age of leaving school in Cambodia (ILO 2013). Because three separate factors affect the individual means comprising a cohort panel - age, time and cohort effects- we must make some additional assumptions to account for these effects and isolate the independent variable of interest following previously used methods. These are further detailed in the paper.

## Findings

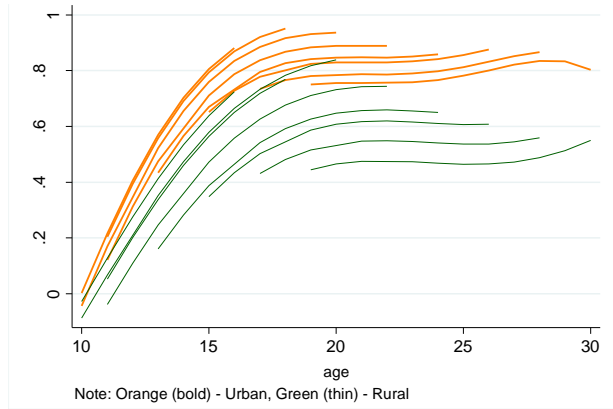
**Figure 2. Current grade, differences in means across cohorts**



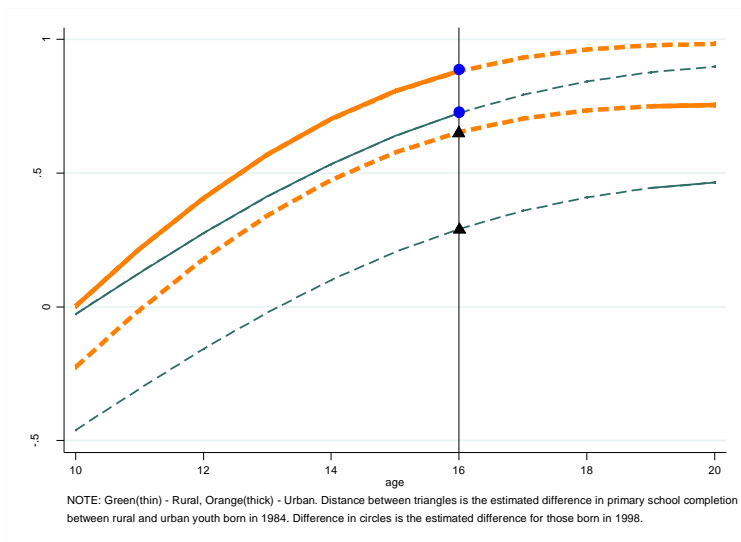
**Figure 3. Age effect of current grade across cohorts (1980-1998)**



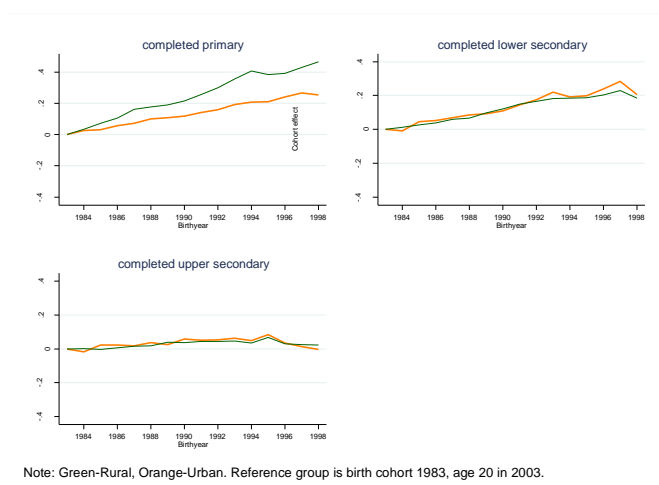
**Figure 4. Smoothed age profiles, comparing rural and urban cohorts**



**Figure 5. Smooth age profiles, comparing 1984 and 1998 rural and urban cohorts**



**Figure 6. Cohort Effects for Schooling Completion (1983-1998), Urban vs Rural**



**During the several decades of rapid societal change, to what extent has schooling attainment and work outcomes differed across youth born within 19 years of each other? Which outcomes improved, have any declined, and by how much?**

**Grade progression rates and education attainment have increased with each younger cohort, suggesting progress towards greater quality and inclusivity.** Figure 2 shows raw means for current grade across cohorts. The mean grade for 17 year olds born between 1986 and 1988 is 7.8. This increases steadily with later cohorts so that those 17 year olds born in 1995 to 1997 have an average current grade of 10.3 – an increase of 2.5 grades in about a decade. This trend is corroborated by Figure 3, which plots estimated values after controlling for age and time effects. Overall, results suggest a reduction in grade-repetition and late-entry. There are similar level increases for all ages in primary and secondary completion for more recent cohorts compared to earlier ones. The effect is still positive but less pronounced for upper secondary completion, which remains low.

**Economic activity starts at a young age in Cambodia. However, economic activity among school-aged children is declining with more recent cohorts.** 60 percent of 14-year olds born in 1990 are engaged in economic activity, compared to 38 percent born in 1998.

**Among working youth, there is a substitution away from unpaid work towards paid work, as well as a consistent decline in agriculture work at all ages.**

**Have more disadvantaged subgroups experienced improvements or declines at a similar, faster or slower pace?**

**Gender and regional disparities remain in spite of overall improvements.** Across cohorts women have lower rates of lower and upper secondary completion compared to men. The disparity is high for rural compared to urban youth.

**The economic activity of young women peaks around age 20 and then declines.** This may be because younger women work instead of attend school while older women take care of their families instead of work.

**More rural youth are working compared to their urban counterparts.** Of those who are working, a lower proportion of rural youth get paid and a higher proportion work in agriculture; for these two outcomes there is a level difference between regions at all ages. For urban youth, the prevalence of unpaid work decreases faster the older they get compared to rural dwellers.

**The education achievement gap appears to be closing along some dimensions: Among rural and urban school-goers, the gap in current grade and primary completion closed by more than half in a span of 15 years** (Figures 4-5.) Figure 4 shows the stacked age profiles for primary completion for the range of cohorts in our sample, separating by rural and urban. Overlapping curves suggest little between-cohort variation; highly dispersed curves suggest greater between-cohort variation. Figure 5 visualizes these trends more clearly by showing only the difference in urban and rural primary completion for the latest cohort (1998) compared to the earliest cohort (1984), at some age of interest – here, 16. These figures suggest that even though level differences remain between the regions, cross-cohort improvements are occurring faster in rural areas and hence the gap is closing.

**There is a similar catch-up effect for females compared to males: the gender difference in school enrollment and primary school completion is notably smaller among the most recent cohort (1998) compared to the earlier one (1984).**

**However, these “catch-up” effects do not extend to lower and upper secondary schooling suggesting more targeted policies are needed to address discrepancies among disadvantaged subgroups.** Figure 6 abstracts away from age-specific profiles and shows the change in over-all cohort experience across all ages relative to the base cohort of 1983. Rural cohorts are improving faster than their urban counterparts for primary completion, but not for lower and upper secondary completion. Between males and females, the gap in lower secondary completion has also closed by more than half, though the catch-up does not extend to upper secondary schooling.

**Employment outcomes are also improving relatively faster among women and rural youth compared to men and urban youth.** There is faster increase in paid work and a corresponding decline in unpaid work among rural youth compared to urban youth. The cross-cohort decline in economic activity during school-going ages is also faster among women compared to men.

### **What is the effect of secondary school completion on labor outcomes at older ages, and has this effect changed over time?**

**More schooling during a cohort’s youth is associated with doing less agriculture and less unpaid work in later years.** A 10 percentage point increase in lower secondary completion by age 17 translates to a 6.5 percentage point decrease in agriculture labor for females and 6.1 point decrease for males relative to the average agriculture work in each survey year and controlling for age. The association between upper secondary completion and decreases in agriculture work is higher (14.3 and 21.2 percentage points respectively for males and females).

**Higher upper secondary completion is associated with a larger decline in informal work for males compared to females.** A 10 percentage point increase in upper secondary schooling translates to a 21.7 percentage point decline in agriculture work and a 20.1 decline in unpaid work for males, relative to the average yearly performance. This drops to 14.4 and 15.8 respectively, for females.

**The effect of secondary completion on informal and paid work is more pronounced for later birth cohorts compared with earlier ones, suggesting increasing returns to schooling over time.**

### **How persistent is informal work?**

**For both males and females, there is a persistent and comparable overall effect of doing informal work at age 16 on doing similar type of work later in life.** For female cohorts, a 10 percentage point increase in agriculture work at age 16 is associated with an 8.5 percentage point increase in agriculture work and 8.9 increase in unpaid work, relative to the overall performance in that year. For males, this increases to 8.8 and 10.2 respectively.

**Agriculture work is persistent throughout young adulthood, while unpaid work tends to be confined to early youth labor market experiences.** Youth who do agriculture work at age 16 are almost equally likely to continue doing agriculture work at ages 18-21 as ages 22-27. Conversely, doing unpaid family or own-account work at youth

does not have a lasting effect. A 10 percentage point increase in unpaid work at 16 leads to a 16.0 percentage point increase in unpaid work at ages 18-21. At 22-27, the coefficient's sign is still negative but the magnitude is less than a third and the effect is no longer significant.