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Decomposing Intergenerational Income Elasticity: The Gender-differentiated Contribution of Capital Transmission in Rural Philippines

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Summary. — Using longitudinal data from rural Philippines, we decompose intergenerational income elasticity (IGE) into five distinct pathways: intergenerational transmissions of health, education, land, and spouse education capital, plus residual correlation in productivity. Intergenerational human capital transmissions from mothers are stronger than those from fathers; maternal education is the parental capital most strongly associated with IGE. While naïve IGE estimates are indistinguishable for sons and daughters, the pathways that generate these results differ strikingly. For sons, IGE is entirely explained by parent-to-child capital transmission. By contrast, strong income correlation exists between daughters and parents even after controlling for parent and child capital endowments.

Key words — Intergenerational income elasticity, Intergenerational income transmission, Intergenerational health transmission, Intergenerational education transmission, Land inheritance, Human capital formation

1. INTRODUCTION

Estimates of intergenerational income transmission help us to gauge a crucial characteristic of society: equality of opportunity. Are all children — perhaps controlling for preferences and ability — equally likely to forge a successful, or unsuccessful, future livelihood? Or are children destined to stand upon the same socio-economic rungs as their parents, as would be true if incomes were perfectly correlated across generations? If a child's income is highly correlated with his or her parents', as is commonly found, through which mechanism(s) does this transmission occur? Do the parents' productive assets pass to the children, and if so, is it human capital embodied in education and/or health, or is it physical capital, such as agricultural land? Or is it instead the productivity with which parents and children employ their wealth, perhaps due to unobserved but intergenerationally correlated ability or social connections? Are patterns of intergenerational transmission gender neutral, or do mothers and fathers exert identifiably different effects on their children's adult well being? Do daughters and sons depend differentially on parents for their later adult incomes? We know surprisingly little about these questions that speak to the underlying structure behind oft-observed intergenerational income correlations.

That lacuna matters. Understanding the pathways that tie children's economic outcomes to those of their parents allows policymakers to craft policies that work towards providing all children with reasonably equal economic opportunities in life. For instance, perhaps wealthier parents invest more in (better) education for their children, raising these children's adult incomes relative to those of children born to poorer parents. Or perhaps wealthier parents transfer (inter vivos or via inheritance) land, money or other physical assets to their children, and this greater wealth leads directly to higher adult incomes. In the first scenario free education might level the playing field, while in the second scenario a more progressive inheritance tax system or a land redistribution policy might be appropriate. On the other hand, IGE may arise due to intrinsic heterogeneity correlated within families, such as ability, race, or social connections. In this situation, the policy implications are less clear. If transmission of ability drives IGE, we might deem outcomes unequal but equitable (Roemer, 2004). If transmission of race or social connections drives IGE, large-scale changes in societal structures may be necessary to improve economic mobility.

This paper estimates and then decomposes intergenerational income elasticity (IGE) for both sons and daughters in Bukidnon, Philippines. While initial estimates of IGE are similar for both sons and daughters, we find sharp gender differences in the pathways behind this transmission. While parent capital levels appear to explain the entirety of parent-to-son income transmission, parent income continues to exert a strong, significant influence on daughter income, even after controlling for parent characteristics. These findings suggest that while policies aimed at leveling parent capital levels, or decreasing the intergenerational transmission of capital, might decrease IGE for sons, they would be less effective in decreasing IGE for daughters. Parent-to-daughter income transmission appears to occur though a less easily observed channel, perhaps associated with the assortative marriage process.

This paper proceeds as follows. Section 2 contains background on the estimation of both intergenerational capital transmission and intergenerational income transmission.

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Section 3 outlines our conceptual model, which informs our reduced form econometric analysis. Section 4 provides an overview of the data. Section 5 explains our estimation techniques. Section 6 presents and discusses our results, and Section 7 concludes.

2. BACKGROUND

Most economists couch parent-to-child income transmission in terms of intergenerational income elasticity (IGE) estimates generated through regression of children's adult log income on their parents' log income. In naïve IGE equation 1, the log income of parents in household j is given by y_j, the log income of child i in household j is given by y_{ij}, and IGE is given by the estimated coefficient b_1.

$$y_{ij} = b_0 + b_1 y_j + e \quad (1)$$

Methods of estimating intergenerational income elasticity have improved steadily over time. Older studies of IGE in the US typically found IGE estimates of 0.2 or less (Solon, 2002), signaling considerable equality of opportunity. These estimates, however, often suffered from attenuation bias due to measurement error, and/or bias (ambiguously signed) due to age and lifecycle effects (Behrman & Taubman, 1990; Solon, 2002; Black & Devereux, 2011). Age and life cycle effects are generally corrected for by controlling quadratically for parent and child age (Black & Devereux, 2011). [1] Correcting for measurement error by averaging parent income across multiple years commonly increases IGE estimates to around 0.4 in the United Kingdom (UK) and US (Solon, 2002; Blanden, 2013), with lower estimates of around 0.1 – 0.2 in Canada and the Nordic countries of Europe (Corak & Heisz, 1999; Osterbacka, 2001; Solon, 2002).

It is possible, however, that most existing studies still under-estimate IGE due to the effects of transitory income and price shocks that generate temporary variation around permanent income. Unlike classical measurement error, error due to transitory shocks is likely to persist across time, and longer panels are thus required to mitigate the resulting attenuation bias on estimated income coefficients (Mazumder, 2005; Naschold & Barrett, 2011). For example, (Mazumder, 2005) shows that IGE estimates rose from 0.45 when averaging across seven years of US social security data to 0.61 when averaging across 16 years.

Studies of intergenerational income transmission have generally focused on a particular demographic: males in the developed world. The dearth of studies in developing countries is largely due to lack of reliable income data (Núñez & Miranda, 2011; Black & Devereux, 2011; Harper, Marcus, & Moore, 2003). However, the few studies that have investigated income transmission in developing countries usually find relatively high IGE rates (Solon, 2002; Blanden, 2013; Corak, 2004). Conversely, the few studies that have investigated parent to daughter IGE — in the developed world — have found comparably lower IGE rates for daughters than for sons (Chadwick & Solon, 2002; Jäntti et al., 2005). Raaum et al. (2007) provide a framework for understanding how IGE differs across sons and daughters, and attribute much of the difference to assortative marriage and labor supply response effects.

Once estimated, the crucial question is what generates these IGEs. A large body of economics and sociology research from the 1990s suggests that educational achievement is correlated within families and across generations (Thomas, 1996; Behrman, 1997; Behrman, Gaviria, & Székely, 2001). A second body of the economics, nutrition and public health literatures explores how parent education and parent health each influence the health outcomes of children (Thomas, Strauss, & Henriques, 1991; Thomas, 1994; Bhalotra & Rawlings, 2011). Given the income returns to both health and education, these human capital transmissions clearly play a role in underpinning IGE (Alburg 1998).

Similar to the method used in estimating IGE, economists often couch education transmission in terms of an estimated regression coefficient relating parental and child educational attainment measures. In the United States, for example, Behrman and Rosenzweig (2002) found median estimates of 0.12 years and 0.15 extra years of child schooling for every additional year of mothers' and fathers' schooling, respectively. Behrman and Rosenzweig (2002) found intergenerational education correlations of 0.5–0.7 in Latin America, and Thomas (1996) found correlations of 0.2–0.4 in South Africa, depending on race and parent gender. Relatively high rates of intergenerational schooling transmission in poorer countries may be due to low levels of parent education, poor macroeconomic conditions and to a lack of government investment in public education, all found to be significantly related to low levels of schooling mobility (Behrman & Rosenzweig, 2002; Corak & Heisz, 1999; Hertz et al., 2007).

Health transmission is more difficult to estimate than education transmission, given the multidimensional nature of health (Strauss & Thomas, 1998). Published estimates of parent-child lifespan correlation fall between 0.15 and 0.3 (Yashin & Anatoli, 1997). Eriksson, Bratsberg, and Raaum (2005) find an average parent-child morbidity correlation of a bit under 0.3. mothers' birth weight and nutritional status is clearly associated with child birth weight (Currie & Moretti, 2005; Victora et al., 2008; Black et al., 2008; and Bhalotra & Rawlings, 2011) find positive associations between maternal and child health over a range of indicators in 38 developing countries. Height is often considered the best single measure of adult health "stock," given that it captures health shocks from in utero through early adulthood (Thomas et al., 1991; Thomas, 1994). In the developing world especially, where stunting due to malnutrition and disease is widespread, height may be the most telling measure of accumulated health (Fogel, 2004; Costa, 1998; Dasgupta, 1997).

Cross-capital transmission between education and health is also well documented, the most common example being the impact of maternal education on child health. Thomas et al. (1991) find that maternal education positively affects child height-for-age, and that this association appears to work through access to information. Thomas (1994) finds that in three countries (Brazil, Ghana and the US) maternal education has a larger positive impact on daughters' height than on sons' height, while the opposite is true for paternal education. Aslam and Kingdon (2012) show that in Pakistan, father's education is a determinant of child immunization while mother's education, acting largely through an association with empowerment, is the best predictor for child weight-for-age.

Given the importance of land in agrarian societies, it seems likely that land transfer may also play a role in creating intergenerational income correlations in much of the developing world. For instance, a significant proportion of children in the rural Philippines receive a portion of their parents' land upon marriage or a parent's death, though this practice is declining as land becomes scarcer (Estudillo et al. 2001b). It seems clear that parents favor sons over daughters when transferring land to progeny, but in recent years favor daughters over sons when investing in education (Estudillo,