

## Effects of income earnings and remittances on education: some empirical results

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### Keywords

Earnings, Remittances, Education, Fiji

### Abstract

This paper evaluates the effects of disaggregated returns to education (primary, secondary, tertiary level) and remittances on educational attainment in Fiji using the household income and expenditure survey 2002-03 dataset. The effects of disaggregated returns to education are measured by household income quartiles utilising the quantile regression approach. Results indicate that all income-quartile households have higher returns to education through formal education. The highest level of benefits is for the lowest income quartile group by obtaining formal education. Findings for remittances on educational attainment show that remittances ease household's budget constraints on educational attainment. However, the impacts differ between urban-rural areas, ethnicity and gender between the Fijian and Indo-Fijian boys and girls. The findings indicate some implications.

### Introduction

A sustainable amount of community's wealth must be invested in education to realise a high economic value of education. Investment in educational attainment and in skill enhancement is a necessary component for human capital accumulation, which in turn leads to productivity improvements and economic growth (Becker, 1975). Education empowers people for a better standard of living, a rewarding life, and to engage in health practices and decision making on wellbeing that benefits both the individuals and society. The returns to education with higher levels of education, higher skill levels and knowledge lead to higher wages/income and fulfil better standard of living. The analysis between education and income earnings is crucial to policy makers to take actions to enhance growth and wellbeing, besides an understanding on returns to investment from the private returns perspective.

A significant increase in migration has led to higher remittances inflow which is another source of income to the households in developing countries. The official recorded remittances to developing countries is estimated at US\$404 billion in 2013, it is estimated to rise to \$516 billion in 2016 (World Bank, 2014a, 2014b). Remittances in many developing countries have exceeded their export revenues, foreign direct investment (FDI), foreign aid and other private capital flows. Besides permanent immigration the temporary worker programmes in many developed and developing countries provide opportunities to the sending nations in terms of economic, social and developmental benefits to individuals and the economy. Remittances highlight the changes in the household consumption and educational impact. An increase in individual's productivity and the level of income is realised with higher educational levels at the household level.

With considerable heterogeneity in the relative importance of educational development this paper evaluates the effects of disaggregated returns to education (primary, secondary and tertiary levels) and remittances on educational attainment using Fiji's Household Income and Expenditure Survey (HIES) 2002-03 dataset that includes 5,245 households. The effects of disaggregated returns to education are measured by household income quartiles utilising quantile regression approach. The second analysis for remittances-educational attainment nexus uses the ordinary least squares technique to control for household and location characteristics disaggregated by ethnicity (Fijian and Indo-Fijians), gender (boys and girls) and regions (urban and rural).

The Fiji government since 1971 has set its efforts to increase access to education via primary education at zero-fee tuition and some support at the secondary level since 2000. Fiji is amongst the top 10 countries in 2000 with the highest rate of tertiary educated emigrants in East Asia and the Pacific region. An increase in migration has led to significant remittances flow which is another source of income to the households. In monetary magnitude Fiji is one of the top 10 remittances recipients in East Asia-Pacific region (World Bank, 2008) whereby remittances is the second largest foreign exchange earner after tourism. Remittance flows are

from a number of countries that include Australia, New Zealand, United States, and off-shore labour markets (Gounder, 2007, Gounder and Prakash, 2009). Remittances over the last decade averaged around 5 percent as a share of Gross Domestic Product (GDP).

The household income used towards investment in human capital does not imply a causal relationship exist in many developing countries. The returns to education are estimated using income quartiles at different levels of education at the primary, secondary and tertiary levels. This is followed by if remittances have an effect on relaxing household budget constraints that keep children out of school. The analysis for remittances-educational attainment nexus is further categorised by ethnicity, gender and regional differences. The next section highlights a brief literature of returns to education and remittances-educational attainment nexus linking that in the context of Fiji. This is followed by models and empirical results with the conclusion that provide some implications for the returns to education and remittances for social financing for wellbeing.

## 2. The Effects Income Earnings and Remittances on Education

Education is not merely a consumption activity but is an investment that leads to the formation of human capital comparable to physical capital (Schultz, 1961). Educational investment leads to higher income and improved economic performance for developing countries. Remittances of a personal nature reflect family's welfare; asset accumulation and investment in home areas; repayment of loan for investment in education, migration costs; and savings in portfolio management.

The causal relationship between education and income earnings has been explored in the empirical literature of labour economics (see Card, 1999; Son, 2010). The analysis adopts education and growth perspectives where the private returns provide a measure of the return to investment in addition to schooling. The social impacts highlight that returns to education could give an indication of the relative scarcities experienced by people with different levels of education and provide a guide for educational policies (Psacharopoulos and Ng, 1994). Analysis of these relationships has used a variety of econometric tools on diverse data sets.

Remittance is a crucial external source of finance for the recipient households' wellbeing, Ratha also (2007) notes on the resiliency of remittances. It provides another way to finance investment and overcome liquidity constraints (Solimano, 2003; Carling, 2004; Guiliano and Ruiz-Arranz, 2009). Its impact on economic development has a first round impact on households that targets a range of consumption goods (i.e., food, durable and non-durable goods, education, health, housing, savings, small-medium scale business investment, asset holdings, debt redemption, livelihood activities, see Acosta, Fajnzylber and Lopez, 2008; Adam and Page, 2005; Gounder, 2015). Changes in consumption allow the households to improve their standard of living and earn a higher income for long term development of the household (Córdova, 2005). He finds that in the case of Mexico remittances are associated with lower illiteracy among children. In an analysis for the group of Latin American countries Acosta, Calderón, Fajnzylber and López (2008) note that remittances could have a larger effect in reducing budget constraints that keep children out of school.

## 3. Econometric Framework: Remittances and Education Nexus Results

The empirical evaluation on the returns to education is based on Mincer wage equation. The remittances-educational attainment analysis follows the Latin American study by Acosta et al., (2008) based on the survey data to estimate the models in the case of Fiji. The sections below present model specifications, and a discussion on the data, methodology and results.

### Empirical Models and Methodology

The Mincer's (1974) wage function provides the underlying model estimation to estimate the returns to education using the actual income of the household. The model is extended to control for a number of other factors related to personal household characteristics rather than just the schooling factors. The estimated specification shows the impact of household head's completed years of schooling (i.e., primary, secondary, tertiary level of education). The model is as follows:

$$\ln THAI_i = \alpha_0 + \alpha_1 PRIM + \alpha_2 SEC + \alpha_3 TER + \alpha_4 Age_i + \alpha_5 Age_i^2 + \alpha_6 Female_i + \alpha_7 Ethnicity_i + \alpha_8 Children_i + \alpha_9 Rural_i + u_i \quad (1)$$

where  $\ln THAI$  is logarithm of total household annual income;  $School$  is the household head's completed years of schooling;  $Age$  is the age of household head;  $Age^2$  is squared of the household head's age;  $Female$  is dummy variable that represents the female household head;  $Ethnicity$  takes value of 1 if the household head is Indo-Fijian and 0 if Fijian;  $Children$  is number of children in the household (those 14 years of age or under);

*Rural* is the households in rural areas; *PRIM* is the household head with primary education (1-8 years); *SEC* is the household head with secondary education (9-13 years); *TER* is the household head with tertiary education (>13 years);  $u_{1i}$ , is the random error term; and  $i$  is  $1, \dots, N$ , households.

The dependent variable in equation (1) is total household income rather than individual's wages seen in Mincer's wage equation to avoid the potential biases and omitted variables (Gujarati, 1995; Stanovnik, 1997; Wooldridge 2003). Incorporating appropriate variables identify the effects from unobserved factors (i.e., ability, family background or exogenous influences on schooling decisions) besides the household-community characteristics to avoid measurement errors (Blackburn and Neumark, 1992; Hernstein and Murray, 1994). The model is extended to control for a number of other factors related to personal household characteristics. Fiji's income information for each household is available not only based exclusively by labour income of the individuals but also by other income to the household as a whole (Narsey, 2006). Other issues taken into consideration is to avoid downward biased estimator of the true return (i.e., individual's years of schooling, expected earnings of the person, current earnings may dominate future earnings, the household may choose to reduce schooling when labour market prospects are buoyant). The endogeneity issue is overcome by using instrumental variables for schooling (Zuluaga, 2007).

Following Zuluaga (2007) the exogenous variations of individuals schooling attendance are utilised. The first instrumental variable tuition-free primary education introduced in 1973 identifies the exogenous influences on schooling decisions from free primary education. The second instrumental variable captures schooling of young parenthood impact to identify individuals that have become head of households before reaching the age at which secondary school is normally culminated. The third instrumental variable reflects school attendance impact of head of household due to his/her physical/mental under-privilege, as they are more likely to lack access to employment and education.

The specification for remittances-educational attainment relationship is estimated for children beyond class 8, aged between 14 and 17 years as primary school education is free up to Class 8. As such, remittances can significantly affect children's high school attainment; based on the models by Acosta et al., (2008). The models also assess the impact by ethnicity, gender and regions, as follows:

$$E_i = \alpha + \beta X_i + \gamma M_i + \lambda C_i + \delta R_i + \varepsilon_i \quad (2)$$

where  $E_i$  represents the number of children beyond Class 8 (primary education) completed by child  $i$  aged between 14 and 17 years.  $X_i$  is a vector of child and household characteristics, i.e., age of the child, infant, young child between 6 and 10 years, family home ownership, welfare assistance received by the household, income quintile to which the household pertains to, household income per adult equivalence.  $M_i$  is a set of characteristics of child's mother, i.e., education attainment, mother's marital status, and a quartic form of mother's age.  $C_i$  represents the community characteristics, i.e., proportion of households with sanitary services, proportion of household heads in the agricultural activities and remoteness (to the main city centre where the household is located).  $R_i$  is a dummy variable for households that receive remittances, and  $\varepsilon_i$  is the random error term.

Fiji's HIES 2002-03 dataset indicates social and economic indicators for 5,245 households. The survey methodology conducted by the Fiji Islands Bureau of Statistics has a two-stage sampling strategy with representative samples of Urban and Rural Enumeration Areas (EA) for all household information (Fiji Islands Bureau of Statistics, 2008). Summary statistics by household are presented by ethnicity, regions and gender in the Appendix Table A1.

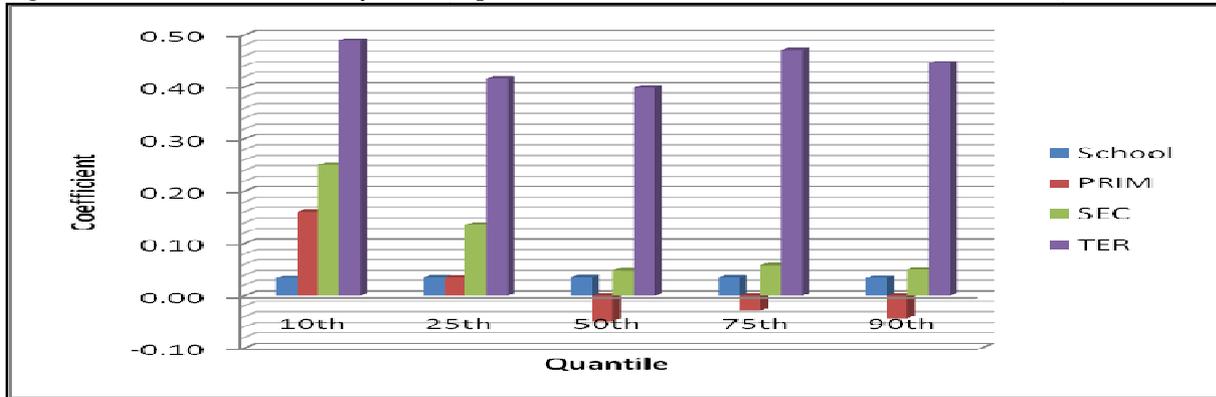
### Returns to Education Results

The estimated results on the rate of returns to education by income quartiles presented in Figure 1 illustrate the comparison of earnings by levels of education, i.e., primary (PRIM) secondary (SEC), tertiary (TEC). The returns from *PRIM* and *SEC* educational levels have substantially lower impacts on earnings at higher income quartiles. In particular, the returns to *PRIM* education became statistically insignificant and negative after the 25<sup>th</sup> quartile onward. The *TER* educational impact on earnings is significantly higher than the returns to *SEC* and *PRIM* levels for all income quartiles.

The results suggests that primary education is the initial stage for lifting the poorest people out of poverty but it cannot sustainably prevent people with primary education falling into poverty. This is particularly more in

the circumstances of unforeseen events like natural disasters, political instability and global economic crisis that Fiji has experienced over time that has reduced the capacity for income earning opportunities of those with lower educational levels. Higher years of schooling and higher educational levels are crucial to improve the standard of living.

**Figure 1** Returns to education by income quartiles



**Remittances-Educational Attainment Results**

The estimated coefficients reported in Table 1 by ethnicity, gender and region show the impact of remittances on educational attainment are in the context of the base model that control for household and location characteristics. The regression estimates for each category are shown by  $\delta$  coefficient (eq. 2). Access to remittances is positive and significantly associated with All Children higher educational attainment in Fiji. It suggests that remittance has a positive impact on relaxing household budget constraints that keep children out of school (see also Brown, Connell, Jimenez and Leeves, 2006). The estimated positively significant coefficients confirm that remittances contribute to educational attainment for All Boys and All Girls at the one and ten percent levels, respectively.

Understanding the impact of remittances on educational attainment shown by ethnicity and gender in the next set of results indicate that All Fijian Boys and All Fijian Girls have higher educational attainment at 0.23 and 0.20 percent, respectively. A significant outcome for the Boys category captures the societal values of the decision to educate the boys and remittances are used more in a productive way given the male migrant member may direct remittances to educating other male member(s) for future migration. While All Fijian Girls coefficient has a weak positive link, it infers that remittances support their schooling in these recipient households. It implies the change in values for girls’ higher schooling. The increase in demand for nurses and caregivers also support the finding that remittances are used productively for girls’ education with an intention of producing future female migrants. In the case of All Indo-Fijian Boys and Indo-Fijian Girls the estimated coefficients are positive but insignificant, thus remittances do not significantly reduce household budget constraints that keep children out of school for the Indo-Fijian households.

The results for All Urban and All Rural Children indicate positive and significant impacts; as such remittances allow children in both regions to attain higher schooling. However, in terms of ethnicities by region it has differential impacts. The All Rural Fijian coefficient is positive and significant at one percent level supporting higher educational attainment in rural areas but the children in Urban Fijian households face budget constraints affecting children out of school. The findings for rural areas suggest that there is a significantly large number of military, sports and security personal, nurses and caregivers who may be remitting a higher magnitude to the families in rural areas. For Urban Indo-Fijian category these children attain higher levels of education compared to Rural Indo-Fijian children. The negatively insignificant coefficient for Rural Indo-Fijian children suggest that these households face budget constraints that adversely affect by keeping the children out of school.

**Table 1** Remittances-Educational Impact Results by Categories, Fiji

Dependent variable: education attainment > Class 8 of children aged between 14 and 17 years		All children (n=2239)	0.36(3.89)***
All Boys	0.18(1.84)*	All Girls	0.17(1.81)*
All Fijian Boys	0.23(1.71)*	All Fijian Girls	0.20 (1.58)

All Indo-Fijian Boys	0.21(1.29)	All Indo-Fijian Girls	0.15(0.99)
All Urban Children	0.34 (2.65)***	All Rural Children	0.31 (2.37)**
Fijian	0.15(0.85)	Fijian	0.57 (3.26)***
Indo-Fijian	0.56(2.75)***	Indo-Fijian	-0.13(-0.63)
All Urban Boys	0.20 (1.50)	All Rural Boys	0.18 (1.21)
Fijian Boys	0.20 (1.01)	Fijian Boys	0.27(1.46)
Indo-Fijian Boys	0.28(1.35)	Indo-Fijian Boys	0.03(0.13)
All Urban Girls	0.25 (1.85)*	All Rural Girls	0.08 (0.60)
Fijian	0.26(1.39)	Fijian	0.17(0.97)
Indo-Fijian	0.37(1.69)*	Indo-Fijian	-0.12(-0.53)

Notes: Other variables used in the estimation include Decile, children age 0-5years, children age 6-10years, Sanitation, Homeownership, Agriculture, Remoteness\_prov, Mother\_edu, Avgedu\_adults, HH-income\_pae, Welfare\_pae. \*\*\*, \*\*, \* significant at 1%, 5%, 10% level, respectively.

The estimated coefficients for All Urban Boys and All Rural Boys are positive but not significant at the conventional levels. By ethnicity, both Fijian Boys and Indo-Fijian Boys in Urban and Rural regions establish positive links between remittances and higher schooling but the coefficients are not significant at the conventional level. Remittance coefficients are positive for Rural Fijian Boys and Girls; however the magnitude of Rural Fijian Girls coefficient is much lower (0.17) compared to Rural Fijian Boys (0.27). As for All Urban and Rural Girls the impact of remittances is positively significant on All Urban Girls educational attainment but the relationship for All Rural Girls though positive is insignificant. Comparing that by ethnicity for All Urban Girls remittances has a positively significant contribution for Urban Indo-Fijian Girls; hence remittances contribute to their educational attainment. This outcome reflects their access to remittances that significantly reduce household budget constraints that keep children out of school compared to the result of negatively insignificant impact for Rural Indo-Fijian Girls.

## Conclusion

This study evaluates the returns to education and remittances-educational attainment in the case of Fiji. Understanding the impact of returns to education by income quartile groups provide the education-income nexus and its returns to education by various level. The disaggregated impact of remittances by ethnicity, gender and regions provide the importance of remittances as another source of income to contribute to higher educational attainment for the households' socio-economic development. In particular the socio-economic innovations are vital to build developing nations capacity for higher growth and individuals' wellbeing. A significant impact of returns to education and the positive impacts of remittances show significant increase in educational attainment in Fiji.

The quartile effects for distributional function of the household income show that returns to education vary between the lowest and upper tails of income groups. Thus, people benefit from additional skills obtained through formal education for all income quartiles. The benefits are highest for the lowest income quartile group from obtaining formal education to that of higher income quartile groups. This suggests that primary education is the initial stage for lifting the poorest people out of poverty, but it cannot sustainably prevent them falling into poverty when unforeseen events occur. Notably, primary education after 25<sup>th</sup> income quartile cannot meet the demands of providing all the basic needs and health improvement.

Remittances and its impact on development have received increasing importance given its large flows and its use for recipient households' wellbeing. Fiji's migration pattern shows an upsurge in remittances that provide a robust path for growth and development. The econometric results for remittances impact on schooling suggest that remittances induce educational attainment, however the effects differ by ethnicity between the Fijian and Indo-Fijian households, gender differential impact between Fijian and Indo-Fijian boys and girls and between urban and rural areas. The overall impact of remittances on children schooling is positive and significant. Specific disaggregated impacts by gender support that both Fijian Boys and Girls have higher educational attainment while the Indo-Fijians' impact is positive and insignificant. Both rural Fijian Boys and Girls increase their educational attainment, but this is not the case for Rural Indo-Fijian households. The rural Fijian communities close links with the families reduce budget constraints whereas the cultural values over boys' education remain a priority amongst the Indo-Fijian families in rural areas.

As higher educational levels enhance the possibilities for individuals to attain formal employment, it also avoids poverty situations. Access to urban-rural infrastructure and social services, i.e. Higher education and training, are important to reduce the chances of falling into poverty cycle for low income households. Strategic investments in all levels of education can contribute to an increase in economic opportunities and enlarge peoples' social and economic outcomes. Government resources, returns to higher education and access to remittances for educational attainment can advance sustainable development goals. Policies should be aimed at removing barriers to higher schooling and retention, low-income families to pursue higher learning, employment-related training and professional education for poor urban-rural households.

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#### Appendix Table 1 Households Structures: Remittance & Educational Characteristics

Total Number of Households 5245					
Remittance Recipient Households			Non-Remittance Recipient Households		
All Fijians	429			2043	
All Indo-Fijians	405			2100	
Others	48			220	
<u>Remittance Recipient Households Percentage</u>			<u>Non-Remittance Recipient Households Percentage</u>		
Total No. of Households	882	16.8	Total	4363	83.2
Urban	398	45.1	Urban	2617	60.1
Fijian	148	16.8	Fijian	990	22.7
Indo-Fijian	221	25.0	Indo-Fijian	1438	33.0
Others	29	3.3	Others	189	4.3
Rural	484	54.9	Rural	1746	40.0
Fijian	281	31.9	Fijian	1053	24.1
Indo-Fijian	184	20.9	Indo-Fijian	662	15.2
Others	19	2.1	Others	31	0.7
Total Number of Children Aged 14 to 17 years: 2239; No of children between 14 to 17 years > class 8: 1880					
<u>Number of Children</u>		<u>Percentage</u>	<u>Number of Children</u>		<u>Percentage</u>
All Boys	917	48.8	All Girls	963	51.2
Fijians	484	52.8	Fijian	491	50.9
Indo-Fijians	383	41.8	Indo-Fijians	424	44.1
Others	50	5.5	Others	48	5.0
All Urban Children	1302	58.2	All Rural Children	937	41.8
Fijians	627	48.2	Fijians	555	51.8
Indo-Fijians	592	45.5	Indo-Fijians	356	38.0
Others	83	6.4	Others	26	2.8

Source: Author's calculations based on HIES 2002/03 dataset.