Male migration and Women empowerment: The Case of Samoa

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Abstract

Women are crucial in many economic activities, child-rearing, and managing household chores. They provide essential but more often unrecognized work. Male outmigration creates space for women to enhance their intrahousehold bargaining power, relaxing their financial constraints by sending remittances but can also leave more burden for women in taking care of children and house works. Migration is a key economic feature in Samoa with remittances exceeding 30 per cent of GDP in 2021. Various social impacts of migration on left-behind family members are well examined in the literature. However, the impact of male migration on women's empowerment and employment in Pacific island countries in general, and in Samoa, in particular, is relatively unknown. This study examines the impact of husband migration on women's employment and empowerment by using the Multiple Indicators Cluster Survey 6 for Samoa in 2019. The main estimation strategy is based on logit regression and propensity score matching based on Mahalanobis matching technique. Our primary findings shows that married women in households with husband migrants are more likely to have control over household income, have the final say on family health issues, make decisions on major and daily household purchases, visit relatives, and decide on the use of contraception. The study finds no relationship between husband migration with women employment. Our results suggest that policies promoting women's entrepreneurship and decision-making would contribute to their empowerment and employability.

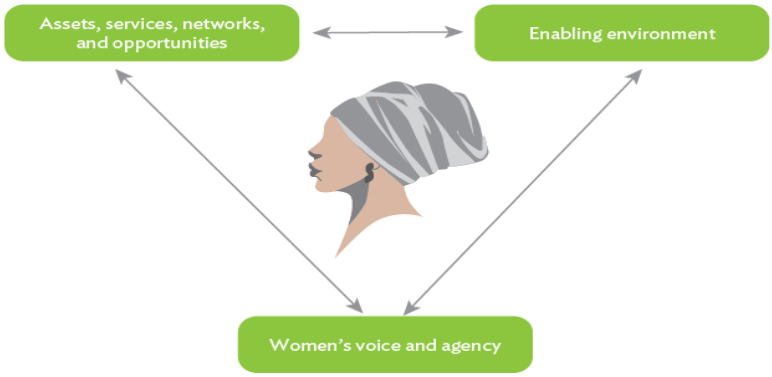
JEL: J16, O12

Keywords: migration, women empowerment, Samoa, Pacific Island Economies.

1. Introduction

Women play important roles in many economic activities, child-rearing, and household management. They provide essential but more often unrecognized and unpaid work. *Women's economic empowerment* refers to their ability to thrive, progress and succeed economically, as well as their power to make and implement economic choices that improve their well-being and status within society (Calder et al. 2020). There are three domains for women's economic empowerment as shown in **Figure 1**: (1) *Women's access to economic assets, services, networks, and opportunities*: access to and control over financial, physical, technological, and knowledge-based assets, networks, services, and opportunities, including access to capital, training and mentoring, business opportunities, and markets; (2) *Enabling environment*: policies, laws, legislation, rules and regulations at the market and state level, and norms—exercised primarily at the household or family and community levels but also present in formal institutions—that mediate women's access to and control over economic assets within their household, businesses, community, and local economy; and (3) *Women's voice and agency*: individual capabilities, sense of entitlement, self-esteem, and self-belief to make economic decisions, and the ability to organize with others to enhance economic activity and rights.

Figure 1: Women's Economic empowerment



Source: Hearle et al. (2020)

Migration is a key economic feature in many Pacific Island countries. Samoa, a Polynesian archipelagic country, is the second largest recipient of remittances (after Fiji) in the Pacific, receiving approximately US $200 million in 2019. The country is also consistently among the top seven Asia-Pacific countries with the highest remittance inflows (more than 25 per cent of GDP in 2021). Husband migration opens opportunities for women to strengthen their

influence in the household. This can happen when women become the head of the household or improve their position relative to other household members. Additionally, the financial support provided by husbands through remittances can have a positive impact on women's lives, as it eases their financial limitations and enables them to make significant and well-thought-out decisions about their future[1].

On the other hand, male outmigration can affect women's employment negatively due to the income effect of remittances on women's labor force participation, but it increases self-employment (Funkhouser, 1992; Amuedo-Dorantes and Pozo, 2006; Yang, 2008; Binzel and Assaad, 2011). Male emigration can increase the sphere of women's decision-making and control over resources, but it may also place additional burden on their time, thereby restricting their agency (Kaspar 2005; Maharjan et al., 2012; Sijapati et al., 2017). As surveyed in Blundell and MaCurdy (1999), married women in Nepal make labor supply decisions in the context of the family (Lokshin and Glinskaya, 2009). Remittances would pull them out of the formal labor market. However, women left behind are also expected to provide labor for the family business or farm to fill the gap created by the absence of male household members (Binzel & Assaad, 2011; Lokshin & Glinskaya, 2009; Mendola & Carletto, 2012; Mu & Van de Walle, 2011). Men's outmigration can lead to increased work burdens for the women who stay at home. Higher work burdens can be disempowering, limiting the capacity to make a full range of choices, and with harmful effects on their health. In Vietnam, women's workload increased as they had to take all the management decisions on the farm and also do activities which were traditionally done by their husbands such as irrigation, dredging field canals, applying fertilizer and pesticides and taking the output to the market (Paris et al., 2010). Higher workloads may accompany greater autonomy and responsibility, as Yabiku, Agadjanian, and Sevoyan (2010) find in Mozambique. This suggests that there may be trade-offs among the different domains of empowerment.

Numerous studies have explored the effects of male outmigration on women's empowerment, and the findings have been diverse and inconclusive. Many studies find significant gains in women's decision-making autonomy following the migration of male family members in across a range of country contexts including Bangladesh (Hadi, 2001), Morocco

[1] Women's ability to make meaningful and strategic choices is identified as an important factor constituting women's empowerment (Alsop et al, 2006; Kabeer, 2001; Klugman et al, 2014; Malhorta et al, 2002; Sen, 1999).

(Sadiqi & Ennaji, 2004), Mozambique (Yabiku et al., 2010), Guatemala (Stanley, 2015), and countries in Southeast Asia (Paris et al., 2010). Stanley (2015) found that male outmigration improves women's agricultural agency in Guatemala because these women assume the role of hiring and managing workers. A similar positive effect on women's decision-making was also observed in the state of Uttar Pradesh in India (Paris et al., 2005), in Bangladesh (Debnath and Selim, 2009), and in Nepal (Maharjan, Bauer and Kneer, 2012; Kar et al, 2018). A positive impact of household migration on women's increased self-employment and farm activities is also reported by Mendola and Carletto (2012), Stanley (2015), and Mu and van de Walle (2011). Other studies, however, do not find compelling evidence of such gains, including research from Armenia and Guatemala (Menjívar & Agadjanian, 2007), México (Radel & Schmook, 2009), and China (Mu & Van de Walle, 2011). Sinha, Jha and Negi (2012) found no significant relationship in India and the burden on women increased in Morocco (de Hass and Rooij, 2010). Lokshin and Glinskaya (2009) found a negative impact on the level of labor market participation among women in migrant-sending households, and Slavchevska et al. (2016) showed that women were increasingly compensating for the lost labor hours in agriculture, leading to the 'feminization of agriculture'.

However, there have been no empirical studies on the topic in the context of Pacific Island countries, in general, and Samoa, in particular, despite the high migration rate in the country. Samoa is committed to promoting women's empowerment and gender equality in all aspects of life[2]. Despite the progress, there remain a number of challenges that continue to impede the full realization of gender equality such as people's continued adherence to harmful social norms toward women (UNICEF, 2019). Given the backdrop, it is important to learn more about women empowerment, especially when men are away from home. This study examines the impact of husband migration on women's employment and empowerment by using the Multiple Indicators Cluster Survey (MICS) 6 for Samoa in 2019.

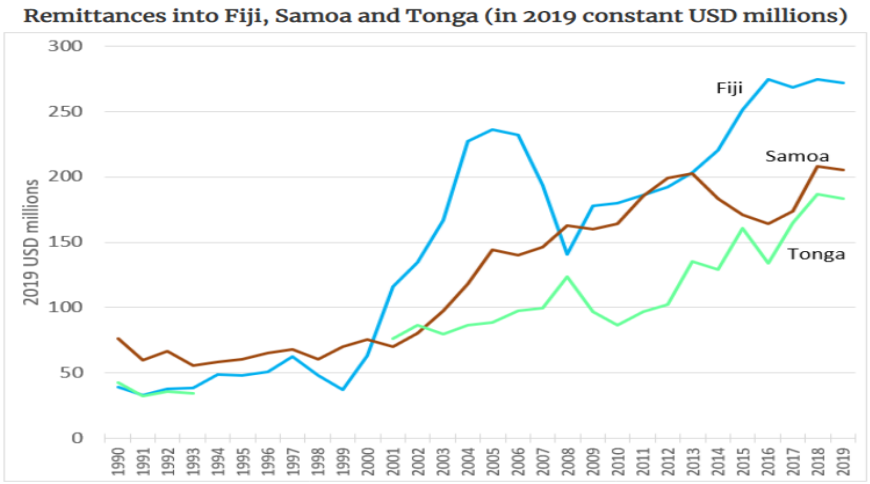
The paper is structured as follows. Section 2 provides background of migration and women empowerment in Samoa. Section 3 introduces the data we use in the analysis. Section 4 outlines the empirical strategy and results. Section 5 concludes.

[2] The most notable is the introduction of an amendment to the constitution guaranteeing a minimum of 10 percent of seats for women in the Parliament. Legislative measures have been passed such as mandating the use of gender-neutral language in all legislations (UNICEF, 2019).

2. Overview of migration and women empowerment in Samoa and Pacific Island countries

Samoa is a Polynesian archipelagic country in the South Pacific Ocean with a population of above 200,000 people(Samoa Bureau of Statistics, 2016). The majority of the population resides on the two largest islands, namely Upolu and Savai'i. The Samoan economy is dependent on agricultural exports, tourism, and capital flows from abroad. Main industries include timber, tourism, food processing and fishing. Migration has become an important livelihood strategy in Samoa when the country is located in a remote area and so, there is a vast distance between them and larger markets and natural resources (Gibson, 2007). Migration is also a way of coping with the effects of climate change and disaster risks [3] such as incremental sea-level rise, saltwater intrusion, and drought. Given high migration rate, a significant part of the Samoan household's income come from remittances from working in other regions or overseas, most of the time in New Zealand, Australia, or the United States (Stewart-Withers, 2011).

Figure 2: Remittances into Samoa compared to other countries.



Source: https://devpolicy.org/the-pacific-remittances-boom-its-for-real-20201105/

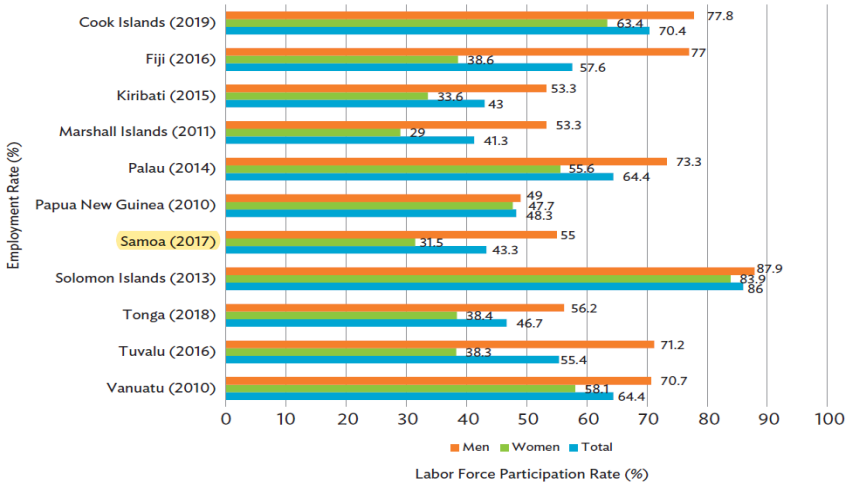
The country is the second largest recipients of remittances (after Fiji), experience inflows of approximately US $200 million in 2019 (**Figure 2**). And Samoa is among top 7 Asia-Pacific

[3] Countries with legislative and/or regulatory provisions been made for managing disaster risk: Fiji, Samoa and Tonga in 2015; and Kiribati and Tuvalu in 2020. (Pacific Data hub: https://stats.pacificdata.org/vis?lc=en&df[ds]=SPC2&df[id]=DF_SDG_13&df[ag]=SPC&df[vs]=3.0&pd=2015%2C2020&dq=A..TV%2BTO%2BWS%2BKI%2BFJ.....&ly[rw]=GEO_PICT&ly[cl]=TIME_PERIOD&ly[rs]=INDICATOR)

countries with the highest remittance inflows as a share of GDP in 2020, with remittance inflows accounting for nearly 30 per cent of GDP in 2021[4].

Figure 3 presents female and male employment rates in Samoa in comparison with other countries in Pacific islands. Women are less likely to be in the labor force than men with women's labor force participation is generally low at 34% in Samoa. Besides, there are high levels of occupational concentration by sex, and gender pay gaps. Labor force participation is more than 20 percentage points lower for women in Samoa compared to men (ILO 2021b). This is despite most countries having close-to-gender parity in primary and secondary school enrollment. Moreover, women with disabilities face additional barriers to accessing jobs, due to perceptions around their capacity to carry out paid work (ADB, 2023). Working conditions are often poor, where women are at risk of sexual harassment and abuse and have limited opportunities for collective bargaining. As a result, women are susceptible to live in poverty (ILO, 2014).

Figure 3: Female and Male Employment Rates Across Pacific Island Countries



Source: ADB (2023)

Women's entrepreneurship is common in the Pacific region in general and in Samoa particularly, and significantly higher than in developing Asia. However, female ownership remains most prevalent in family-run, smaller, and informal firms. In Samoa, women-owned

[4] The Global economy.com https://www.theglobaleconomy.com/Samoa/remittances_percent_GDP/#:~:text=Remittances%20as%20percent%20of%20GDP&text=For%20that%20indicator%2C%20we%20provide,from%202021%20is%2029.44%20percent.

micro, small, and medium-sized enterprises (MSMEs) in the informal sector account for approximately 97.4% of such businesses. According to ADB (2023), women remain in the informal economy for social and economic reasons, such as difficulties in accessing opportunities and markets due to geographical remoteness and lack of infrastructure, avoiding the demands of family and community for money. IFC (2016) reports that in Samoa despite women having higher levels of education than men, they still predominate in the industries that experience intense competition and generate lower returns, especially in the small-scale, home-based work in fish marketing, handicrafts, retail, and tourism sectors. There is also evidence that women in Samoa are increasingly setting up their own businesses and becoming entrepreneurs (FAO, 2019). As agriculture moves toward being more market-driven, women in remote areas are seen to be the ones attending training to learn basic business skills.

There are wide-ranging set of barriers that impede women's economic empowerment in Samoa. The foundation of the Samoan society is *Fa'a (*'the Samoan way') that defines values and behaviors in everyday life. The Samoan way includes three main elements, namely the *matai* (family and village chiefs), the *aiga* (the kinship group or extended family), and the Christian church. The highest position within the family is held by the matai, followed by the matai's spouse. In contrast, women who enter a village and family through marriage find themselves at the lower end of the social hierarchy and are referred to as *nofotane* (Stewart-Withers, 2011). These women do not enjoy the same rights and status as those who are native to the village. Furthermore, traditional matai titles are intertwined with the accumulation of land, following a concept that associates greater land ownership with larger extended families, resulting in more titles, and increased power and influence. Communal coexistence is emphasized in the *Samoan way*, highlighting the significant role of respect and responsibility towards the family, as well as the village and community. The *aiga* refers to the fact that several family members living in the same village or household, taking care of and looking after each other. It is common that couples, their children, and some in-laws share the same roof. All Samoans must contribute and be of service to the collective welfare of the aiga and in many cases, the *aiga* and the family duties come before any other priorities in daily life. Irrespective of age or gender, individuals who hold income-generating occupations commonly allocate their earnings to the matai, who then distributes the funds among the members of the aiga (extended family) and to the church (Kalara et al., 2022). Social norms indicates that women often find themselves juggle both paid and

unpaid caregiving duties, which can limit their mobility and productivity and confine them to lower incomes. They are largely not expected to become successful in business. There is still a prevailing absence of an entrepreneurial culture that supports and encourages women's business ventures in Samoa (IFC 2010; IFC 2016; Upadhyaya and Rosa 2019). In remote areas, women do not usually receive community support for formal business development as it is perceived as diminishing their ability to fulfill family and social obligations (UNESCAP 2020b). A concept in Samoa is *fa'alavelave* ("*an interruption*"), which is a traditional ceremony where large amounts of money, food, and fine mats are accumulated, pooled, exchanged, and redistributed between kin-groups. Many women feel a disproportionate burden because these obligations require significant time and resources (Women's World Banking 2013 cited in UNESCAP 2020a). Women are also often not recognized for their contributions. Additionally, many women also have lower business literacy and skills and access to information than men (Hedditch and Manuel 2010a; ADB 2015; IFC 2016; FAO 2019). Mobile internet penetration in Samoa increased from 41% of the population in 2013 to 88% in 2018; however, the proportion of private homes with access to mobile phones is higher among households headed by men than households headed by women (Government of Samoa 2020; UNFPA Pacific 2020). In addition, access to mobile banking is limited; only 3.7% of mobile phone owners had a mobile money account in 2015 (ADB 2018 cited in UNESCAP 2020a).

3. Data

This study examines the impact of husband migration on women's employment and empowerment by using the MICS 6 for Samoa in 2019-2020. Sample size includes 2,137 married women, not including women who are divorced/separated. The survey has a separate module on women empowerment and detailed demographic information of men and women aged 14-49. Male migration is identified by the fact that husband does not live at home, either living abroad or in another region within the country. We look at three main employment-related indicators, specifically married women's type of employment: whether woman is employer, employee or self-employed; We focus on the following indicators to measure women empowerment: control over use of household income, freedom in making decisions about her own healthcare, major household purchases, daily household purchases and visit relatives; and contraception use.

Table 1 presents summary statistics of main variables used in the study. Nearly 10% of married women were living in household with migrant husband. About 5% of sample women has husband living abroad and 4% living in another region in the country. 70% of the women completed secondary school. The average household size is 8. And more than 70% of the sample live in rural areas.

Table 1: Summary statistics

	Mean	SD
Husband outmigration	0.09	.287
Husband abroad	0.048	.215
Husband in another region	0.043	.203
Age of woman	34.709	8.145
Women education, secondary school	70.71	0.46
Household size	8.989	4.42
Number of children a woman has	2.881	1.6
Child under 5 years lives in household	8.989	4.42
Child aged 5-18 years lives in household	8.989	4.42
Rural area	0.733	.443

We compare the sample of women in household with a current migrant husband with women living with husband with respect to household characteristics, employment and empowerment outcomes in **Table 2**. Some significant differences emerge. Some main characteristics of migrants such as young age, low education level and coming from rural areas, mentioned in literature (Gibson et al., 2011, 2014), can be seen from the sample data. For women

with migrant husband, their migrant husbands are younger on average than non-migrant (20 years old versus 23 years old).

Table 2: Characteristics of women with non-migrant husband and with migrant husband

	(1) Non-migrant	(2) With migrant husband	Difference
Variable	**Mean/(SE)**	**Mean/(SE)**	**(1)-(2)**
Household characteristics			
Number of children women	2.902	2.661	0.241**
	(0.037)	(0.097)	
Number of adult women in household	0.383	0.146	0.237**
	(0.033)	(0.062)	
Number of adult men in household	0.383	0.146	0.237**
	(0.033)	(0.062)	
Age of husband	22.310	20.552	1.758**
	(0.219)	(0.691)	
Husband education, secondary school	0.606	0.036	0.569***
	(0.011)	(0.014)	
Rural area	0.727	0.797	-0.070**
	(0.010)	(0.029)	
Wealth score	-0.134	-0.183	0.049
	(0.022)	(0.061)	
Relationship to household head			
Household head	0.017	0.172	-0.155***
	(0.003)	(0.027)	
Daughter	0.233	0.536	-0.303***
	(0.010)	(0.036)	
Daughter-in-law	0.187	0.099	0.088***
	(0.009)	(0.022)	
Empowerment outcomes			
Self-employed	0.022	0.026	-0.004
	(0.003)	(0.012)	
Control over household income	0.234	0.417	-0.183***
	(0.010)	(0.036)	
Make decision about own healthcare	0.249	0.365	-0.115***
	(0.010)	(0.035)	
Make decisions for major household purchases	0.091	0.208	-0.117***
	(0.007)	(0.029)	
Make decisions for daily household purchases	0.287	0.406	-0.119***
	(0.010)	(0.036)	
Make decisions for visiting relatives	0.142	0.271	-0.129***
	(0.008)	(0.032)	

Decide to use contraception, wife=1	0.136	0.245	-0.108***
	(0.008)	(0.031)	
N	**1935**	**192**	

In addition, education levels are extremely low among husbands who migrate. Sixty percent of non-migrant husbands have completed secondary school while only 4 percent migrant husbands completed this education level. Also, more women with migrant husbands come from rural area. Women, whose husbands migrate, live in households with smaller number of children, adult women and adult men. More than half of women live with biological mother/father when their husbands migrate, compared to about 20 percent of women living with husbands. Significantly, there are more women with migrant husbands who are household heads than women living with husbands (17 percent versus 2 percent). Nearly 20% of married women with non-migrant husbands living with their parent-in-law, compared with 9% of married women with migrant husband. In terms of empowerment outcomes, across most of measures, women whose husband migrate are significantly more likely to have control over household income; make decisions about own health care; make decisions on major and daily household purchases, visit blood relatives and use of contraception.

4. Empirical methodology

4.1. Empirical strategy

To examine the relationship between husband migration and women employment and empowerment outcomes, we estimate the following regression in Equation (1):

$$Y_{ih} = \beta_0 + \beta_1 M_{ih} + \theta X_{ih} + \varepsilon_{ih} \qquad (1)$$

where Y_{ih} is an outcome variable for woman *i* in household *h*. Outcome variables are binary, including outcomes for women employment and women empowerment. M_{ih} is dummy variable, indicating that women *i* is living in household *h* with husband migrant at the time of the survey. X_{ih} is a set of control variables, consisting of the characteristics of women (age, education, numbers of children, religion and relationship to household head, years of marriage fixed effect), her husband (age, education), and household (household size, numbers of adult

female, adult male, children under five and children aged 5-14, land ownership, wealth, and whether the household living in rural area). ε_{ih} is the error term.

Husband migration could be endogenous, and so addressing endogeneity when measuring the impacts of women's empowerment is necessary to separate the impacts of migration from the decision to migrate. First, omitted variable bias could confound estimates due to unobserved individual-level characteristics or local economic conditions. More assertive women have higher bargaining power (Brown 2009) concerning the kind of job they will take after marriage and whether any member of the household should migrate, contingent upon household budgetary needs. This can lead to underestimated findings. On the other hand, the prospect of deteriorating local economic conditions could increase the likelihood of outmigration and affect the available job opportunities in the local market. In this case, the results showing a positive impact of husband outmigration on the likelihood that women work for family members rather than other employers would be overestimated. Second, reverse causality could happen if women's decision-making power over household resources affects the probability that their husbands migrate (underestimated results). For instance, Nobles and McKelvey (2015) found that in Mexico, an exogenous positive shock to women's decision-making over household resources decreased the probability that her husband migrated to the US. Or in the context of Nepal or India, this kind of shock could be substantial transfer of assets or large dowry payment by women's family in her name.

In order to address endogeneity issues, we apply the propensity score matching (PSM) approach. The PSM coefficients are estimated using a logit model that represents the average difference in the outcome variables between treatment and control groups, over a common support, weighted by the propensity score distribution of the subjects. The covariates for matching are selected so that they influence migration decision and women's empowerment status. In other words, the variables that determine the assignment of treatment but are unaffected by migration (Fakir and Naveen, 2020). Women with migrant husbands are matched with women living with husbands based on propensity scores generated from the following covariates: women age, women education, husband's age, husband's education, household size, number of children, living with mother in-law and/or father in-law, living in rural area, and region code. The matching variables selected for PSM are assumed to be determinants of migration. The underlying assumption is that across the selected characteristics, treatment

women that are similar to control women group are matched together as they demonstrate having the same probability of having migrant husbands. In this study, we apply the Mahalanobis matching technique to estimate the average treatment effect (ATE) and the average treatment on treated (ATT). Two other matching techniques that are nearest neighbor matching (NNM) and kernel density matching, are also applied for comparison and are put in the Appendix.

4.2. Estimation results

Table 3 provides the logistic estimates of the relationship between husband outmigration and women's employment. Women employment includes being employer, working for someone else (employee), and self-employed. The results show that married women in households with husband outmigrants are more likely to become employer by 22 percentage points. Although there is a positive relationship between husband migration and women being self-employed, the result is not statistically significant.

Table 3: Male outmigration and women employment

	(1)	(2)	(3)
Variables	**employer**	**employee**	**self-employed**
Husband outmigration	0.0216**	-0.0218	0.00848
	(0.0100)	(0.0292)	(0.0105)
Age of woman	0.0126***	0.0329***	-0.000414
	(0.00377)	(0.00572)	(0.00422)
Women education	0.0177**	0.137***	-0.00218
	(0.00845)	(0.0223)	(0.00728)
Wealth score	0.00689	0.0398***	0.0216***
	(0.00477)	(0.00882)	(0.00601)
Daughter-in-law	-0.000406	-0.0131	-0.00120
	(0.00841)	(0.0212)	(0.00834)
Rural	-0.0298*	-0.126***	-0.00244
	(0.0155)	(0.0181)	(0.0130)
Observations	2,137	2,137	2,137

Note: Logistic regressions. Marginal effect is reported. Dependent variables are binary. The set of control variables includes women's education, husband's education, women's age, husband's age, number of female adults, number of male adults, number of children less than five years of age, number of children aged 5-17, indicator for living in rural area, religion, household's ownership of land, livestock, wealth. Clustering errors at household level. Standard errors in brackets; *** p<0.01, **p<0.05, * p<0.1

Table 4 shows the logistic estimates of the relationship between husband outmigration and women empowerment, particularly over a wide range of decision making. Overall, the findings suggest that absence of husband brings more freedom for women to make their own decisions. They are more likely to control household income, make decisions on household purchases, making decisions about their own healthcare and visiting relatives as well as contraception use. Particularly, absence of husband is associated with 10-percentage point higher for women to make decision about her own healthcare, compared to presence of husband.

Table 4: Male outmigration and women empowerment

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Control over household income	Decision about own healthcare	decision for major household purchases	decision for daily household purchases	decision for visiting relatives	Contraception use
Husband outmigration	0.170***	0.104***	0.0783***	0.106***	0.112***	0.113***
	(0.0264)	(0.0280)	(0.0164)	(0.0302)	(0.0240)	(0.0247)
Age of woman	0.00610	0.00889	0.0164**	0.00877	0.00501	0.00582
	(0.0127)	(0.0128)	(0.00676)	(0.00926)	(0.00745)	(0.00723)
Daughter-in-law	-0.00815	-0.0393*	-0.00506	-0.0142	0.0216	0.0213
	(0.0240)	(0.0236)	(0.0146)	(0.0244)	(0.0193)	(0.0188)
Living in rural area (=1)	0.00941	-0.0829**	0.0208	-0.0406	-0.0167	-0.0712***
	(0.0329)	(0.0401)	(0.0234)	(0.0354)	(0.0237)	(0.0168)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,137	2,137	2,137	2,137	2,137	2,137

Note: Logistic regressions. Marginal effect is reported. Dependent variables are binary. The set of control variables includes women's education, husband's education, women's age, husband's age, number of female adults, number of male adults, number of children less than five years of age, number of children aged 5-17, indicator for living in rural area, religion, household's ownership of land, livestock, wealth. Clustering errors at household level. Standard errors in brackets; *** p<0.01, **p<0.05, * p<0.1

Propensity scores matching results

The results of PSM using Mahalanobis matching technique is reported in **Table 5** and two other matching techniques, namely the nearest neighbor matching and kernel matching are put in the Appendix. Migrating husband has statistically significant and positive effects on wife's control over use of household income, household purchases, and statistically significant but smaller effects on women's decisions to visit relatives and contraception use, across all three matching techniques. On average, women with migrant husband are about 18-percentage point more likely to have control over household income, 10-percentage point more likely to make

decision on daily household purchases, in comparison with a situation that her husband is at home. Our estimates from PSM approach are also consistent and have similar magnitude as the logit estimation[5].

Table 5: Propensity score matching result: Mahalanobis matching

	(1) **Employer**	(2) **Employee**	(3) **Self-employed**
ATT	0.00515	0.0175	-0.00187
	(0.0150)	(0.0419)	(0.0122)
ATE	0.026	0.005	0.01
	0.021	0.04	0.016
Observations	2,137	2,137	2,137
	(4) **Control over household income**	(5) **Decision about own healthcare**	(6) **decision for major household purchases**
ATT	0.179***	0.0788	0.0905**
	(0.0499)	(0.0563)	(0.0366)
ATE	0.219***	0.12	0.141**
	0.05	0.051	0.037
Observations	2,137	2,137	2,137
	(7) **decision for daily household purchases**	(8) **decision for visiting relatives**	(9) **Contraception use**
ATT	0.108**	0.0786**	0.0760*
	(0.0532)	(0.0377)	(0.0402)
ATE	0.135**	0.151**	0.115*
	0.053	0.043	0.043
Observations	2,137	2,137	2,137

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

[5] Across the three matching techniques, the ATT for control over use of household income ranges from 0.19 to 0.25, indicating that on average, women are around 25 percentage point more empowered in terms of income control. Women from households with husband migration also shows a greater likelihood of control over major household purchases. The ATT values range from 0.10 to 0.14 across the three matching methods.

Heterogenous analysis

Living in extended family is traditionally and culturally common in Samoa (Kalara et al., 2022). The behavior of women, especially younger brides, maybe moderated when they live together with their parent(s)-in-law and other family members, affecting their performance of household roles and ability to decide on personal and household matters. Owning land is associated with higher social titles, more power and influence in the village as well as in the family. Given these important features of the Samoan society, we look at the results on sub-sample in **Table 6** covering the different types of living arrangement of women spouses. Overall, the findings show that women who do not live with parent(s)-in-law, or live in extended family, or in household with land, have more control over household income.

Table 6: Heterogenous analysis, average treatment effect (ATE) using Mahalanobis matching

	Living with parent(s)-in-law		**Living in extended family**		**Household owns land**	
	=1	=0	=1	=0	=1	=0
Employer						
Husband migration	0.0530*	-0.0288***	0.0520	0.00649	0.0520	0.0261
	(0.0278)	(0.0100)	(0.0364)	(0.0212)	(0.0364)	(0.0263)
Employee						
Husband migration	-0.0268	-0.131*	-0.0220	-0.00259	-0.0220	-0.0582
	(0.0341)	(0.0776)	(0.0443)	(0.0472)	(0.0443)	(0.0368)
Self-employed						
Husband migration	0.00228	-0.0183**	0.00146	-0.00389	0.00146	0.00904
	(0.0105)	(0.00750)	(0.0146)	(0.0107)	(0.0146)	(0.0252)
Control over household income						
Husband migration	0.168***	0.366**	0.159***	0.220***	0.159***	0.200***
	(0.0488)	(0.158)	(0.0580)	(0.0655)	(0.0580)	(0.0703)
Make decision about own healthcare						
Husband migration	0.105**	0.0995	0.0483	0.208***	0.0483	0.0783
	(0.0462)	(0.147)	(0.0578)	(0.0699)	(0.0578)	(0.0631)
Make decisions for major household purchases						
Husband migration	0.126***	0.173	0.129**	0.108*	0.129**	0.0683
	(0.0396)	(0.133)	(0.0521)	(0.0556)	(0.0521)	(0.0494)

Make decisions for daily household purchases						
Husband migration	0.123***	0.207	0.107*	0.189**	0.107*	0.118*
	(0.0476)	(0.140)	(0.0604)	(0.0747)	(0.0604)	(0.0692)
Make decisions for visits to relatives						
Husband migration	0.111***	0.113	0.122**	0.0752	0.122**	0.0402
	(0.0398)	(0.136)	(0.0537)	(0.0590)	(0.0537)	(0.0568)
Contraception use						
Husband migration	0.112***	0.134	0.104**	0.0960*	0.104**	0.0191
	(0.0402)	(0.139)	(0.0520)	(0.0559)	(0.0520)	(0.0480)
N	1,755	382	1,366	771	1,366	996

Note: Extended family is defined as a household having more than 9 members (bigger than the average household size in the sample). Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

5. Discussion and conclusion

Migration is a prevalent and increasing trend in many Pacific Island countries. We examine the impact of husband outmigration in Samoa, where migration stock/population is the second highest in the region with more than 60% of the population emigrating.

In the context of this study, data unavailability precludes us from using the instrumental variables that previous studies used such as rainfall and ethnicity-specific migration network (Sapkota and Wie, 2019[6]). There is no household panel dataset available in Samoa, no relevant policies available to use as a natural experiment, and the MICS primary sampling units are not sufficiently granular to give us a chance to take advantage of within-country heterogeneity in infrastructure, weather, or other sources of exogenous variation. Because of that, we apply propensity score matching approach for estimation.

Findings from the study show that husband migration increases women's control over household use of income, major and daily household purchases. Women in households with migrant husband are also more likely to report having a final say on their own health care, visit relatives, and use of contraception.

[6] This is one of the few studies that addresses the endogeneity of migration decisions using rainfall and migration network as instrument variables. The study finds that women in households with a migrant are more likely to have the final say on their own healthcare. But other aspects of empowerment are negatively impacted by migration.

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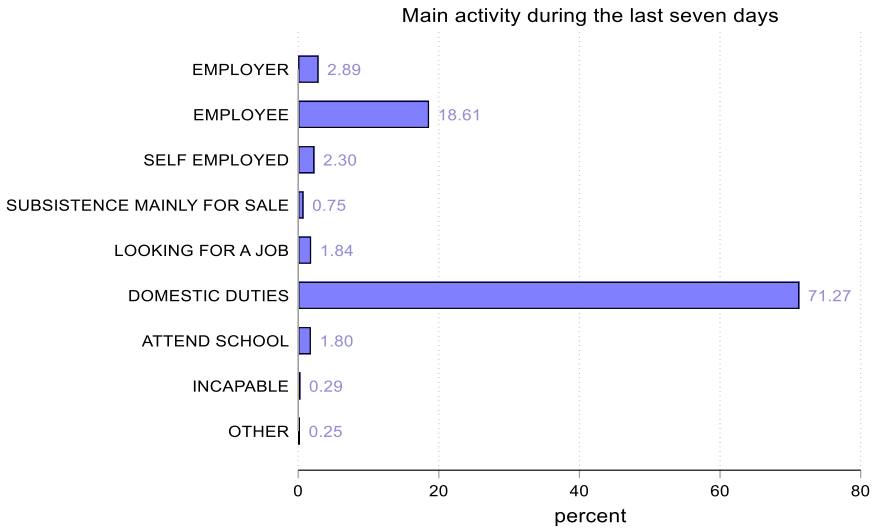
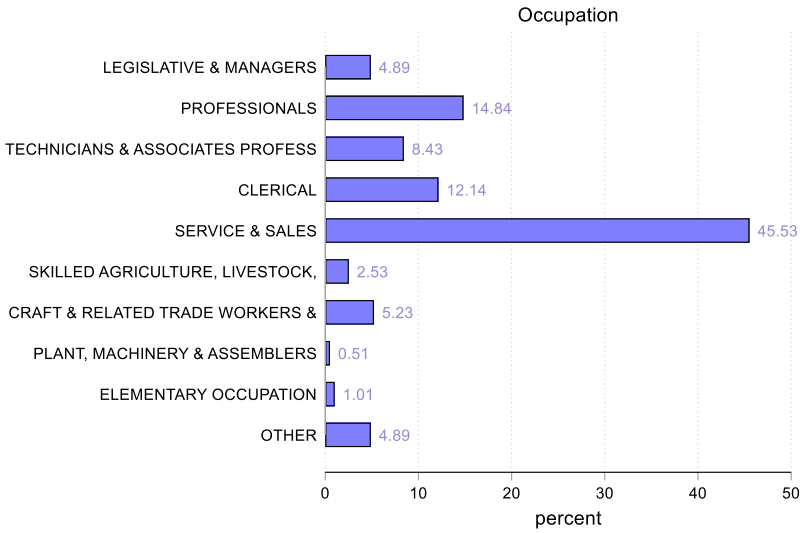
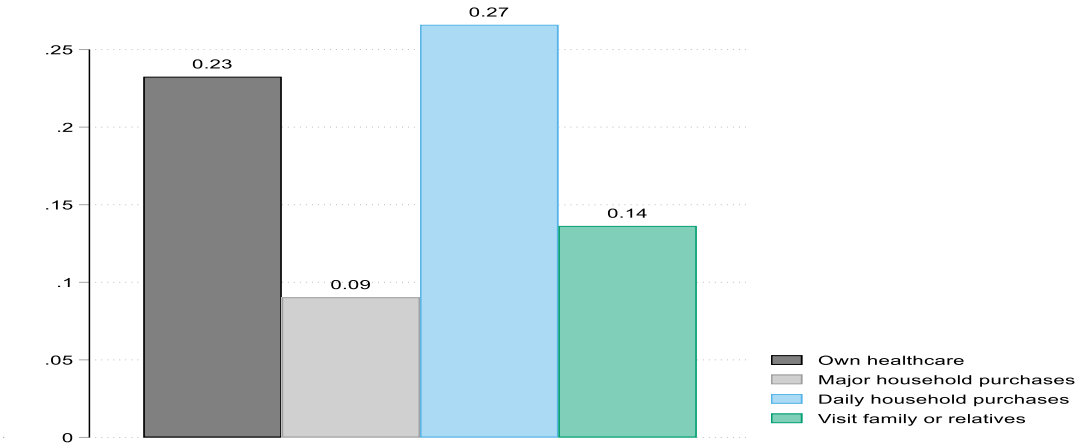
Appendix



Note: employed is defined as having done work in the past seven days. Includes people who did not work in the past seven days but who are regularly employed and were absent from work for leave, illness, vacation, or any other such reason.





Male migration and women employment

Variables	(1) employer	(2) employee	(3) self employed
Husband outmigration	0.0216**	-0.0218	0.00848
	(0.0100)	(0.0292)	(0.0105)
Age of woman	0.0126***	0.0329***	-0.000414
	(0.00377)	(0.00572)	(0.00422)
Age squared	-0.000184***	-0.000421***	3.64e-05
	(4.78e-05)	(7.91e-05)	(5.92e-05)
Women education	0.0177**	0.137***	-0.00218
	(0.00845)	(0.0223)	(0.00728)
Age of husband	-0.000105	-0.000508	-0.00117**
	(0.000875)	(0.00121)	(0.000510)
Husband education, secondary school	0.00284	-0.00605	-0.000610
	(0.00643)	(0.0203)	(0.00856)
Wealth score	0.00689	0.0398***	0.0216***
	(0.00477)	(0.00882)	(0.00601)
Household size	-0.00153	-0.000120	-0.00108
	(0.000999)	(0.00200)	(0.00135)
Number of children women has	-0.00258	-0.0192***	5.62e-05
	(0.00271)	(0.00497)	(0.00283)
Daughter-in-law	-0.000406	-0.0131	-0.00120
	(0.00841)	(0.0212)	(0.00834)
Rural	-0.0298*	-0.126***	-0.00244
	(0.0155)	(0.0181)	(0.0130)
Religion = 2, ROMAN CATHOLIC	-0.0124	0.00745	0.0204**
	(0.0131)	(0.0190)	(0.0101)
Religion = 3, LATTER DAY SAINTS	-0.0130	-0.0149	0.00833
	(0.0127)	(0.0265)	(0.00704)
Religion = 4, METHODIST	0.00886	-0.0138	0.00542
	(0.0140)	(0.0210)	(0.00739)
Religion = 5, ASSEMBLY OF GOD	-0.0274***	0.0104	0.0155
	(0.00825)	(0.0294)	(0.0112)

Religion = 6, OTHERS	-0.00132	-0.0452	0.0290***
	(0.0123)	(0.0278)	(0.0112)
Observations	2,137	2,137	2,137

Note: Logistic regressions. Marginal effect is reported. Dependent variables are binary. The set of control variables includes women's education, husband's education, women's age, husband's age, number of female adults, number of male adult, number of children less than five years of age, number of children aged 5-17, indicator for living in rural area, religion, household's ownership of land, livestock, wealth. Clustering errors at household level. Standard errors in brackets; *** p<0.01, **p<0.05, * p<0.1

Male migration and women empowerment

Variables	(1) Control over household income	(2) Decision about own healthcare	(3) decision for major household purchases	(4) decision for daily household purchases	(5) decision for visiting relatives	(6) Contraception use
Husband outmigration	0.170***	0.104***	0.0783***	0.106***	0.112***	0.113***
	(0.0264)	(0.0280)	(0.0164)	(0.0302)	(0.0240)	(0.0247)
Age of woman	0.00610	0.00889	0.0164**	0.00877	0.00501	0.00582
	(0.0127)	(0.0128)	(0.00676)	(0.00926)	(0.00745)	(0.00723)
Age squared	-3.38e-05	-0.000109	-0.000220**	-7.71e-05	-3.23e-05	-4.37e-05
	(0.000175)	(0.000178)	(9.85e-05)	(0.000137)	(0.000108)	(0.000112)
Women education	-0.00831	0.00494	-0.0183	-0.0161	-0.0151	-0.00314
	(0.0166)	(0.0166)	(0.0120)	(0.0202)	(0.0131)	(0.0153)
Age of husband	-0.00237	0.000364	-8.29e-05	-0.00110	-0.00125	-0.00149
	(0.00155)	(0.00129)	(0.00116)	(0.00136)	(0.00127)	(0.00140)
Husband education, secondary school	0.0228	-0.00900	-0.0131	-0.0147	0.00604	0.0272*
	(0.0215)	(0.0207)	(0.0145)	(0.0259)	(0.0141)	(0.0165)
Wealth score	0.00310	-0.0145	0.0145**	-0.0105	0.00652	-0.0101
	(0.0110)	(0.0126)	(0.00707)	(0.0140)	(0.00881)	(0.00679)
Household size	-0.00121	0.00114	0.000307	0.000629	0.00139	-0.000253
	(0.00249)	(0.00219)	(0.00123)	(0.00188)	(0.00195)	(0.00214)
Number of children	-0.00392	0.00111	-0.00727	-0.00325	-0.00149	-0.00281
	(0.00974)	(0.00760)	(0.00474)	(0.00792)	(0.00447)	(0.00500)
Daughter-in-law	-0.00815	-0.0393*	-0.00506	-0.0142	0.0216	0.0213
	(0.0240)	(0.0236)	(0.0146)	(0.0244)	(0.0193)	(0.0188)
Living in rural area (=1)	0.00941	-0.0829**	0.0208	-0.0406	-0.0167	-0.0712***
	(0.0329)	(0.0401)	(0.0234)	(0.0354)	(0.0237)	(0.0168)
Religion = 2, ROMAN CATHOLIC	0.0181	0.00503	-0.0182	0.0457	-0.00492	-0.0160
	(0.0330)	(0.0384)	(0.0250)	(0.0340)	(0.0276)	(0.0249)
Religion = 3, LATTER DAY SAINTS	-0.0197	-0.00327	-0.0320*	-0.0172	-0.0408	-0.0201
	(0.0326)	(0.0270)	(0.0175)	(0.0323)	(0.0258)	(0.0266)
Religion = 4, METHODIST	0.0230	-0.00701	-0.0399*	-0.0201	-0.00363	-0.00901
	(0.0293)	(0.0366)	(0.0218)	(0.0330)	(0.0285)	(0.0264)

Religion = 5, ASSEMBLY OF GOD	-0.00674	-0.0353	-0.0145	-0.00542	-0.0269	0.00619
	(0.0261)	(0.0309)	(0.0190)	(0.0330)	(0.0237)	(0.0174)
Religion = 6, OTHERS	-0.0611*	-0.0372	-0.0466**	-0.0194	-0.0215	-0.0182
	(0.0367)	(0.0361)	(0.0226)	(0.0325)	(0.0265)	(0.0279)
Observations	2,137	2,137	2,137	2,137	2,137	2,137

Note: Logistic regressions. Marginal effect is reported. Dependent variables are binary. The set of control variables includes women's education, husband's education, women's age, husband's age, number of female adults, number of male adult, number of children less than five years of age, number of children aged 5-17, indicator for living in rural area, religion, household's ownership of land, livestock, wealth. Clustering errors at household level. Standard errors in brackets; *** p<0.01, **p<0.05, * p<0.1

Propensity scores matching results across three matching techniques

Employment and empowerment outcomes	Nearest neighbor matching			Kernel density matching			Mahalanobis matching		
	Treatment obs.=192 Control obs.=1945			Treatment obs.=179 Control obs.=653			Treatment obs.=192 Control obs.=1945		
	ATT	s.e.	T-stat	ATT	s.e.	T-stat	ATT	s.e.	T-stat
Employer	0.032	0.018	1.780	0.028	0.024	1.150	0.026	0.021	1.240
Employee	-0.044	0.033	-1.310	0.010	0.044	0.230	0.005	0.040	0.130
Self-employed	0.015	0.013	1.110	0.011	0.017	0.670	0.010	0.016	0.640
Control over household income	0.188**	0.042	4.510	0.249**	0.053	4.680	0.219**	0.050	4.360
Decision about own healthcare	0.101*	0.041	2.440	0.135*	0.053	2.530	0.120	0.051	2.340
Decision for major household purchases	0.106**	0.033	3.240	0.147**	0.040	3.720	0.141**	0.037	3.790
Decision for daily household purchases	0.123**	0.042	2.900	0.152**	0.055	2.760	0.135*	0.053	2.570
Decision for visiting relatives	0.144**	0.036	3.960	0.158**	0.045	3.480	0.151**	0.043	3.490
Contraception use	0.135**	0.035	3.860	0.113**	0.044	2.570	0.115*	0.043	2.670

Note: ATT: average treatment on treated; *** p<0.01, **p<0.05, * p<0.1
Treatment observations: women with migrant husband; Control observations: women with husband