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Suggested Citation: Ayalew, Haile Ademe; Mohanty, Pratap C. (2022) : Do remittances affect labour participation decisions and hours worked? Evidence from Ethiopia, Cogent Economics & Finance, ISSN 2332-2039, Taylor & Francis, Abingdon, Vol. 10, Iss. 1, pp. 1-32, https://doi.org/10.1080/23322039.2022.2093821

This Version is available at: https://hdl.handle.net/10419/303697

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Cogent Economics & Finance

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/oaef20

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To cite this article: Haile Ademe Ayalew & Pratap C. Mohanty (2022) Do remittances affect labour participation decisions and hours worked? Evidence from Ethiopia, Cogent Economics & Finance, 10:1, 2093821, DOI: <u>10.1080/23322039.2022.2093821</u>

To link to this article: <u>https://doi.org/10.1080/23322039.2022.2093821</u>

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Received: 11 January 2022 Accepted: 21 June 2022

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Reviewing editor: Goodness Aye, Agricultural Economics, University of Agriculture, Benue State, Makurdi, Nigeria

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DEVELOPMENT ECONOMICS | RESEARCH ARTICLE Do remittances affect labour participation decisions and hours worked? Evidence from Ethiopia

Haile Ademe Ayalew^{1*} and Pratap C. Mohanty¹

Abstract: The present study examines the impact of remittances (foreign and domestic) on labour participation decisions and hours worked in Ethiopia. By exploiting nationally representative panel data obtained from the Ethiopian Socio-Economic Survey (ESS) 2013/14 and 2015/16, this study finds that receiving foreign remittances has a negative impact on the adult labour participation decisions and hours worked in Ethiopia. Its effect is also conditional on occupation, gender, and residential location. However, the impact of domestic remittances on the decision to participate in the non-domestic labour activity is mixed by residential location. Labour participation decisions for rural adults has increased but decreased for the urban. Its effect on the labour participation decisions in temporary paid jobs is also positive. On the other hand, this study finds that child labour participation decisions and hours worked are neither affected by the amount of foreign and domestic remittances nor by remittance-receiving status. The econometric technique applied logit and Tobit models, and a robustness check has been carried out using the per adult equivalent amount of remittances. This study suggested that further studies to identify causes for the negative effects on labour participation decisions and hours worked are critical to designing an appropriate policy. However, since it increases adult labour participation in rural areas and participation in temporary paid jobs, enabling policies to increase domestic remittances are highly important.

Subjects: Development Studies; Development Policy; Economics; Finance

Keywords: Labour participation; hours worked; foreign remittance; domestic remittance; Ethiopia



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PUBLIC INTEREST STATEMENT

Labour is a key resource for economic growth and development.However,its participation in the labour market and hours used for work can be affected by different factors. In this regard, the impact of remittances on labour market activity is a priori indeterminate. Documented evidences reveal both positive and negative impacts of remittances. Therefore, analyzing how remittances are affecting the labour participation decisions and hours worked in a given economy or community is crucial for a timely and necessary intervension.

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JEL classifications: F22; F24; F65; J01; J08

1. Introduction

The impact of remittances on labour participation decisions, labour supply, occupational choice, and so forth have been under continuous scrutiny. Several examinations were conducted with the help of various evolving methodologies, various economies, regions, and socio-demographic setups. As a result, empirical findings were highly mixed.

Theoretically, remittances can have an indeterminate effect on labour participation decisions and hours worked. On the positive side, by providing an additional financial resource that can be used to expand an existing business or start a new business, remittance can create new employment opportunities. As a result, remittance incomes will increase labour market participation and hours worked. In this way, remittance can be an important stimulant to the labour market, especially in economies with limited labour and credit markets. On the other hand, migrantsending families could face a shortage of working labour force for non-domestic activities, particularly following the migration of young adult members. Hence, the substitution effect of the foregone labour may dominate the income effect of remittances. As a result, labour participation decisions and hours worked in remittance-receiving households will increase (Acosta, 2020).

Furthermore, migration could exert upward pressure on wage rates, particularly in states or communities where migration rates were high. Higher wage rates, in turn, will have income and substitution effects. A dominant substitution effect over the income effect increases labour participation decisions and hours worked. However, labour participation decisions and hours worked will decrease when the income effect dominates. According to Hanson (2007) and Mishra (2007), life-cycle considerations also matter for either income or substitution effect to dominate.

On the negative side, remittances could decrease labour participation decisions and hours worked in different ways. The first way is through its effect on the reservation wage rate.¹ Remittance income could increase the reservation wage rate of labour market participants. If individuals in the labour force consider leisure as a normal good, extra non-labour income in the form of remittance may increase the reservation wage rate. As a result, for a market wage rate that is less than the reservation wage rate, the individual will be unwilling to work (Rodriguez & Tiongson, 2001).

Secondly, an additional non-labour income in the form of remittances could push non-migrant adults to enrol for further education. This effect is more significant when attending higher education is believed to result in better access to the foreign labour markets, and the return from higher education is attractive. As a result, current participation in the labour market and hours worked decrease(Acosta et al., 2006; Görlich et al., 2007; McKenzie & Rapoport, 2011).

Thirdly, due to the information barrier between remittance receiver(s) and sender(s), remittance income may cause unproductive moral hazard problems such as dependency on the remittance income and laziness (Azam & Gubert, 2006; Chami et al., 2018). Hence, labour participation and hours worked by the left-behind members will decrease. Furthermore, remittance income could reduce labour participation decisions and hours worked in non-domestic activities through increasing involvement in domestic activities like home productions and childcare.

At this stage of the discussion, the question that comes to anyone's mind is, therefore, which effect of the remittance income is dominant in a particular economy, socio-demographic setup, or any other conditions. The answer to this question is indeed an empirical one.

Ethiopia is among the first ten largest foreign remittance recipient countries in Sub-Saharan Africa (Tsegay & Litchfield, 2019). According to the National Bank of Ethiopia (NBE) various year reports(for instance, from 2009/10-2018/19), foreign remittance inflow has been steadily increasing, and the country received more than US\$3.8 billion (both from formal and informal channels) with an average growth rate of 13.75%. The average inflow during the period was significantly higher than the country's total export earning, Foreign Direct Investment (FDI), or Official Development Assistance (National Bank of Ethiopia, 2019).

On the other hand, a report from the United Nations Capital Development Fund(UNCDF) shows that formal emigrants from Ethiopia reached more than 1.2 million in 2019, of which 49.1% were female. In addition, more than 1 million undocumented migrants are estimated to live in the Kingdom of Saudi Arabia and South Africa. According to this report, some 24% of the adult population in 2017 received remittances, 78% of the remittances in 2018 were sent through informal channels, and the total annual foreign remittances in 2019 reached over \$5 billion accounting for some 5% of the country's Gross Domestic Product (UNCDF, 2021).

Nevertheless, studies on the micro-economic impacts of remittances in Ethiopia are too scanty. Assaminew et al. (2011) used cross-sectional data and found that foreign remittances reduced poverty incidence among urban households in Ethiopia. This study also showed that female-headed households use foreign remittances more effectively than male-headed households. Beyene (2014) also find foreign remittances significantly reduced urban poverty without affecting inequality. Giorgis and Molla (2013) showed that poverty declines in foreign remittance-receiving urban households. Although mainly spent on food and durable goods, households spend part of their remittance income on health, education, and housing. However, the effect of foreign remittance is insignificant.

Andersson (2014) studied the impact of migration and foreign remittances on the economic well-being of rural Ethiopians. The study revealed migration improved the economic well-being of households by positively affecting consumer asset accumulation. Furthermore, in the case of Tigray, Abadi et al. (2018) found that foreign remittance-receiving households exhibit a lower experience of insufficient quantity of food intake and a higher ability to secure adequate quality food than non-receiving households.

However, the fundamental weakness of studies discussed before is that conclusions were drawn from studies carried out using cross-sectional data and almost in urban settings, except Andersson (2014). Thus, it is hardly possible to utilize results for national policymaking. Hence, the contribution of the present study is three-fold. First, to the best of the researcher's knowledge, the labour market dimension of the remittance impacts in Ethiopia has been overlooked. Second, the present study relaxed the dominant focus on foreign remittances by focusing on both foreign and domestic remittances using the latest nationally representative socio-economic survey data in Ethiopia. The approach is highly beneficial for distinguishing the relative importance of the two non-labour incomes from different sources. Third, the study applied a panel data methodology that most studies in the area failed to apply due to a lack of panel data. Semykina & Wooldridge (2010) suggest that panel data is essential to overcome endogeneity and selection biases by controlling the unobserved heterogeneities and time-invariant omitted variables.

Furthermore, a wide range of studies have been carried out in Latin America and Asia. However, Ethiopia is different from those countries in terms of the major remittance receiving groups, levels of education, social and political commitment towards women empowerment, socio-economic diversities, the scope of entrepreneurial ventures, and so on. For instance, in the studies conducted in Asia and Latin America, the main recipients were rural households(Amuedo-Dorantes et al., 2006; Kan, 2021; Manuel Orozco, 2019; Mughal & Makhlouf, 2013; Raihan et al., 2018). However,

the higher proportion of the remittance recipients in Ethiopia is urban households (ESS2,2013/14 and ESS3,2015/16).²

This study attempts to answer the following fundamental research questions.1) Do labour market participation decisions and hours worked in remittance-receiving households differ from their non-receiving counterparts?³ 2) Are impacts of remittances on labour participation and hours worked conditional upon age, gender, or geographic variation? 3) Do remittances (foreign and domestic) impact child labour? 4) How do remittances affect adult occupational choice?

The samples of this study have two groups: adults (whose age is 15–64) and children (whose age is 7–14). The purpose of separating the children's sub-sample from the adult sub-sample is to create an opportunity to examine if remittances also have an impact on child labour in Ethiopia. Because child labour is a true existential phenomenon in most developing countries, a separate examination can help to show concerns related to child education and health. If the study confirms an effect on child labour, its implication will be helpful for policymakers and stakeholders working in the area.

As a new study with nationally representative panel data on Ethiopia, the present study provides essential supplementary techniques and evidence to the existing literature and policymakers. It will serve as a benchmark for further studies on different developmental issues of developing countries and Ethiopia in particular. In sum, the approaches and findings of this study will add a significant contribution to the present literature.

The remaining part of the paper is structured as follows. Section two presents the literature review part. Section three discusses the data source, type, and description. The fourth sections cover the econometric model and estimation strategies. The fifth section holds the results and discussion part, and section six presents the conclusion and implications of the study.

2. Literature review

U

A profound benchmark for the analysis of labour participation decisions and labour supply behaviours of individuals exists in the neoclassical model of labour-leisure choice. According to the neoclassical model, individuals have utility maximization objectives subject to their budget constraints. Thus, the starting point is the individual utility function(Borjas, 2016). Assume that, for simplicity, individuals in the labour force derive utility from money income(C), the total monetary value of all commodities consumed, and leisure(L), the total hours spent for leisure. Further, assume that the worker uses all his income for consumption without saving. Thus, the utility function of a representative individual can be expressed as follows:

$$=f(\mathsf{C},\mathsf{L}) \tag{2.1}$$

Where U is utility, C is monetary income, and L is leisure time. Both C and L are "goods" and not "bads" (i.e., $U_C = \frac{\partial f}{\partial C} > 0$ and $U_L = \frac{\partial f}{\partial L} > 0$). C and L are also, to some extent, substitutes for each other. A worker may give up some hours of leisure and use it for work by maintaining the same level of satisfaction.

However, the optimum combination of C and L a worker can attain is constrained by his/her budget composed of his/her labour and non-labour incomes. Thus, the individual's budget constraint will have the following form:

$$C = wH + V \tag{2.2}$$

Where w is the hourly wage rate (assumed constant), H is the total work hours, and V is non-labour income. Note that the total hours available for work and leisure (T) assumed as constant can be expressed as T = H + L. Thus, H = T - L. Substitution in equation (2.2) gives:

$$C = wT + V - wL \tag{2.3}$$

The utility maximization problem of a rational consumer utilizes both the utility function presented in equation (2.1) and the individual's budget constraint as in equation (2.3). Maximizing the Lagrange then gives the first-order solution.

$$Max\Omega = U(C,L) + \lambda(C - wT - V + wL)$$
(2.4)

Maximizing the Lagrangian function presented in equation (2.4) with respect to C and L gives the familiar first-order condition that the ratio of marginal utilities is equal to the constant wage rate.

$$\frac{U_L}{U_C} = w \tag{2.5}$$

However, the derivation of the final demand function requires both equations (2.5) and the constraint in equation (2.3).⁴ As a result, the individual's demand function for leisure and work can be specified as:

$$L^* = \ell(\mathbf{w}, \mathbf{T}, \mathbf{V}, \mathbf{Z}_i, \varepsilon_i) \tag{2.6}$$

$$H^* = T - \ell(\mathbf{w}, T, \mathbf{V}, \mathbf{Z}_i, \varepsilon_i)$$
(2.7)

Where L^* and H^* are the optimum hours of leisure and work, respectively. *wT* is the total labour income if the whole time is used for work, and wL is the total expenditure on leisure. V is the non-labour income and Z_i stands for other important economic and socio-demographic factors that could determine the individual's decision to work and leisure. The final term ε_i captures the model error.

At this stage, the most important question related to the objective of this study is how changes in non-labour income (V) affect the optimum allocation of work and leisure? For instance, assume that our key variable of interest, remittance(one of the important non-labour incomes), increases while the market wage rate is constant. Further, assuming that leisure is a normal good, the individual can afford a higher expenditure for consumption goods(C) and more leisure hours (L). Hence, the individual would attain a higher level of utility by decreasing hours of work or the decision to participate in labour activities. This condition may imply the disincentive(moral hazard) effect of the non-labour income. However, if leisure is an inferior good to the individual, an increase in the non-labour income would increase work hours through various means such as increasing entrepreneurial activity. Similarly, a decline in remittances could increase work hours or the decision to participate in labour activities.

Based on neoclassical foundations, there are three basic theories related to the labour market effect of remittances. First, remittances can have a disincentive effect either by increasing the reservation wage or through moral hazard problems. Second, remittance income could have an educational effect. Remittance income could increase the number of household members choosing to join higher education by reducing the household budget and liquidity constraints. As a result, labour market participation will decrease. The third but contrasting view is that labour market participation and supply cannot decrease when the substitution effect of the remittance income dominates the income effect. Although working-age left-behind members live in remittancereceiving households, they can be forced to increase their participation in the labour market to substitute all or part of the activities of the migrated household member. However, participation in the labour market can decrease if the substitution effect is in home production or service activities. If the migrated household member had a more significant role in home production or service, remittance income will decrease participation in the labour market and increase household labour (Görlich et al., 2007).⁵

Empirical examinations of the relationship between remittances and labour market outcomes revealed substantially mixed results. According to Asiedu and Chimbar (2020); Chami et al. (2018); Dey (2021); Mughal and Makhlouf (2013); Ndiaye et al. (2018); Raihan et al. (2018); 2020) remittance income decreases the labour market participation of adults. In addition, by apparently focusing on labour supply(hours worked), Amuedo-Dorantes (2014); Amuedo-Dorantes and Pozo (2012); Justino and Shemyakina (2012); Murakami et al. (2021), and 2020) showed that hours worked or labour supply by family members in remittance-receiving households decreases as compared with their counterparts in the non-receiving households.

On the other hand, while studies such as Karymshakov et al. (2018) and Urama et al. (2017) conclude remittances do not affect labour supply, Posso (2012), by utilizing data from sixty-six developing countries for the period 1985 to 2005, find a positive relationship between remittances and aggregate labour supply. Moreover, Nwokoye et al. (2020) in Nigeria revealed that foreign remittances increased labour force participation in non-farm economic activities and in urban areas. Amuedo-Dorantes and Pozo (2012) also showed remittance volatility increases the probability of men's and women's employment and the hours worked by an employed woman.

The other interesting empirical matter on the effect of remittances in the labour participation decisions and hours supplied was the heterogeneous effect by gender and residential location. Chami et al. (2018) showed that male and female labour supply significantly exhibit different sensitivities to remittances. According to Asiedu and Chimbar (2020), Azizi (2018), and Kalaj (2013), remittances decrease women adult female labour participation and hours worked without affecting men's participation and hours worked. Mughal and Makhlouf (2013) showed the negative impact of remittances is higher among women, among the young, and in rural areas. The study also finds that foreign remittances decrease labour participation by increasing the likelihood of household members attending middle school. Asiedu and Chimbar (2020) also revealed the effect of remittances on the labour supply decisions in urban areas is very minimal and much stronger in rural areas. On the other hand, Dey (2021) and Phadera (2019) have revealed different results. Dey (2021) finds that the reduction in work participation due to foreign remittance is larger for males than females. Similarly, Phadera (2019) showed that remittances from abroad decrease men's overall labour supply.

A further important focus was how remittances affect occupational choice? Mughal and Makhlouf (2013) and Raihan et al. (2018) revealed that the likelihood of self-employment and own land cultivation increases among remittance recipient households. If highly educated men receive remittances, they are less likely to be wage-employed and more likely to be self-employed. Similarly, Vadean et al. (2019) showed remittance-receiving status increases self-employment in small scale activities and decreases the probability of men-wage employment. Acosta (2020) revealed minor labour reallocation effects of remittances on female labour participation and hours worked. By reducing the time dedicated to off-farm and domestic activities, foreign remittances increased female labour participation and hours worked in agricultural activities. However, the study conducted by Acosta (2020) in El Salvador showed that foreign remittances do not have a significant impact on self-employment and off-farm labour activities. Ndiaye et al. (2018) in Senegal also showed that foreign remittances provide less incentive for non-migrant family members to create their own businesses.

In addition, studies on the impact of remittances on child labour have been providing ambiguous results. Some revealed remittances reduce child labour(Abdul-Mumuni et al., 2019; Acosta, 2011; Binci & Giannelli, 2018; Joseph & Plaza, 2010; McKenzie & Rapoport, 2011). Abdul-Mumuni et al. (2019) showed that the negative effect of remittances on child labour is much higher for female-headed households. On the other hand, studies such as Nguyen and Nguyen (2015) cited in Hagen-zanker (2015) boldly showed the insignificant impact of remittances on child labour.

The other recently developing concern is the impact of remittances also varies depending on the source it comes from (domestic or foreign). Studies such as Mughal and Makhlouf (2013) showed foreign remittances have a higher role in the labour market than domestic remittances. Dey (2021), on the other hand, showed domestic remittances increased the intensity of labour supplied by households while foreign remittances were found to lower hours of work done by the left-behind family members. The study found that foreign remittances pushed workers into non-agricultural activities while domestic remittances increased the proportion of labour supplied in self-employment activities in the agricultural sector.

Regarding child labour, Binci and Giannelli (2018) find foreign remittances have a stronger impact in reducing child labour than domestic remittances in the cross-section data. But taking account of the fixed effects in the panel data analysis reversed the result and showed the only significant impact comes from domestic remittances. Joseph and Plaza (2010) also revealed children in foreign remittance-receiving households tend to work fewer hours, while belonging to a domestic remittance-receiving household tends to increase children's work hours. However, the impact of domestic remittances on the household's decision to send children to work is insignificant.

3. Data source, type, and description

This study utilized panel data obtained from the Ethiopian Socio-Economic Survey (ESS). So far, the ESS has conducted four surveys (ESS1, ESS2, ESS3, and ESS4). ESS1 was conducted by randomly selecting Enumeration Areas (EAs) from the Agricultural Sample Survey (AgSS) implemented in 2011/12. However, EAs in the AgSS, which were selected based on probability proportional to population size (PPS) approach, was made to cover only rural areas and small towns. Thus, ESS1 was not nationally representative as it did not cover the medium and large towns of the country.

The second survey (ESS2), which was conducted in 2013/14, was designed to improve the national representativeness of the ESS1 data. Hence, EAs of ESS1 and randomly selected EAs from the medium and large towns stratum were included. As a result, ESS2 became nationally representative of all regions as well as rural and urban areas. ESS2 made an urban supplement to the ESS1 by randomly selecting EAs from medium and large towns of the country through a stratified random sampling technique, size of the town being used as a stratum. Consequently, the urban sample is drawn independently from a stratified urban frame of households through probability proportional to the size of the population (PPS) approach.

The third wave (ESS3) conducted in 2015/16 was made to follow EAs and households covered in ESS2. However, the recent ESS4 (wave4), which was conducted in 2018/19, did not follow ESS2 and ESS3. The objective of ESS4 is to be used as a benchmark for the future panel data that the World Bank and the Central Statistical Agency (CSA) of Ethiopia are planning under their Living Standards Measurement Study (LSMS) project. Therefore, ESS2 and ESS3 became the only nationally representative ESS panel data readily available.

As a result, this study is limited to utilizing the data extracted from ESS2 (wave2) and ESS3 (wave3) of the ESS data. In sum, the ESS follows a two-stage probability sampling technique. In the first stage, EAs or primary sampling units (PSU) were randomly selected, followed by a random selection of households in each enumeration area in the second stage (CSA & World Bank, 2017).

ESS2 covered 5,262 households for an interview. However, only 4,954 households were followed in ESS3, with a successful follow-up rate of 94% and a 6% panel attrition rate. The survey was carried out using five standardized questionnaires classified as household, community, and three related to the agriculture sector (livestock, post-planting, and post-harvest questionnaires).

The main objective of this study is to examine whether remittances (from Ethiopia or outside of Ethiopia) have a significant impact on the labour participation and hours worked of non-migrant families. Hence, the study utilized individual, household, and community level information for non-migrant individuals from both remittances-receiving and non-receiving households.

Even though adults in the age group 15–64 are the primary focus group of this study, the study also includes the effect of remittances on child labour by using data on the 7–14 years old children separately. This is because child labour is a true existential phenomenon in most developing countries, and its consideration can have far more implications on child education and health as well. Our data in Table 1 shows child labour participation is significantly high in both remittance-receiving and non-receiving households. Finally, after dropping 0.7% of observations due to missing information, this study depends on 25,057 observations collected for adults covered in the 2013/14 and 2015/16 survey years and 11,193 observations collected for children covered during the same years.⁶

The first key variables of interest in this study are the remittance-receiving status of households and the amount of remittances each household received during the past twelve months of the survey year.⁷ The second key variables of interest are the labour participation decisions and hours worked by the left-behind adults and children during the same study periods. Both ESS2 and ESS3 were made to hold information on all the key variables of interest.

However, following the approaches of the most influential empirical literatures, such as Acosta (2020), Acosta et al. (2006) and Mughal and Makhlouf (2013), this study primarily used the dichotomous nature of the remittance variable, remittance-receiving status (i.e., the impact of living in a remittance-receiving household versus living in a non-receiving household).⁸ Nevertheless, the per adult equivalent amount of remittances received during the period are used in the robustness check.

A summary statistic presented in Table 2 indicates that approximately 7% of adults and 5% of left-behind children live in foreign remittance-receiving households. On the other hand,13 % of adults and 11% of children reported that their households received domestic remittances.

On average, households in the adult and children sub-sample received ETB 869.13 (\$43.28) and 512.38 (\$25.5) from foreign remittances.⁹ Domestic remittance-receiving households also received ETB 540.23 (\$26.9) and 373.70 (\$18.6) in the adult and children sub-sample categories. If we consider only remittance-receiving households, the average foreign remittance received increases to ETB 12833.12 (\$639.09) and ETB10389.65 (\$517.4) for adult and children's sub-sample, respectively and ETB 4111.95 (\$204.77) and ETB 3298.79 (\$164.28) in the case of domestic remittance-receiving households. In both cases, the average foreign remittances received are higher than domestic remittances, despite accounting for a small proportion of the sample than domestic remittances.

In the panel data, 55% of adults and 39% of children responded as having labour participation in the past one week. While 37% of adults and 37% of children in the sample have participated in HH agriculture (*HHAgr*), 21% of adults and 2% of children participated in HH non-agriculture activities (*HHnonAgr*). Besides, 4% of adults and 1% of children participated in temporary paid activities (*tempaid*). Furthermore, 8% of adults and 0% of children participated in non-temporary paid activities (*nontempaid*). On the other hand, 6% of adults and 3% of children participated in temporary paid activities (*nontempaid*). On the other hand, 6% of adults and 3% of children participated in more than one activity.

l able 1. Variable	name, measurem	ent and summary stati	stics of dependen	it and independent vari	ables		
Variable Name	Measurement	Mean	Std. Dev.	Mean	Std. Dev.	Min	Max
		Age 7–1	÷	Age 15-	54		
Dependent Variables:							
Labor participation (LPd)	=1 if yes,0 = other wise	68.	67.	.55	'n	0	1
LPd is in HH agriculture (HHAgr)	=1 if yes,0 = otherwise	.37	.48	.37	.48	0	1
LPd is in HH non- agriculture activities (HHnonAgr)	=1 if yes,0 = otherwise	.02	.14	.12	.32	0	1
LPd is in temporary paid activities (tempaid)	1 if yes,0 = otherwise	.01	.08	.04	.2	0	1
LPd is in non- temporary paid activities (nontempaid)	1 if yes,0 = otherwise	o	.04	80.	.28	0	1
Hours worked (Hours_worked)	Hours worked in a week	9.57	16.56	17.41	22.81	0	130
Independent Variable	S						
Foreign remittances	Continuous (LCU)	512.38	4444.3	869.13	9164.3	0	130,000
Domestic remittances	Continuous (LCU)	373.7	4825.2	540.23	6270.8	0	400,000
Receiving foreign remittances	=1 if yes,0 = otherwise	.05	.22	.07	.25	0	1
Receiving domestic remittances	=1 if yes,0 = otherwise	.11	.32	.13	.34	0	1
sex	=1 if male,0 = otherwise	.51	.5	.47	.5	0	1
Age	Year	10.41	2.24	31.83	13.02	7	14
							(Continued)

Table 1. (Continu	led)						
Variable Name	Measurement	Mean	Std. Dev.	Mean	Std. Dev.	Min	ΜαΧ
		A	1ge 7–14	Age 1	5-64		
Years of schooling	Years of schooling	2.08	2.16	4.48	4.73	0	18
Head Sex	=1 if male,0 = otherwise	.79	.41	.76	.43	0	1
Head Age	Year	45.95	12.21	45.94	13.71	8	98
Household Size	count	6.45	2.13	5.56	2.4		16
Working male	Total working age males	1.61	1.1	1.85	1.29	0	10
Working Female	Total working age females	1.53	88.	1.74	1.02	0	Ø
Paeq.consumption expenditure	Continuous (LCU)	5503.89	5243.57	6802.87	6356.31	810.65	347,501.4
Wealth	Index	-2.95	2.33	-2.2	2.86	-6.03	9.71
Shock occurrence	=1 if yes,0 = otherwise	.51	ν	87.	ż	0	1
Rural dummy	=1 if rural,0 = otherwise	.79	.41	.65	.48	0	1
Year dummy	= 1 if 2013,0 = otherwise	Ŀ.	5	.5	.5	0	1
		N1	l = 11,193	N2 = 2	5,057		
Note: The panel survi per adult equivalent (ey data utilized in this stu consumption expenditure	idy did not include i is used to proxy the	an aggregate data for the tot e per adult equivalent income	al household income. How. . "HH" refers to "Household	ever, aggregate household 1", "Paeq." refers to "per a	d consumption expendi Idult equivalent", LCU re	ture data is available. Hence, efers to "Local currency unit".

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		Age/-14			но-стаби			Age/-14			но-стаби	
			Foreign re	emittance					Domestic	remittance		
Variable	Non- Receiving (n= 10,641)	Receiving (n= 552)	diff.	Non- receiving (n= 23,360)	receiving (n= 1,697)	diff.	Non- receiving (n= 9,925)	Receiving (n= 1,268)	diff.	Non- Receiving (n= 21,765)	Receiving (n= 3292)	diff.
ГРА	.40	.31	.09**	.56	.46	.10***	65.	.36	.04**	.55	.52	.03***
LPd HHAgr	.29	.38	**(60.)	.38	.25	.13***	.38	.34	.04**	.38	.29	**60.
LPdHHnonAgr	.02	.01	.01	.12	.10	.02**	.02	.02	00.	.11	.12	(.01)
LPd tempaid	.01	.01	00 [.]	.04	.03	.01	.01	.01	00.	.04	.05	(.01)**
LPdnontempaid	.002	.002	000.	.08	.12	(.04)**	.002	.001	.001	.08	.12	(.04)**
Hours_worked	9.63	8.24	1.39**	17.52	15.79	1.73**	9.68	8.70	.98**	17.49	16.86	.630
Note: "diff." represent the m 0, respectively.	iean difference.	***, **, * refers	to the differen	nce is statistica	lly significant o	ıt 1%, 5%, anc	d 10% respecti	vely. The null a	nd alternative	: hypotheses ar	e H0: diff = 0, a	nd Ha: diff #

urs_workea	9.03	0.24	L.39	70.11	e/.ci	L./3	9.00	ø./U	90	17.49	10.00	050.
e: "diff." represent the m	ean difference.	. ***, **, * refers	to the differen	nce is statistica	lly significant a	rt 1%, 5%, and	10% respectiv	ely. The null ar	id alternative	hypotheses ar	'e H0: diff = 0, (ind Ha: diff #
espectively.												

Regarding the hours worked, adults, on average, have worked 17.4 hours per week while children worked 9.57 hours after excluding a few outliers. As shown in Figure A1, the hours worked data contain few outliers for those who have reported above 150 hours worked in a week. Surprisingly, the data contain more than 180 worked hours during the week while the maximum available work hours in a weak is only 168 hours if and only if the individual worked 24 hours throughout the week, which is unacceptable by any standard. Unless properly managed, such outliers in the data will contribute to a misleading result.

In Table 2, we tried to show the mean differences of the dependent and independent variables between members in remittance-receiving holds and non-receiving households. The overall result shows that the labour participation and hours worked of adults and children living in foreign or domestic remittance-receiving households is significantly lower than their counterparts in non-receiving households.

In an occupation-specific comparison, the majority of the adult and children samples spent their time in household agricultural (*HHAgr*) and non-agricultural activities (*HHnonAgr*). Participation in agricultural activity is also lower for adults and children living in remittance-receiving (foreign or domestic) households than their non-receiving counterparts. However, participation in the non-agricultural household activity is significant and lower only for adults in foreign remittance-receiving than adults in non-receiving households.

Labour participation in temporary paid jobs(*tempaid*) is significantly higher for only adults living in domestic remittance-receiving households than their non-receiving counterparts. Moreover, adults in foreign and domestic remittance-receiving households have more labour participation in non-temporary paid jobs(*nontempaid*) than adults living in non-receiving households.

The hours spent for work are also lower for adults and children living in foreign remittancereceiving households than their counterparts in non-receiving households. However, it is only for children living in domestic remittance-receiving households that work hours are less than their counterparts in non-receiving households. But whether an adult is in a domestic remittancereceiving household or not, the difference in the work hour is not statistically significant.

Given the important differences discussed above, the most relevant question is whether those differences in the labour market outcome (labour participation decisions and hours worked) are due to the household remittance-receiving status or not. This question invites a better econometric technique so as to control the important socio-demographic and economic factors.

4. Econometric model and estimation strategy

4.1. Model

This study examined the impact of remittances (foreign and domestic) on the labour participation decisions and hours worked of the non-migrant left-behinds. Participation decisions and hours worked in household agricultural activities, non-agricultural household activities, employment in temporary paid jobs, and employment in non-temporary paid jobs are considered for this study. While the dependent variable in the first model has a dichotomous nature (participated or not), the second model utilizes a censored continuous dependent variable. Because we only observe whether an individual has participated in a labour activity or not, participation decision (*LPd*) is a latent variable that depends on several observable and unobservable factors. Thus, the latent model can be expressed as follows:

$$LPd_{ijt}^{*} = R'_{jt}\beta + X'_{ijt}\alpha + Z'_{jt}\theta + \gamma T + \eta_{i} + \eta_{ij} + \eta_{ijt}$$

$$(4.1)$$

Because labour participation decision (LPd) = 1 if U(LPd*) > 0 and 0 = other wise:

$$\Pr\left(\mathsf{LPd}=1/\mathsf{R},\mathsf{X},\mathsf{Z},\mathsf{T},\eta_i,\eta_{ij}\right) = \Pr(\mathsf{R}'_{jt}\beta + \mathsf{X}'_{ijt}\alpha + \mathsf{Z}'_{jt}\theta + \gamma\mathsf{T} + \eta_i + \eta_{ijt} + \eta_{ijt} > 0)$$

The logit model (Wooldridge, 2010):

$$\Pr\left(LPd = 1/R, X, Z, T, \eta_i, \eta_{ij}\right) = F(R'_{jt}\beta + X'_{ijt}\alpha + Z'_{jt}\theta + \gamma T + \eta_i + \eta_{ij} + \eta_{ijt})$$
(4.2)

Where, $\eta_{iit} \sim Normal(0, \delta^2)$ and F(.) is the density function for logistic distribution of the model.

The second model applied to explain the relationship between remittances and hours worked (*Hours_worked*) constitutes a dependent variable with substantial zeros, and continuous positive values truncated from the left with zero values. The samples of this study revealed that around 48.9% of the sample observations have zero hours of work in the week. Hence, a left-censored Tobit model is specified with the following form:

Tobit model (Wooldridge, <xrefref - type = "bibr"rid = "cit0045">2010</xref>) : Hours_worked* = $R'_{jt} \beta + X'_{ijt} \alpha + Z'_{jt} \theta + \gamma T + \eta_{ijt}$ (4.3)

 $Hours_worked = \left\{ \begin{matrix} Hours_worked* \\ 0 \end{matrix} \qquad \mbox{if} \qquad \begin{matrix} Hours_worked*>0 \\ Hours_worked* \leq 0 \end{matrix} \right\}$

 $\eta_{ijt} \sim Normal(0, \delta^2), Hours_worked_{ijt} = max(Hour_worked*, 0)$

Where *Hour_worked* * is the unobserved latent variable that determines the value of the observed outcome variable *Hours_worked*. In both models, *R'* stands for a vector of remittance variables for household j at time t, *Z'* stands for various household socio-demographic and economic factors, and *X'* stands for a vector of individual characteristics in household j at time t. η_{ij} and η_{j} , respectively, are individual and household level time-invariant unobserved heterogeneities. *T* is a time dummy included for controlling the unobserved time-varying factors and η_{ijt} represents an identically and independently distributed idiosyncratic error term for individual i in household j at time t. β , α , θ and γ are the model parameters. The variables controlled in both models and their measurement are as defined in Table 1.

Finally, the effect of remittance-receiving status or amount of remittances on the labour participation decisions and hours worked by adults and children depends on the sign and magnitude of $\stackrel{\wedge}{\beta}$.

4.2. Estimation strategy

Attempting to identify the impact of remittances on labour market outcomes through a standard OLS procedure may lead to a biased and inconsistent coefficient estimate. Unobserved heterogeneity, omitted variables, reverse causality or simultaneity, and sample selection bias can be the potential sources of biased and inconsistent coefficients(Acosta, 2011, 2020; McKenzie & Rapoport, 2011)

A bias due to omitted variables can occur when factors strongly correlate with the labour market outcomes, and the migration(remittance) variables are omitted from the function. In the presence of such omission, there will be a strong correlation between the error term and the migration-(remittance) variable, which could bias the coefficient estimate.

In addition, as labour participation decisions and hours worked can be impacted by remittances, increased demand of the left-behinds for more labour participation and work hours could influence emigrants' decisions to send remittances back home, implying reverse causality. And also, if the

remitter realizes that the remittance sent home is causing undesired labour outcomes, such as decreasing willingness to work and hours spent for work, it can impose a negative effect on the remittance inflow. Furthermore, the same variables, income or health shocks, may simultaneously affect both remittances and labour participation or hours worked. Applying OLS in the presence of reverse causality and simultaneity will result in a biased and inconsistent estimate.

Moreover, migration and remittance are not considered the result of a random process. Migrants or remittance beneficiaries may be the result of a selective process. According to Taylor and Mora (2006), households that participate in migration and receive remittances differ fundamentally from those that do not. Such selections may be attributed to human capital, wealth, exposure to shocks, poverty, and others. If the sample is the result of a selection process, the standard OLS technique is inefficient to provide unbiased and consistent coefficient estimates and thus, leading to a sample selection bias.

Therefore, alternative methodological solutions have been suggested in the literature to overcome the potential endogeneity and sample selection biases on the remittance coefficient. One of the approaches is applying the instrumental variables (IV) technique. However, obtaining an instrument that satisfies the exclusion restriction property to the remittance variable is the most tedious procedure, as inefficient instruments will lead to a more misleading result. The second approach is applying a non-parametric technique such as propensity score matching (PSM) with strong assumptions.

Another advantageous approach is using panel data if sufficient panel data is available for selected variables. Panel data techniques have essential properties to solve endogeneity and sample selection biases. Semykina & Wooldridge (2010) showed that if a selection is at least partially determined by the fixed component of the error term over time, then panel data analysis moderates the influence of sample selection biases.

However, the challenge in applying panel data is that common estimation techniques cannot reduce the bias that time-varying unobservable factors cause. As a result, Kroeger and Anderson (2014) suggested including a time dummy in the model to capture the influence of time-varying unobservable factors that may be correlated with the independent remittance variable. Besides, including a shock variable in the model would help to control the influence of time-varying factors (Acosta, 2020).¹⁰

The present study exploits the panel nature of the two years,2013/14 and 2015/16, nationallyrepresentative Ethiopian socio-economic survey data. While the labour participation decision model employs both the fixed and random effect estimation techniques to the logit model, the Tobit model for the hours worked applied a random effect estimation technique.¹¹ Finally, due to the absence of a fixed-effect estimation technique for panel probit, the logit model is preferred over the probit model.

The variable representing hours worked per week is a zero-inflated continuous dependent variable censored from the left by substantial zero values. Estimating the model for such a non-normally distributed variable through OLS will lead to biased and inconsistent coefficient estimates. Thus, the left-censored Tobit model is applied after winsorizing the outliers in the data.¹² As a result, all observations with hours worked above 150 per week are substituted by 150 hours.

Finally, following the approach of Kroeger and Anderson (2014), all functions are made to include a time dummy so as to control the influence of time-varying unobservable. Moreover, all models are made to control household wealth and a variable representing household exposure to a shock during the year before the data collection period.¹³ These variables are assumed to be the most influential variables leading to sample selection and endogeneity bias if they are omitted from the models of labour participation and hours worked.

5. Estimation and result discussion

5.1. Impact of remittances on labour participation decisions

Table 3 shows results estimated from the logit model to examine the impact of remittancereceiving (foreign or domestic) status on the adult and children labour participation decisions of left-behinds in Ethiopia. In Table A1, the same models are again estimated using the per adult equivalent amount of remittances for a robustness check. In both approaches, the fixed and random effect estimation techniques are applied to the total and sub-sample estimations.

A robust primary finding of this study is that holding all other factors constant, the labour participation decisions of adults living in foreign remittance-receiving households is significantly lower than their counterparts in the non-receiving households. In theory, such an outcome arises due to different reasons. The first reason could be if the foreign remittance income increases the reservation wage of adults in the receiving households above the prevailing market wage rate, it leads to a decrease in the labour participation of adults. Second, migration returns may be better for better-educated migrants. As a result, the foreign remittance income may encourage the leftbehinds to attend further education by decreasing their participation in non-domestic activities. Third, due to the asymmetric information between the sender(s) and the receiver(s), the foreign remittance income may result in moral hazard problems such as dependency on the remittance income and lack of willingness to work. Hence, labour participation decreases.

Sub-sample results in columns (8) and (9) of Table 3 show that labour participation is lower for both 15–25 and 26–64 age group adults living in foreign remittance-receiving households. This result could suggest that the positive effect on education, reservation wage, and dependency on private transfer incomes can be potential reasons for the lower participation of adults. As reported in Table A4, adults both in the age group 15–25 and 26–64 in foreign remittance-receiving households have a significantly higher level of education than their counterparts in non-receiving families. Hence, the lower adult labour participation in the foreign remittance-receiving households could be due to the positive effect on education. Mughal and Makhlouf (2013) in Pakistan also showed that the negative impact of foreign remittances on the labour participation of adults in the age group15–25 is due to the positive effect on education.

Further results produced under columns (4) and (6) reveal that the labour participation decisions of adult females and urban residents significantly decreased in foreign remittance-receiving households than their counterparts in the non-receiving. This result implies that the impact of foreign remittances on the labour participation decisions of adults is sensitive to gender and residential location.

Female labour participation in non-domestic labour activities may decrease due to different reasons. The first reason can be an intrahousehold labour reallocation to domestic household activities. Because most domestic household duties in Ethiopia, such as child care and home production, are performed by women, a higher household income due to the foreign remittances could increase female reservation wage rates and decrease participation in non-domestic activities. Besides, as shown in Table A4, compared with females living in foreign remittance non-receiving households, females living in the receiving households have a higher level of education. Thus, the labour participation of adult females could reduce by either raising the reservation wage rate or enhancing further education. This finding is consistent with Asiedu and Chimbar (2020) and Azizi (2018).

Similarly, the depressing effect of foreign remittances on the labour participation decision of urban adults could also be due to a higher reservation wage, dependency, or education effects. The result contradicts Asiedu and Chimbar (2020), in the case of Ghana, which finds the depressing effect is larger for rural adults and Nwokoye et al. (2020) in Nigeria, which finds labour force participation increases in urban areas. However, due to the limitation of the survey data employed

Table 3. Fixed Labor Participo	Effect (FE) and F ation decision (Ll	Random Effect (R Pd)	E) logit results:	Remittance rec	eiving status (1=	:Yes) is the key i	independent vaı	riable and depen	dent variable:
	(1)	(2)	(3)	(†)	(5)	(9)	(2)	(8)	(6)
	Total sample FE	Total sample RE	Male RE	Female RE	Rural RE	Urban RE	Age 7-14 RE	Age 15-25 RE	Age 26-64 RE
Receiving foreign remittances	29***	19***	11	26***	.03	38***	16	20**	18**
	(.1)	(.05)	(80.)	(.07)	(.08)	(.08)	(.11)	(60.)	(.07)
Receiving domestic remittances	.03	02	01	04	.16***	21***	05	0.00	.05
	(.07)	(.04)	(90.)	(.05)	(90)	(90)	(.07)	(90)	(.05)
sex	.83***	.77***			.92***	.52***	.6***	.64***	.85***
	(.05)	(.03)			(.04)	(:05)	(.05)	(90)	(.04)
Age	.02***	.02***	.02***	.02***	.01***	.04***			
	(00.0)	(00.0)	(0.00)	(00.0)	(00.0)	(0.00)			
Years of schooling	.01	.01**	0.00	.02***	03***	.04***	.1***	02***	.01***
	(.01)	(00.0)	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
Head Sex	.12*	.1***	.39***	11**	.07	.13**	.19***	.06	.04
	(90.)	(.03)	(90')	(.05)	(.05)	(.05)	(90')	(.05)	(.05)
Head Age	01***	01 ***	01***	01***	01 ***	02***	**00	**00	01 ***
	(00.0)	(00.0)	(00.0)	(00.0)	(00.0)	(00.0)	(0.00)	(00.0)	(0.00)
Household Size	.01	02**	03**	01	02**	01	07***	05***	02**
	(.01)	(.01)	(.01)	(.01)	(.01)	(.02)	(.01)	(.01)	(.01)
Working male	10***	08***	09***	04**	1***	04	02	03	06***
	(.02)	(.01)	(.02)	(.02)	(.02)	(.02)	(.02)	(.02)	(.02)
									(Continued)

Table 3. (Contin	ned)								
Working Female	00.0	01	.02	06***	02	.03	***60.	.01	:03
	(.03)	(.02)	(:03)	(.02)	(.02)	(.03)	(.03)	(:03)	(.02)
Paeq. Consumption exp.(log)	.22***	.1***	.14***	*90.	.11***	.04	.32***	.17***	.06*
	(.05)	(.02)	(+0.)	(.03)	(.03)	(.04)	(.04)	(+0.)	(:03)
Wealth	00.0	01	0.00	01	.05***	04 ***	2***	06***	0.00
	(.01)	(.01)	(.01)	(.01)	(.02)	(.01)	(.02)	(.01)	(.01)
Shock occurrence	.15***	.03	90.	.01	.04	02	.17***	, 00	.01
	(.05)	(.03)	(+0.)	(+0)	(+0.)	(.05)	(.05)	(.05)	(.04)
Rural dummy	.42***	.66***	.81***	.55***			1.67***	.82***	.5***
	(.08)	(.04)	(.07)	(90.)			(.1)	(.07)	(.06)
Year dummy	.11***	.08***	.15***	.03	01	.22***	.12***	*60.	.11***
	(+0.)	(.03)	(+0-)	(.04)	(.04)	(.05)	(.05)	(.05)	(.04)
cons		-1.42***	-1.22***	9***	22	-1.66***	-5.81 ***	-2***	19
		(.24)	(.37)	(.32)	(.31)	(++)	(.41)	(+;)	(.31)
/lnsig2u		-5	-2.38*	-7.02	-3.02**	-8.24	-1.46**	-2.03*	67'6-
		(7.12)	(1.26)	(97.93)	(1.48)	(396.63)	(.57)	(1.05)	(1128.83)
Observations	8104	25057	11885	13172	16290	8767	11193	9864	15193
Pseudo R ²	60.	.055	.052	.022	.041	.069	.110	.060	.045
Wald chi2		1429.20	532.77	339.63	684.10	516.84	728.17	450.31	652.25
LR chi2	525.77								
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Standard errors are	in parenthesis and	for the random effe	ict models, they are	cluster-robust stand	lard errors. *** $p < .0$	11, ** p < .05, * p < .1			

in this study, we could not explore whether the lower participation of adults in the foreign remittance-receiving households is exactly due to the effect on the reservation wage rate, moral hazard or education effects.

Further examinations in Tables 4 A2 and shows that adults living in a foreign remittancereceiving household significantly decrease labour participation in non-agricultural household activities and non-temporary paid jobs. This result could be due to the foreign remittance income is used for self-employment or the establishment of their own enterprise. But this study could not identify the impact on self-employment or own business establishment due to the lack of data on the variables. However, previous studies such as Mughal and Makhlouf (2013) in Pakistan examined the impact of foreign remittances on the probability of self-employment and cultivating own land and found the positive effect is higher in the recipient households. Schuman, as cited in Ndiaye et al. (2018), also revealed highly educated men in Senegal were more likely to be self-employed and less likely to be wage-employed if they received remittances.

The other finding of this study is that child labour participation decision is not affected by foreign remittance-receiving status or the amount of remittances. In other words, there is no evidence for a significant difference between the labour participation decisions of children (7–14 years old) in foreign remittance-receiving and non-receiving households. The result is consistent with Nguyen and Nguyen (2015) in the case of Vietnam but in contradiction with other findings, such as Acosta (2011), which conclude that foreign remittance reduces child labour participation in Mexico. Although the mean comparison in Table 2 showed that child labour participation is lower in remittance-receiving households than the non-receiving, the regression result could not confirm the same.

Regarding the impact of domestic remittances, the total sample case could not reveal significant differences between the labour participation decisions of adults living in domestic remittance-receiving and non-receiving households. However, keeping all other factors constant, adults living in rural domestic remittance-receiving households have a higher probability of labour participation than their counterparts in non-receiving households. Dey (2021) also reported a similar result in the context of rural India. The result may suggest that domestic remittance is used to increase agricultural activities by providing finance to purchase or lease additional plots of land or increase rural off-farm activities. The higher adult labour participation decisions in the rural domestic remittance-receiving households as compared with adults in the non-receiving could also be due to a shortage of labour force following the migration of a young household member(s) in the receiving households. On the other hand, the labour participation decision of urban adults living in domestic remittance-receiving households. It could again be due to a positive effect on education, a higher preference for leisure among urban adults than rural adults, or the dependency effect.

In terms of occupational choice, adults in domestic remittance-receiving households have a lower probability of labour participation in non-agricultural household activities, while the effect in the temporary paid jobs is positive. The result could be due to domestic remittance is used to search own temporary jobs for the unemployed. The study again could not find any significant effect on the labour participation decisions of children (7–14 years old) living in domestic remittance-receiving households. The result is also robust when the amount of remittances is used as a key variable of interest and is also consistent with the result of Nguyen and Nguyen (2015).

In sum, while foreign remittance or receiving foreign remittance has a negative impact on the adult labour participation decisions in Ethiopia, the effect is also conditional on occupation, gender, and residential location. However, the effect of domestic remittance on the decision to

	11)	10	(2)	11.1	(5)	161	(2)	10/
	(T)	(7)	(c)	(4)	(c)	(0)		(0)
	HHAgr FE	HHAgr RE	HHnon-Agr FE	HHnon-Agr RE	tempaid FE	tempaid RE	Non tempaid FE	Non tempaid RE
Receiving foreign remittances	107	.012	203	*** 744	326	098	422**	263***
	(.147)	(.07)	(.165)	(.092)	(.251)	(.146)	(.17)	(960')
Receiving domestic remittances	.162	.04	.058	182***	019	.237***	.092	.008
	(660.)	(.049)	(.122)	(.064)	(.174)	(60.)	(.143)	(.071)
sex	.873***	.82***	.041	.073	.832***	.846***	.566***	.567***
	(990.)	(.036)	(.091)	(940)	(.146)	(.076)	(.115)	(.062)
Age	.003	.005***	.015***	.018***	003	.004	.032***	.037***
	(:003)	(.001)	(,004)	(.002)	(900)	(:003)	(.005)	(.002)
Years of schooling	056***	059***	038***	051***	016	007	.136***	.173***
	(.01)	(.005)	(.012)	(900:)	(.018)	(600')	(.014)	(800.)
Head Sex	.112	.156***	.023	013	45***	227***	.019	024
	(.083)	(.042)	(.107)	(.053)	(.163)	(.082)	(.128)	(,064)
Head Age	0	003**	018***	024***	006	012***	017***	015***
	(:003)	(.001)	(.004)	(.002)	(.005)	(:003)	(,004)	(.002)
Household Size	.023	.011	.035	.021	046	067***	083**	103***
	(.018)	(600.)	(.027)	(.013)	(.041)	(.02)	(039)	(.019)
Working Male	038	056***	076*	027	135**	069**	11*	102***
	(.029)	(.015)	(.041)	(.021)	(.066)	(.034)	(.06)	(.031)
Working Female	.052	.024	.044	.013	138	07*	.046	019
	(.037)	(.02)	(.052)	(.026)	(60.)	(.042)	(.067)	(.034)

Table 4. (Continued	0							
Paeq. Consumption exp. (log)	.08	620.	.247***	.224***	.045	034	.067	.002
	(.061)	(.028)	(.081)	(860.)	(.122)	(.056)	(.104)	(.05)
Wealth	071***	114***	.123***	.055***	038	042**	036	.042***
	(.025)	(.012)	(.025)	(011)	(.038)	(.019)	(.028)	(.013)
Shock occurrence	.216***	.004	.016	048	.719***	.256***	089	.04
	(.066)	(.032)	(60.)	(++0.)	(.135)	(690)	(.109)	(.055)
Rural dummy	2.035***	2.184***	-1.519***	-1.112***	131	315***	-1.681***	-1.215***
	(.128)	(.066)	(.141)	(690.)	(.199)	(.102)	(.204)	(.088)
Year dummy	.112**	.079**	013	.039	166*	219***	022	.094*
	(.048)	(.032)	(.066)	(.043)	(860.)	(690)	(.082)	(.056)
cons		-3.227***		-2.748***		-2.127***		-3.192***
		(.276)		(.38)		(.576)		(.51)
/lnsig2u		-2.941**		-1.205***		-10.547		-2.165*
		(1.205)		(.442)		(10252.34)		(1.186)
Observations	6646	25057	3292	25057	1300	25057	2492	25057
Pseudo R ²	.261	.219	.218	.069	.142	.037	.363	.260
Wald chi2		2871.03		830.37		274.97		1724.75
LR chi2	1201.21		496.82		127.56		626.27	
Prob > chi2	0.000	0.000	0.000	000'0	0.000	0.000	0.000	0.000
Standard errors are in p	arenthesis and for th	he random effect mod	lels. thev are cluster-ro	obust standard errors.	*** p < .01. ** p < .05.	* p < .1	-	

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participate in the non-domestic labour activity is mixed by residential location. It increases labour participation in rural but decreases in urban. The effect of domestic remittance or remittance-receiving status is also an occupation-specific. Furthermore, child labour is neither affected by the amount of foreign and domestic remittances nor by the remittance-receiving status.

5.2. Impact of remittances on the hours worked

Results reported in Table 5 show various estimations to examine the impact of remittances (foreign and domestic) on the hours worked. To this end, the left-censored Tobit estimation is applied. Estimated coefficients uncover that both adult males and females, urban residents, and adults of both age categories 15–25 and 26–64 living in foreign remittance-receiving households work fewer hours during the week than their counterparts in the non-receiving households. In other words, foreign remittance-receiving status resulted in a negative impact on the hours worked irrespective of gender and the age category of adults.

After holding all other factors constant, the average hours worked by adults living in foreign remittance-receiving households is 4.9 hours less than their counterparts in the non-receiving households. The depressing effect is significantly larger for females than males and the 15–25 age category. While the average hours worked by females in the receiving households, the average difference is 3.8 hours for males. The hours worked substantially decreased for urban adults living in foreign remittance-receiving households as compared with their counterparts in urban non-receiving households. However, no significant difference is reported among adults living in rural areas and children (7–14 years old). The significant depressing impact may be due to its positive effect on education and higher preference for leisure following the remittance income.

Table 5 also reveals a significant difference in the hours worked between adults living in domestic remittance-receiving and non-receiving households. The average hours worked by adults in the receiving households is approximately 5 hours in less. Hours worked decreased for urban adults living in domestic remittance-receiving households as compared with their counterparts living in non-receiving households. Moreover, using the per adult equivalent amount of remittances (in the log form) as a key variable of interest showed that hours worked decrease not only in urban receiving adults but also irrespective of gender and for adults in the 15–25 age category. While the negative impact on the hours worked in non-domestic labour activities can be due to an intrahousehold labour reallocation to domestic household activities, particularly by the female, the negative effect on urban adults and the 15–25 age category may rest on the positive effect in education.

In sum, the study finds that after holding all other factors constant, hours worked by adults living in remittance (foreign or domestic) receiving households decreases as compared with their counterparts in the non-receiving households. A robustness check has been conducted using the per adult equivalent amount of remittances (in the log form) and shown in Table A3. The result confirms the negative impact of remittances (foreign or domestic) on the hours worked regardless of the remittance measurement (categorical or continuous). Our results are found to support the conclusion of Amuedo-Dorantes (2014), Amuedo-Dorantes and Pozo (2012), and Justino and Shemyakina (2012), while it contradicts Posso (2012).

Finally, like the result on the labour participation decisions of children, this study could not find any significant difference in the hours worked between children living in foreign or domestic remittance-receiving households and their counterparts in the non-receiving households. Using the per adult equivalent amount of remittances (in the log form) also provides the same result.

Table 5. Left cen variable: hours w	sored Tobit estima vorked	ation with Random	ι Effect (RE) αppro	aach: remittance r	eceiving status (1	= yes) is the key ir	ıdependent variab	ile and dependent
	(1)	(2)	(3)	(7)	(2)	(9)	(2)	(8)
	Total Sample	Male	Female	Rural	Urban	Age 7–14	Age 15–25	Age 26–64
Receiving foreign remittances	-4.941***	-3.79***	-6.126***	11	-10.702***	-1.648	-5.625***	-4.279***
	(1.007)	(1.372)	(1.488)	(1.191)	(1.944)	(1.773)	(1.734)	(1.231)
Receiving domestic remittances	-1.527**	-1.469	-1.88*	.466	-5.181***	-1.591	-1.474	163
	(.736)	(1.034)	(1.059)	(.833)	(1.493)	(1.169)	(1.263)	(.902)
sex	15.759***			15.782***	15.076***	10.243***	13.546***	16.532***
	(.536)			(.539)	(1.295)	(.71)	(1.048)	(.639)
Age	.361***	.309***	.331***	.096***	1.048***			
	(.021)	(.028)	(.035)	(.021)	(.052)			
Years of schooling	.086	178*	.363***	609***	.959***	1.106***	609***	.161*
	(.071)	(260.)	(.111)	(.083)	(.141)	(.175)	(.125)	(.084)
Head Sex	1.027	6.825***	-3.613***	114	2.26*	2.693***	.483	342
	(.629)	(.981)	(.911)	(.694)	(1.325)	(.981)	(1.071)	(.798)
Head Age	257***	243***	221***	154***	525***	.067**	108***	235***
	(.02)	(.028)	(.031)	(.021)	(.049)	(:03)	(.032)	(.025)
Household Size	34**	431**	132	276**	494	-1.262***	905***	424**
	(.145)	(.192)	(.222)	(.138)	(707)	(.218)	(.262)	(.172)
Working male	-1.225^{***}	-1.453***	657*	-1.419^{***}	718	037	421	809***
	(.235)	(.312)	(.37)	(.234)	(.602)	(.372)	(.429)	(.288)
Working Female	027	.293	868**	344	1.163*	1.581***	.66	.577
	(.3)	(.423)	(.442)	(.313)	(.704)	(.468)	(.529)	(.374)
								(Continued)

	(mail							
	(1)	(2)	(3)	(†)	(2)	(9)	(2)	(8)
	Total Sample	Male	Female	Rural	Urban	Age 7–14	Age 15–25	Age 26–64
Paeq. Consumption exp. (log)	3.949***	4,418***	3.329***	3.929***	2.412**	6.496***	5.386***	3.072***
	(.441)	(.593)	(99)	(++)	(1.121)	(.64)	(.803)	(.518)
Wealth	.319**	.632***	.1	1.384***	379	-3.327***	931***	.722***
	(.148)	(.202)	(.218)	(.234)	(.265)	(.29)	(.256)	(.183)
Shock occurrences	1.538***	1.847***	1.315*	2.471***	959	4.481***	1.784**	1.229**
	(.505)	(.68)	(.754)	(.515)	(1.191)	(.739)	(305)	(.599)
Rural dummy	4.443***	4.326***	4.703***			27.25***	8.114***	.975
	(67.)	(1.075)	(1.17)			(1.451)	(1.403)	(.945)
Year dummy	3.345***	4.257***	2.349***	2.031***	5.872***	4.445***	4.619***	3.19***
	(.509)	(.685)	(.762)	(.523)	(1.214)	(.744)	(.915)	(.605)
cons	-36.968***	-26.587***	-31.442***	-19.366***	-48.034***	-107.142**	-53.32***	-11.456**
	(4.358)	(5.852)	(6.557)	(4.474)	(11.228)	(6.348)	(7.843)	(5.104)
/sigma_u	3.179	5.551**	3.86	4.485***	0	8.173***	9.129***	2.988
	(2.487)	(2.618)	(4.584)	(1.709)	(10.654)	(1.899)	(2.712)	(3.692)
/sigma_e	34.878***	32.991***	36.633***	28.742***	47.125***	30.031***	36.604***	32.978***
	(.324)	(.524)	(.61)	(.346)	(.598)	(.621)	(.795)	(.427)
Observations	25,057	11,885	13,172	16,290	8767	11,193	9864	15,193
Pseudo R ²	.011	.008	.004	.012	.017	.032	600.	.012
Wald chi2	1814.06	683.69	294.67	1320.32	819.11	1320.32	492.06	1306.76
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Standard errors are i	n parenthesis and for t	the random effect mo	dels, they are cluster-r	obust standard errors.	*** p < .01, ** p < .05,	* p < .1		

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6. Conclusions

Labour participation decisions and hours worked are among the most important determinants of production and productivity. However, the way remittances affect labour participation decisions and hours worked has been indeterminate. This study examined the impact of remittances (foreign and domestic) on the labour participation decisions and hours worked in Ethiopia using panel data extracted from the Ethiopia socio-economic Survey (ESS). The study applied logit and Tobit models with fixed and random effect estimation techniques, and robustness checks have been conducted with a different measurement scale of remittances (categorical versus continuous).

This study finds that keeping all other factors constant, remittances in Ethiopia (foreign or domestic) decreased adult labour participation decisions and hours worked except for adults living in rural domestic remittance-receiving households. Living in rural domestic remittance-receiving households increased the labour participation decision of adults, while the impact is still negative on urban adults. Moreover, this study could not find any significant impact of remittances (foreign or domestic) on child labour participation decisions and hours worked.

This study also revealed that the negative effect of foreign remittances on labour participation decisions and hours worked is larger than the effect in domestic remittance-receiving households. The result can be due to the mixed impact of domestic remittances in urban and rural while the impact of foreign remittance is consistently depressing in both urban and rural labour participation decisions. Besides, the potential of foreign remittances to create a dependency effect can be larger than domestic remittances due to the larger size of foreign remittances in amount.

The study also finds that the impact of foreign remittance-receiving status on adult labour participation decisions and hours worked is significantly heterogeneous by gender and residential location. But only residential location matters for domestic remittances to have different effects on labour participation decisions and the hours worked. Furthermore, the impact of remittances (foreign and domestic) is occupation-specific. Living in a remittance-receiving household decreases labour participation decisions in a non-agricultural household activity. Adult labour participation in non-temporary paid jobs also decreases due to foreign remittance-receiving status, but domestic remittance increases the participation of adults in temporary paid jobs.

This study suggests that the negative impact of remittances on labour participation decisions and hours worked could be due to the dependency effect (moral hazard problem). Thus, adults in remittance-receiving areas need special attention from the government and stakeholders. Behavioural and skill-based(entrepreneurial) training on the ways remittances could be diverted to more productive use is highly useful. We also find domestic remittances increased adult labour participation in rural areas and participation in temporary paid jobs. Therefore, working hard on financial institution expansion, improving roads, telecommunication services and internet infrastructure in rural areas is crucial to increasing domestic remittances. However, this study strongly suggests the need for a further study to identify the exact causes of the negative effects of foreign and domestic remittances on adult labour participation decisions and hours worked. Is that because it increased the reservation wage rate, education or dependency needs an appropriate exploration for a timely intervention. In addition, whether adults in remittance-receiving households use the remittances for self-employment, own business enterprise establishment etc., needs to be addressed.

Acknowledgements

Author details

The authors would like to thank the Editor and the anonymous referee.

Funding

The authors received no direct funding for this research.

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Citation information

Cite this article as: Do remittances affect labour participation decisions and hours worked? Evidence from Ethiopia, Haile Ademe Ayalew & Pratap C. Mohanty, *Cogent Economics & Finance* (2022), 10: 2093821.

Notes

- Reservation wage rate is the minimum wage rate at which a worker would be willing to accept employment (Borjas, 2016).
- ESS2 and ESS3 are the second and the third Ethiopian Socio-economic Survey (ESS) conducted in 2013/14 and 2015/16. ESS is a collaborative project between the Central Statistics Agency of Ethiopia (CSA) and the World Bank Living Standards Measurement Study (LSMS) with the objective of availing panel data for researchers and policymakers.
- 3. Our study considers labour participation decision and hours worked in non-domestic activities.
- 4. Full derivation of the first-order condition is available with authors and can be send upon request.
- Detail discussions on the disincentive, education and substitution effect of remittances are available in the background section.
- 6. 18,379 individuals of age 7–64 and 18,127 individuals of the same age group were interviewed in 2013/14 and 2015/16 survey years, respectively.
- Remittance in the ESS module includes all kinds of private transfers in the form of cash and in-kind converted into monetary values.
- 8. The approach has three advantages. First, due to recall problems, significant errors are most likely to occur in the measurement of remittance amounts. Second, since the questionnaire is mainly administered to the household head if another member receives the remittance, the head may recall the remittance receipt but may not accurately recall the amount of remittance. Third, dealing with impacts of living in a remittance-receiving household or not helps to capture if the absence of a remittance sender member due to the migration cause any positive or negative effect other than the effect of the remittance.
- 9. ETB is Ethiopia's official currency called Ethiopian Birr and the conversion rate into \$ applied the simple average of the two-year weighted average exchange rates. 1 USD in 2013/14 and 2015/16 was ETB 19.07 and 21.10, respectively (National Bank of Ethiopia, 2013 and 2015 reports). Thus, the two-year average exchange rate is ETB 20.08.
- 10. The shock variable is used to control if shocks that occur during the year prior to the data collection period affect the remittance inflow and labour market outcomes. The most important shocks can be agricultural product loss, wealth or income loss, health related shocks etc.
- 11. Due to the lack of variability in many of the dependent variable observations, a substantial number of observations are found to be dropped from the fixed-effect estimation technique. Hence, the random effect result is added for result constancy check.
- 12. Winsorization is the replacement of outlier observations with a limiting extreme value. Because it avoids loss of observations, it is an important strategy of treating outliers than trimming.

13. Wealth as an important household variable for miaration and remittance selection is controlled through an index predicted by the principal component analysis (PCA) method. The prediction used several assets from household durables and housing characteristics. From household durables, we used Kerosene stove, Butane stove, Electric stove, Blanket, Mattress, bed, Watch/clock, Telephone, Cell phone, Radio, tape, TV, Dish antenna, Sofa, Bicycle, Motorbike, Cart (hand), Animal cart, sewing machine Weaving equipment, Mitad-electric, Mitad-modern, Refrigerator, Car, Gold/silver, Wardrobe, Storage shelf, Biogas stove, Water storage pit, Sickle, Axe, Pick Axe, Plough, Plough (modern) and Water pump. The following indicators are used for housing characteristics: Floor, Wall, Kitchen, Roof, Light source, Toilet, Number of rooms, Drinking water, cooking fuel and Own home

Disclosure statement

No potential conflict of interest was reported by the author(s).

Statement on data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Appendix





	(1)	(2)	(3)	(†)	(2)	(9)	(2)	(8)	(6)
	Total SampleFE	Total SampleRE	MaleRE	FemaleRE	RuralRE	UrbanRE	Age 7_14RE	Age 15_25RE	Age 26_64RE
Paeq.foreign remittances(log)	043***	031***	018	042***	.003	053***	023	**60	031***
	(.014)	(.008)	(.012)	(.01)	(.012)	(.01)	(.016)	(.012)	(.01)
Paeq.domestic remittances(log)	01	018***	015	023***	.02*	043***	022	016	001
	(.012)	(.007)	(.011)	(600')	(.011)	(600')	(.014)	(.01)	(600')
Year dummy	.111***	.082***	.151***	.034	-000	.219***	.123***	*60.	.113***
	(.038)	(.028)	(.043)	(.038)	(.036)	(.048)	(.046)	(.046)	(903)
cons		-1.413***	-1.215***	887***	239	-1.629***	-5.818***	-1.992***	193
		(.241)	(.374)	(.322)	(.307)	(+++)	(.411)	(399)	(602.)
/Insig2u		-5.197	-2.4*	-7.095	-3.023**	-8.279	-1.435**	-2.021*	-9.497
		(8.663)	(1.281)	(105.826)	(1.481)	(414.061)	(.558)	(1.04)	(1134.328)
Observations	8104	25,057	11,885	13,172	16,290	8767	11,193	9864	15,193
Pseudo R ²	.094	.055	.052	.022	.041	.070	.110	.060	.046
Wald chi2		1438.13	534.38	346.17	682.32	520.91	728.82	450.03	654.28
LR chi2	527.63								
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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Table A2. Fixed I variable and dep	Effect (FE) and Rar pendent variable: L	ndom Effect (RE) l abor Participatio	ogit estimation by n decision(LPd)	occupation type: I	² er adult equivale	nt amount of rem	ittances(log) is the	e key independent
	(1)	(2)	(3)	(†)	(5)	(9)	(2)	(8)
	HHAgrFE	HHAgrRE	HhnonAgrFE	HhnonAgrRE	TempaidFE	TempaidRE	Non tempaidFE	Non tempaidRE
Paeq. foreign remittances(log)	013	002	029	062***	047	018	061***	038***
	(.022)	(.01)	(.023)	(.012)	(.034)	(.021)	(.022)	(.013)
Paeq. Domestic remittances(log)	.024	002	015	048***	028	.021	.003	-009
	(.018)	(600')	(.02)	(.01)	(:03)	(.014)	(.022)	(.011)
Year dummy	.112**	.08**	012	.04	168*	216***	021	.095*
	(.048)	(.032)	(.066)	(.043)	(860.)	(.069)	(.082)	(.056)
cons		-3.233***		-2.718***		-2.122***		-3.164***
		(.276)		(.38)		(.576)		(.51)
/lnsig2u		-2.936**		-1.209***		-10.452		-2.187*
		(1.199)		(.441)		(9415.522)		(1.212)
Observations	6646	25,057	3292	25,057	1300	25,057	2492	25,057
Pseudo R ²	.261	.219	.218	.070	.143	.036	.363	.260
Wald chi2		2876.04		836.20		270.83		1728.08
LR chi2	1200.21		497.32		128.61		627.41	
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0000
Standard errors are i	n parenthesis and for t	the random effect mo	dels, they are cluster-ro	obust standard errors.	*** p < .01, ** p < .05,	* p < .1		

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Table A3. Left c and dependent	ensored Tobit estin variable: Hours work	nation with Rand ked	om Effect (RE) app	ıroach: Per adult e	quivalent amount	of remittances (I	og) is the key inde	ependent variable
	(1)	(2)	(3)	(†)	(2)	(6)	(2)	(8)
	Total Sample	Male	Female	rural	Urban	Age 7_14	Age 15_25	Age 26_64
Paeq.foreign remittances(log)	792***	574***	-1.014***	097	-1.47***	241	893***	708***
	(.142)	(.195)	(.209)	(.182)	(.258)	(.264)	(.249)	(.172)
Paeq.domestic remittances(log)	512***	457**	629***	033	-1.079***	437*	521**	179
	(.124)	(.179)	(.175)	(.162)	(.224)	(.226)	(.208)	(.156)
Year dummy	3.348***	4.252***	2.363***	2.04 ***	5.895***	4.429***	4.64 ***	3.184***
	(.509)	(.685)	(.761)	(.522)	(1.213)	(.75)	(.914)	(.605)
cons	-36.8***	-26.447***	-31.351^{***}	-19.559***	-47.342***	-107.337**	-53.103***	-11.462^{**}
	(4.356)	(5.85)	(6.551)	(4.473)	(11.22)	(6.339)	(7.839)	(5.103)
/sigma_u	3.168	5.549**	3.726	4.482***	0	0	9.128***	3.014
	(2.493)	(2.618)	(4.742)	(1.711)	(10.552)	(.031)	(2.714)	(3.662)
/sigma_e	34.862***	32.982***	36.617***	28.74***	47.085***	31.122***	36.585***	32.967***
	(.324)	(.524)	(609)	(.346)	(.597)	(.372)	(.795)	(.427)
Observations	25,057	11,885	13,172	16,290	8767	11,193	9864	15,193
Pseudo R ²	.011	.008	.004	.012	.017	.032	600.	.012
Wald chi2	1833.16	689.28	310.30	1320.51	830.33	1320.77	498.37	1313.24
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Standard errors are	in parentheses. *** p < .(01. ** p < .05. * p < .1						

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Note: All control variables included in Table 3 are also included to estimate Table A3 but removed from the table to save space.

Table A4. Comparison of Years of Schooling by gender and age group: An Independent twosample t-test

	Fo	reign remittar	nce	Dor	nestic remitto	ince
Variable	Non- Receiving	Receiving	diff.	Non- Receiving	Receiving	diff.
Female	3.13	5.24	(2.11)***	3.11	4.27	(1.16)***
Male	4.12	6.10	(1.97)***	4.12	5.10	(.98)***
Age 7–14	2.04	2.71	(.66)***	2.05	2.26	(.21)***
Age 15–25	5.77	7.34	(1.57)***	5.68	7.09	(1.40)***
Age 26-64	3.40	5.99	(2.58)***	3.45	4.33	(.87)***

Note: "diff." represent the mean difference. ***, **, * refers to the difference is statistically significant at 1%, 5%, and 10% respectively. The null and alternative hypotheses are H0: diff = 0, and Ha: diff # 0, respectively.



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