Remittances, Labour Supply and the Functional Income Distribution[*]

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Preliminary and Incomplete. Comments Welcome.

Abstract

This article investigates how remittance inflow affects labour supply decisions and by extension, the functional income distribution. First, the remittance-income effect on labour supply reduces labour's share in national income and serves as a new source of functional income inequality. Second, remittance inflow prices labour out of the labour market or increases labour's reservation wage; leading to structurally low labour force participation rates. Third, the article demonstrates that when the remittance-income effect dominates, remittances are growth intensive. However, these results are reversed when leisure is an inferior good, so that remittance inflow increases the wage share and work effort but reduces growth in an open economy. To prevent the adverse effects of remittance inflow, the article recommends policy that induces work effort for remittance recipients. These range from social policies to reduce labour market discrimination, school internship programs, higher minimum wages and easier access to credit for small businesses. Finally, the article recommends expanding and diversifying the tradable sector so that increases in remittance inflow and work effort are consistent with economic growth.

1   Introduciton

What is the role of international remittances in the economic development of recipient countries? Answers to this question usually relate to the growth implications and democratic dividends from remittances. The evidence on the growth effects of remittances is inconclusive and research on its democratic dividends are only now emerging. The role of remittances in shaping a country's income distribution is not less divided—see Rapoport and Docquier (2005), Milanovic (1987) and Koechin and Leon (2006) for a treatment on this issue.

What explains the conflicting results? This article shows that how remittances affect both growth and distribution depend on how it influences the labour supply decision. Remittances are growth intensive when remittances reduce labour's share in national income as labour chooses leisure over work. The lower wage share increases external competitiveness—a key ingredient for economic growth in small and open economies. However, when leisure is an inferior good, so that remittances induce work effort, wage share increases and crowds out external price competitiveness and economic growth. Much of the literature that focuses on economic growth and and remittances fail to take into consideration the effects of remittances on income distribution and how this affects the growth process.

This article makes a second contribution on the determinants of the functional income distribution. The received wisdom is that bargaining power, foreign exchange rate, the level of economic activity and firms' degree of monopoly are key determining factors. Using a model that reproduces these insights, the paper illustrates that remittance inflow is an important contributory factor. Moreover, given that the final result is contingent on the work-leisure choice, it is no surprise that the literature on remittances and economic development is divided. Remittances may produce more egalitarian growth processes in countries with strong work ethic or countries that devise strategies to induce work effort. Since these are not symmetrically distributed across space and time, researchers will find conflicting results. The preferred outcome is to have remittances induce work effort so that functional income inequality can be reduced. But this requires strategic policy to increase the costs of the leisure choice. Moreover, remittances and policies that that promote egalitarianism can reduce economic growth in small and open economies. Therefore, in addition to policies that promote work effort, industrial policies are needed to expand and diversify the tradable sector.

The remainder of the paper is organized as follows. Section II presents the theoretical

model along with findings and section III concludes by way of a discussion.

2 Model

2.1 Labour Supply Decision

Consider an individual i with utility function $U_i(y_i, l_i)$, where y_i and l_i are income and leisure hours respectively. Let $l_i = t_i - h_i$—the difference between the individual's total time endowment t_i and total hours worked in wage employment h_i. The individual's budget constraint is $y_i = w + v_i$, where w and v_i are hourly wage and non-labour income respectively. The objective maximization problem and the first order conditions are as follows: Lagrangian $\mathcal{L}_i = U_i(y_i, l_i) + \lambda(wt_i + v_i - y_i - wl_i) = 0$. We arrive at an internal solution given that $U_{li}/U_{yi} = w$ and this leads to an optimal labour supply function of $h_i = h_i^*(w, v_i)$.

$$\mathcal{L} = \begin{cases} \mathcal{L}_{yi} = U_{yi} - \lambda = 0 \\ \mathcal{L}_{li} = U_{li} - \lambda w = 0 \\ \mathcal{L}_\lambda = wt_i + v_i - y_i - wl_i \end{cases} \tag{1}$$

The comparative static of interest is $\partial h_i / \partial v_i < or > 0$. If leisure is a normal good then increases in non-labour income reduces h_i, while the reverse holds if leisure is an inferior good. Further, if $\partial h_i / \partial v_i < 0$, it follows that as non-labour income increases so does the individual's reservation wage w_i^*, where $w > w_i^*, h_i > 0$ and $w < w_i^*, h_i = 0$ hold. Consequently, the size of the labour force Z is inversely related to aggregate non-labour income: $Z = \frac{1}{V}$, where $V = \sum_{i=1}^{n} v_i$. As w^* rises relative to market wage, non-participants in the labour force will remain non-participants and some participants may opt to leave. Conversely, the individual's reservation wage falls if l_i is an inferior good, thus, Z is a positive function of non-labour income. Finally, the standard comparative static of a backward bending labour supply $\partial h_i / \partial w >$ and < 0 also holds.

2.2 Firm

Assume that firm j has a production technology of the form $Q_j = f(\ell_j, m_j)$, where ℓ_j and m_j are total labour hours the firm hires and intermediate inputs respectively. The domestic good Q_j may be exported or consumed locally. For simplicity the model does not take into

consideration depreciation of labour productivity or intermediate inputs. The firm's pricing strategy is a mark up τ_j over unit labour cost $\frac{w}{\theta_j}$ and intermediate input cost ep_{mj}. Costs of intermediate inputs are the sum costs of domestic and imported capital $ep_{mj} = p_k^d + p_k^i m$, where e is the nominal exchange rate. Labour productivity in firm j is θ_j and the firm's mark up is determined by the degree of its monopoly.

$$p_j = (\tau_j)\frac{w}{\theta_j}(ep_{mj}) \tag{2}$$

Following Marglin and Bhaduri (1990) and Taylor (2004b), the firm's investment function $g_j = I/K$ is as follows, where π, μ_j, φ_j are profit share, capacity utilization and animal spirits respectively. This function captures the three basic determinants of investment: profitability as represented by profit share, aggregate demand (capacity utilization) and the state of business confidence (animal spirits).

$$g_j = f(\pi, \mu_j, \varphi_j), \qquad f_\pi, f_{\mu j}, f_{\varphi j} > 0 \tag{3}$$

2.3 Goods Market Equilibrium

Assume that only profit income is saved and the saving ratio σ is S/K. The saving function can be written as shown in (4), with saving rate s and the function is multiplied by μ for proportionality to the capital stock. Further, consider a current account balance as a ratio to capital stock $b = CB/K$ as shown in (5), where $b_{\mu h}, b_{\mu f}, b_{NUT}, e^*$ are domestic and foreign capacity utilization, net unilateral transfers and real exchange rate respectively. Current account balance is the sum of exports and net unilateral transfers less imports: $X + NUT - e^*IM$.

$$\sigma = (s\pi)\mu \tag{4}$$

$$b = b(\mu_h, \mu_f, NUT, e^*), \qquad e^* > 0, b_{\mu h} < 0, b_{\mu f} > 0, b_{NUT} > 0 \tag{5}$$

The goods market equilibrium condition with no government is $\sigma = b + G$, where $G = \sum_{j=1}^n g_j$. In this economy with no government, aggregate savings are used to finance investment and the current account balance. Any excess of investment over domestic savings is financed by the inflow of foreign savings. The goods market implicit solution is as follows.

$$(s\pi)\mu = f(\pi, \mu, \varphi) + b(\mu_h, \mu_f, NUT, e^*) \tag{6}$$

The Keynesian stability condition is found by analyzing the conditions for adjustments in the utilization rate to eliminate excess demand for goods (EDG), where $EDG = b + G > \mu$. For short run stability, $\frac{\partial EDG}{\partial \mu} = f_\mu + b_\mu - s\pi < 0$ must hold. In plain terms, as capacity utilization expands, there must be a greater response of savings from profits than increases in investment, so that excess demand is eliminated. Moreover, $\frac{\partial b}{\partial \mu} < 0$ so that the openness of the economy engenders stability as capacity utilization expands—this is achieved through increases in imports—further reducing excessing demand.

Given that (6) is a general function, there is no explicit solution for μ but we can derive the slope. Totally differentiating (6) with respect to μ and the wage share $\alpha = 1 - \pi$, we obtain:

$$\frac{\partial \mu}{\partial \alpha} = \frac{s\mu - f_\pi}{s\pi - f_\mu - b_\mu} \tag{7}$$

The denominator must be positive given the stability condition but the numerator can be either positive or negative. Wage and profit led demand regimes are observed when $\frac{\partial \mu}{\partial \alpha} > 0$ and $\frac{\partial \mu}{\partial \alpha} < 0$ hold respectively. Conditions for wage and profit led growth regimes are as follows. A relatively large utilization effect on investment and high saving engender wage led growth $\frac{\partial G}{\partial \alpha} > 0$, while a relatively large profitability effect on investment and greater openness to imports lead to profit led growth $\frac{\partial G}{\partial \alpha} < 0$.

$$\frac{\partial G}{\partial \alpha} = \frac{s(f_\mu \mu - f_\pi \pi) - f_\pi(b_\mu)}{s\pi - f_\mu - b_\mu} \tag{8}$$

2.4 Functional Income Distribution

Aggregate income Y that can be divided into total wages wH and profits Π as follows.

$$Y = wH + \Pi, \qquad \text{where } H = \sum_{i=1}^{n} h_i \tag{9}$$

Aggregate profit is total income less labour and intermediate input costs $PY - (wH + eP_m)$, where eP_m is aggregate cost of intermediate inputs. Equation (9) can be rewritten as shown in (10). Aggregating equation (2) across all firms leads to an aggregate price level of $P = (\tau)\frac{wH}{\Theta}(eP_m)$, which shows that the price level is determined by aggregate unit labour

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cost, costs of intermediate inputs and firms' mark up. After substituting this into (10), equation (11) is derived.

$$Y = wH + [PY - (wH + eP_m)] \tag{10}$$

$$Y = wH + [(\tau)\frac{wH}{\Theta}(eP_m)]Y - (wH + eP_m) \tag{11}$$

Now dividing both sides of equation (11) by the wage bill wH and taking the inverse lead us to the wage share $\frac{wH}{Y} = \alpha$. Equation (12) shows that a higher hourly wage, growth in labour productivity Θ or an increase in aggregate hours worked H lead to a higher wage share. While a growth in firms' mark up, nominal exchange rate depreciation or an increase in the level of economic activity lower the wage share.

$$\alpha = \frac{wH\Theta}{[(\tau)(eP_m)]Y - eP_m} \tag{12}$$

Given that $H = \sum_{i=1}^{n} = \sum_{i=1}^{n} t_i - \sum_{i=1}^{n} l_i$, the wage share can be expressed in terms of aggregate time endowment T and leisure hours L, so that $\frac{\partial \alpha}{\partial L} < 0$ holds. Equation (13) demonstrates how the labour decision on the intensive margin affects the wage share. But the decision to join or not join the labour force Z is also consequential. To see this let us write Z in hours: $H^* = H' + H$—total work hours available in the labour force H^* are the sum of total hours worked H and total work hours available in the pool of unemployed H'. Rewriting H as $H^* - H'$ and substituting into equation (12) lead to the following. Equation (14) shows that the wage share is a positive function of labour force hours (read size of the labour force) but negatively related to the number of unemployed labour hours.

$$\alpha = \frac{(wT - wL)\Theta}{[(\tau)(eP_m)]Y - eP_m} \tag{13}$$

$$\alpha = \frac{w(H^* - H')\Theta}{[(\tau)(eP_m)]Y - eP_m} \tag{14}$$

Theorem 1 *Non-labour income V is an important determinant of labour supply and consequently, the aggregate wage share α.*

Proof.

1. $\frac{\partial \alpha}{\partial L} < 0$, V reduces the wage share if leisure is a normal good, recalling that $\partial h_i / \partial v_i < 0$, where $h_i = t_i - l_i$. Further, recall that $Z = \frac{1}{V}$, the wage share also falls because of a smaller labour force.

2. $\frac{\partial \alpha}{\partial L} < 0$, V increases the wage share if leisure is an inferior good, recalling that $\partial h_i / \partial v_i > 0$. Given that Z is a positive function of V, the wage share rises as Z increases.

Theorem 2 *In a flexible exchange rate system, remittance inflows engender a nominal exchange rate appreciation and increases the wage share, but the net effect is determined by individuals' labour supply decision.*

Proof.

1. $\frac{\partial \alpha}{\partial e} < 0$, remittances reduce e but have ambiguous effects on work effort $h_i = t_i - l_i$ and the size of the labour force Z.

Theorem 3 *In fixed exchange rate systems, remittances have ambiguous effects on the functional income distribution but only through the labour supply decision channel.*

Proof. This can be demonstrated easily by assuming the nominal exchange is fixed in equation (12). In this case, remittance inflows only affect the wage share through labour supply decisions.

In the work-leisure set up, the individual's choice set is limited but in reality she can choose to invest her non-labour income if it exceeds stipendiary sums and reduce h but increase her time spent in self employment t_{si}. Thus, the time constraint can be reformulated as $t = h + l + t_s$. The individual's budget constraint becomes the the sum of wage income y_w and self employment income y_s: $y_i = y_{wi} + y_{si}$, where y_w is wh_i and y_s is rt_{si}. Assume for simplicity that the hourly return from self employment r is a positive function of non-labour income. The new optimal allocations of labour time are derived from the following Lagrangian $\mathcal{L}_i = U_i(y_i, l_i) + \lambda(wt_i - wl_i - wt_{si} + rt_i - rh_i - rl_i - y_i) = 0$. The internal solution is given by $U_{li}/U_{yi} = w - r$ and this leads to a new optimal labour supply function of $h = h^*(w - r, v_i)$. The opportunity cost of one hour of leisure is the difference between the hourly return from wage and self employment. Aggregate income shown in equation (9) can be rewritten as follows, where the aggregate wage bill is now the sum of aggregate wage and self employment incomes.

$$Y = (wH + rT_s) + \Pi, \qquad \text{where } T_s = \sum_{i=1}^{n} t_{si} \qquad (15)$$

With this modification, the wage share can be rewritten as follows. If leisure is a normal good, increases in V unambiguously reduces the wage share. However, if leisure is an inferior good, the wage share can increase if more labour time is allocated towards wage or self employment.

$$\alpha = \frac{(wH + rT_s)\Theta}{[(\tau)(eP_m)]Y - eP_m} \qquad (16)$$

Why should the wage share be inversely related to the level of economic activity Y? To see this let us substitute equation (15) into (16) and ignore intermediate inputs (or assume their prices are constant.) After some simplification a new formulation for the wage share is derived. Equation (17) shows that the wage share is a positive function of labour productivity and inversely related to firms' markup and the aggregate level of profits. *Ceteris paribus*, the higher the level of profits, the lower the wage share.

$$\alpha = \frac{\Theta}{(\tau)\Pi} \qquad (17)$$

The paper shows that both remittances (through its impact on labour supply) and power relations determine the functional income distribution and equation (17) demonstrates the latter point more clearly. When we logarithmically differentiate equation (17) with respect to time and convert to growth rates, the importance of power conflict is explicitly demonstrated. The differential bargaining power between capital and labour determines how much of the gains from productivity growth are translated into higher wages. If firms' mark up and their profit levels grow at the same rate as productivity, there are no gains in wage share. The rise of income inequality over recent decades in the US, Europe and some countries in the Caribbean and Asia show that this is not unlikely. Thus, there are no automatic forces leading to higher wage shares as productivity grows—bargaining and distributional contestation still remain central determinants of income distribution.

$$\hat{\alpha} = \hat{\Theta} - (\hat{\tau} + \hat{\Pi}) \qquad (18)$$

Though the model abstracts from the role of government, public policy that alters the balance of bargaining power clearly plays a determining role in the functional income dis-

tribution. For example, the politicization of unions on the one hand or the abolition of unions on the other, reduces labour's bargaining power and consequently, wage share. As a response to the slowdown in economic growth since the global financial crisis, numerous countries have established growth and productivity councils. This is important. But in the interest of inclusive development, perhaps distributional councils are warranted to ensure that the gains from productivity growth are equitably distributed.

Countries that are major recipients of remittances can potentially reduce the importance of power struggle in determining the functional income distribution. First, wage employment is largely the point of contestation and this power struggle loses its bite in self employment and leisure activities. Second, remittances increase market wages so long as individuals increase leisure hours or time spent in self employment. The contraction in the supply of wage employment puts upward pressure on market wages and tilts the bargaining power in favour of workers remaining in wage employment. However, if remittances lead to a structural problem of persistently low labour force participation rates because those of working age opt for self employment or leisure; then persistently high market wages might force employers to make the production process less labour intensive. This in turn can reduce the bargaining power of labour. Alternatively, immigration can serve as a remedy and this reduces the bargaining power of domestic labour and in turn engenders immigration backlashes.

In closing, the wage share is given by seven factors, all interrelated:

- Remittance inflow;

- The intensity of the class struggle, through which capitalists and unions clash;

- The degree of monopoly, which the markup reflects;

- The ratio of aggregate prices to intermediate input prices;

- Foreign exchange rate;

- The level of economic activity;

- Labour productivity.

2.5 Dynamics

In the simpler case of the absence of intermediate inputs or where intermediate costs are constant and if we assume a fixed exchange rate (a realistic assumption for small open economies), we can rewrite equation (16) as $\alpha = \frac{(wH + rT_s)\Theta}{\tau Y}$. Further, let $wH + rT_s = \bar{w}\bar{H}$ so that the wage share becomes

$$\alpha = \frac{\bar{w}\bar{H}\Theta}{\tau Y} \tag{19}$$

Let us logarithmically differentiate equation (19) as shown below, where $\hat{\bar{H}} = \phi(V\gamma - V\psi)$. Parameters γ and ψ reflect leisure as inferior and normal goods respectively, so that $V\gamma > V\psi$ and $V\gamma < V\psi$ increases and reduces $\hat{\bar{H}}$ respectively.

$$\hat{\alpha} = \hat{\bar{w}} + \hat{\bar{H}} + \hat{\Theta} - \hat{\tau} - \hat{Y} \tag{20}$$

After substitution, equation (20) becomes as follows.

$$\hat{\alpha} = \hat{\bar{w}} + \phi(V\gamma - V\psi) + \hat{\Theta} - \hat{\tau} - \hat{Y} \tag{21}$$

We now have to specify the rate of change of non-labour income or remittances V. Equation (22) shows that remittance inflow increases when the target wage share α^T exceeds the actual wage share plus the altruism parameter β. Let $\alpha^T = 1 - \pi^T$.

$$\hat{V} = \eta(\alpha^T - \alpha) + \beta \tag{22}$$

We specify the target profit share π^T as follows, where $a_0, a_1 > 0$.

$$\pi^T = a_0 - a_1(H + T_s) \tag{23}$$

The underlying assumption is that the higher the level of employment $H + T_s$, the higher the bargaining power of labour and the lower the target profit share. Given that $\alpha^T = 1 - \pi^T$, we can substitute equation (23) into (22).

$$\hat{V} = \eta(1 - [a_0 - a_1(H + T_s)] - \alpha) + \beta \tag{24}$$

We now have two differential equations (21) and (24) with two unknowns $(\hat{\alpha})$ and $(\hat{V})$ as shown below. The remittance curve (RC) is always downward sloping but the wage share

curve (WSC) can be either upward sloping when leisure is an inferior good ($\gamma > \psi$) or downward sloping ($\gamma < \psi$) when leisure is a normal good. However, the wage share curve is always flatter than the remittance curve when both are downward sloping and the steady state equilbrium is observed when the curves intersect at $\hat{\alpha} = \hat{V} = 0$.

$$\hat{\alpha} = 0 \Rightarrow \hat{\hat{w}} + \phi V \gamma - \phi V \psi + \hat{\Theta} - \hat{\tau} - \hat{Y}$$

$$\hat{V} = 0 \Rightarrow \eta - \eta a_0 + \eta a_1 (H + T_s) - \alpha + \beta$$

Figure 1 shows the dynamic equilibrium of wage share and remittance inflow when leisure is an inferior and normal good in Panel A and B respectively. Panel C depicts the investment and saving (IS) curve for a wage led economy. Initial conditions are α_0, V_0 and μ_0. Now assume that the altruism parameter β has increased, the RC curve shifts to the right in Panel A and B to RC_1 and RC_3 respectively. If leisure is an inferior good, the increase in remittance inflow increases work effort, either through more wage employment of self employment. As such, wage share increases to α_1 as remittances increase to V_1 in Panel A. In a wage led economy, a higher wage share increases capacity utilization but in open economies with a relatively high propensity to import, wage share increases lead to trade deficits. Moreover, higher wage share reduces external competitiveness since open economies are profit led, consequently, the IS curve shifts to the left to IS_2 with a lower capacity utilization rate μ_1. In Panel B, the increase in remittances to V_2 lead to a lower wage share of α_3. In this case, leisure is a normal good and preferable to both wage and self employment. In a wage led economy, a lower wage share is growth intensive and this is demonstrated by a rightward shift in the IS curve to IS_1 with a higher capacity utilization rate of μ_2.

3   Discussion

These conflicting growth results with remittance inflow are consistent with the empirical literature. This article contends that the central explanation for this is whether the WSC is upward or downward sloping. It is standard to assume that leisure is a normal good and under this condition, remittance inflows worsen the functional income distribution. While this maybe growth enhancing for a small and highly open economy, it accompanies significant adverse effects. Prominent among these is a low labour force participation rate—those of

Figure 1: Remittances, Wage Share and Growth
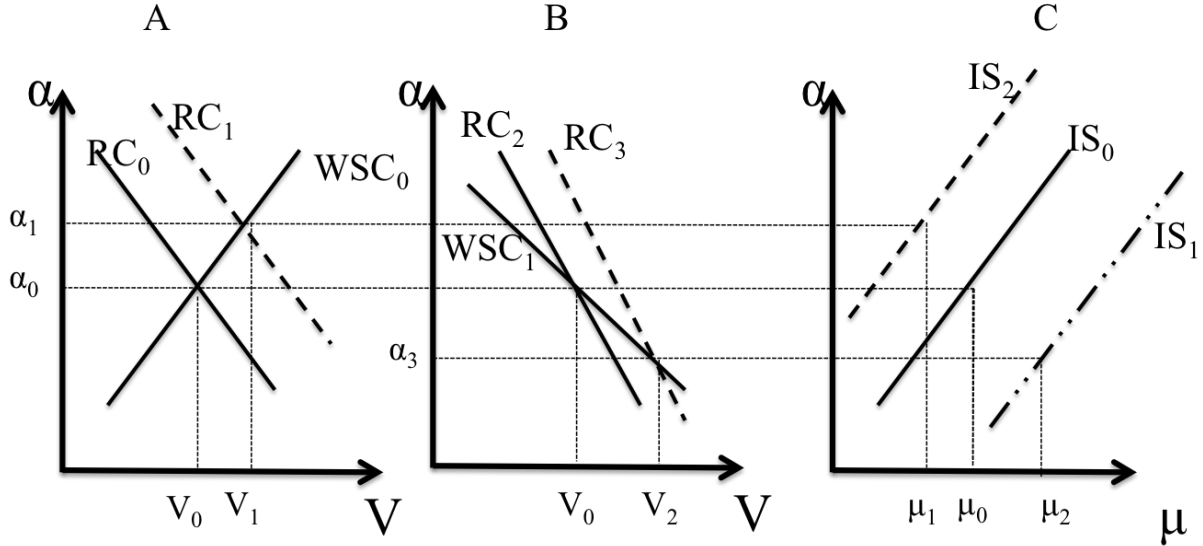
Note: Upward sloping WSC (leisure is an inferior good, $\gamma > \psi$) and the downward sloping WSC (leisure is a normal good, $\gamma < \psi$). The investment and saving curve (IS) is equation (6) and upward sloping, which illustrates a wage led regime and can demonstrate profit led dynamics in an open economy setting by shifts in the IS curve.

working age that opt out of the labour force become career students, migrate, or fall prey to bad company. Loiters are not uncommon in high remittance recipient countries like the those in the Caribbean. Moreover, if high remittance inflows become a permanent feature of small and open developing countries, then wage shares will be structurally low and high income inequality becomes the norm. It follows that the gains from economic growth will be appropriated by small groups—economic distribution becomes undemocratic and as sure as night follows day, politics become elite centric. See Constantine (2017a) for recent evidence of high and entrenched top income shares in CARICOM member states—major recipients of remittances.

If leisure is a normal good, remittances are spent on consumption and given that small and open economies usually have relatively high import propensities—remittances are spent on consumer imports. First, this inhibits domestic productive capacity, second, it reduces scarce foreign currency and finally, it fertilizes a foreign preference. Constantine (2017b) shows that this foreign preference is an important constraint on redistributive policies in small and open economies—redistribution is unsustainable if higher wages are dispropor-

tionally spent on consumer imports. However, if leisure is an inferior good, remittances may improve financial development (Williams (2016)), increase work effort, enhance democratic institutions (Williams and Deonanan (2016)) and reduce inequality. But the net effect of these gains must be measured against a lower growth rate when remittance inflows are directed towards small and open wage led economies.

The principal policy question is how to change individuals' preferences. A key determinant of the work-leisure choice is the relative returns. If market wages are low and the returns from self employment are only marginal; the leisure choice is particularly attractive. It follows that a sufficiently high minimum wage can increase the costs of the leisure choice. Similarly, if small businesses can acquire affordable credit and if the cost of doing business can be lowered; then the costs of the leisure choice increases. Moreover, reducing labour market discrimination can serve as an important attractor to the labour market. In plural societies where labour market discrimination is binding; remittances may serve as an escape valve. Further, introducing internships into the school curriculum can over time engender a work ethic that may prove consequential when graduates are faced with the work-leisure choice.

Policy that can induce work effort for remittance recipients will reduce structural inequality and consequently empower labour. This inevitably leads to contestation as lower inequality can reduce growth in an open wage led economy. However, the optimal solution to this contestation is to change the structure of these economies—by reducing import propensity and expanding and diversifying the tradable sector—rather than reducing wage share. If remittance recipients choose work and engage the formal sector; then they have a stake in their domestic political economy. Thus, if remittance recipients choose work over leisure, then political participation may increase and popular demand to expand and diversify the tradable sector can be represented.

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