What Resource Curse? The Null Effect of Remittances on Public Good Provision

Desiree A. Desierto*

August 12, 2018

Abstract

Existing formal models show that remittances generate a resource curse by allowing the government to appropriate its revenues toward rents, rather than public good provision. Households spend their remittance income on public-good substitutes, thereby alleviating the pressure on the government to provide public goods. However, the process by which the government survives the implicit threat of political challengers remains unspecified. By explicitly modeling political competition, I show that there is actually no resource curse from remittances. When there are challengers who can threaten to replace the incumbent leader, the best that any challenger can do is to offer *not* to take advantage of households' provision of public-good substitutes, which induces the incumbent to try to match the offer. In equilibrium, public good provision is independent of remittances. This result holds even when no challenger can credibly commit to maintaining her offer once she is in power.

*WSD Handa Center for Human Rights and International Justice, Stanford University, and Department of Political Science, University of Wisconsin-Madison; desierto@wisc.edu. I am indebted to Scott Gehlbach for this final version. Earlier versions benefited from comments by Andrew Kydd and Mark Copelovitch, and from discussions with Erica Simmons and set Z members Galina Belokurova, Sarah Bouchat, Dmitry Kofanov, Nathaniel Olin, Diana Oprinescu, Anton Shirikov, and Delgerjargal Uvsh.

1 Introduction

Do remittances generate a political resource curse? While many papers have shown that such a curse exists for oil and natural resources, and even foreign aid and FDI, a fairly recent debate centers on whether the same effect might also be induced by remittance flows. Does the windfall from remittance incomes allow rent-seeking by governments at the expense of public good provision?

Abdih et al. (2012) use a cross section of 111 countries to show that a higher ratio of remittances to GDP increases corruption, as measured by World Bank governance indicators. They estimate the effect of remittances by adding the remittance ratio in the set of regressors that La Porta et al. (1999) have used to explain corruption. Berdiev et al. (2013) extend the data by constructing a panel over the period 1986-2010, and estimating a dynamic panel where past corruption is included as regressor. Their results also show that remittances increase corruption, with the effect more pronounced in non-OECD countries.

Ahmed (2012) provide related evidence by showing that remittances (and foreign aid) reduce the likelihood of government turnover and regime collapse in autocracies. The idea is that remittances induce higher patronage, rather than public good provision, which is ostensive in autocratic regimes since they rely heavily on patronage for political survival. Tyburski (2014) also moderates the effect of remittances by regime type. Using panel data from 127 developing countries over the period 2000-2010, he estimates a hiearchical linear model and shows that remittances increase corruption in autocratic countries, while such effect is mitigated in democracies.

The mechanism underlying such results - formalized in both Ahmed and in Abdih et al., follows the logic of the Stackelberg duopoly game. Households use their remittance incomes to purchase public-good substitutes, which then allows the government, as first-mover in the game, to decrease its own provision of public goods. With less spent on public goods, more government revenues can then be transferred to political patrons.

Many empirical papers have indeed shown that households use remittance incomes to increase not only consumption but also investments in, e.g. education, health, entrepreneurial activities. (See, for instance, Adams and Page (2005), Aggarwal et al. (2006), Djajic (1986), Giuliano and Ruiz-Arranz (2005), Kapur and McHale (2005), McCormic and Wahba (2000), and Ratha (2013).) Using Hirschman's (1970) terminology of 'exit' and 'voice', Tyburski (2012) inteprets this as a kind of exit option from the government that individuals can take.[1]

At first glance, it seems plausible that the empirical fact that households purchase public-good substitutes on their own could make the government less accountable and enable it to spend less government revenues on public goods and more on patronage. However, none of the aforementioned papers empirically test this (Stackelberg) mechanism. Ahmed and Abdih et al.'s empirical findings do not even show that the goverment actually lowers public good provision. To my best knowledge, there exist no evidence that remittances increase patronage and decrease public good provision *because* the government is able to free-ride on households' provision of public-good substitutes.

It could very well be that any effect of remittances is obtained via other channels. For instance, Tyburski (2012) suggests that remittances can also increase 'voice' by providing resources and networks for recipients to organize politically, thereby increasing their ability to exert more pressure on the government. He notes how Transnational Migrant Associations (TMAs) and other political groups successfully changed policy and helped establish the *Paisano* program in Mexico which streamlines financial transfers across the border and prevents incursions by bureaucrats. In this case, remittances do not generate a curse since, by subsidizing the costs of political participation, they can even help increase government accountability. Thus, Tyburski (2012) actually finds

[1] A similar logic could be applied to emigration, in which case citizens physically leave the jurisdiction of the government. Sellars (2015), for instance, argues that emigration acts like an "exit valve", which allows the government to delay reforms. Thus, she shows in particular that land distribution in Mexico during the early 20th century rose only after emigrants came back to Mexico after the US stock market crash of 1929.

that corruption is lower in Mexican states with higher remittances.

To date, only Ahmed and Abdih et al. provide a formal model of how remittances might generate a curse in the form of low public good provision and high patronage. In this paper, I demonstrate that their Stackelberg mechanism becomes logically inconsistent when the government explicitly faces the threat of being replaced by a political challenger/s. The Stackelberg game is used to model a duopolistic market in which only one dominant firm exists, and is thus inappropriate in a political setting where the incumbent leader who controls the government can be replaced. The existence of even one challenger would prevent the incumbent from free-riding on households' provision of public-good substitutes, since the best that this challenger could do is to offer *not* to free-ride. To remain in power, the incumbent would then be induced to do the same. In equilibrium, households' provision of public-good substitutes and, thus, the remittance incomes that fund this endeavor, is irrelevant in the decision of the incumbent government to provide public goods. I also show that this result holds even when no challenger can credibly commit to maintaining her offer once she replaces the incumbent.

The next section starts by presenting the Stackelberg game of Ahmed and Abdih et al. Section 3 then incorporates into this model an explicit process by which the incumbent leader survives the threat of a political challenger. In particular, I use selectorate theory in which the challenger forms a coalition of political patrons from the 'selectorate' and offers policy, i.e. transfers that are targeted to patrons and public goods that are provided to the entire selectorate, with the view of inducing at least one member of the incumbent leader's coalition to defect to the challenger's.

I find that equilibrium policy is independent of remittances. The challenger's optimal policy offer is unaffected by the remittance incomes of the selectorate - the best that the challenger can do is to offer to spend all of government revenues on public goods (i.e. regardless of public-good substitutes) while transferring to her coalition an amount that would just satisfy its members. Since government revenues do not include remittances - the latter accruing directly to the selectorate, the challenger is unconstrained by remittance income and thus ignores it in her choice of policy. To prevent the defection of any of the members of the incumbent's coalition to the challenger's, the incumbent's best response is to provide the same level of public goods as the challenger would, and to transfer to her coalition an amount that is a discounted value of what the challenger would give to her own coalition. Thus, in equilibrium, an incumbent who remains in power offers policy that is independent of remittances.

I show that this result is robust to the size and composition of the coalition of political patrons and therefore holds when patronage is based on ethnicity or kinship, or even on whether or not the patron is a remittance-earner. I also consider elections as an alternative to coalition formation - using a probabilistic voting model to capture political competition between the incumbent and the challenger, I find that equilibrium policy is still independent of remittances.

After an intuitive discussion in Section 4, I provide an example in Section 5 of how remittances might have an effect on policy by formalizing Tyburski's (2012) notion that remittances can increase 'voice'. Section 6 concludes.

2 Implicit politics

To date, there are only two existing formal models - in Ahmed and in Abdih et al., that show the effect of remittances on public good provision by the government. Both of these predict that remittances induce a resource curse in the form of lower public good provision. In a Stackelberg game played by the government and households, the latter use their remittance incomes to purchase public-good substitutes, which enables the (first-mover) government to appropriate some portion of government revenues to herself and/or her patrons as rents, instead of spending it all on public goods. The extent of such rent-seeking is exogenous, and is simply determined by a parameter which captures the relative importance of rents and public-good provision in the political survival of the incumbent. The process by which the latter remains in power is unspecified.

To elucidate, consider a population of N households, with N normalized to one. The household h earns net income $(1-\tau)y+r$, where τ denotes the tax rate, y labor income, and r remittances, and derives the following (Cobb-Douglas) utility from consumption good c, public goods G that are provided by the government, and good g that is perfectly substitutable with G:

$$U_h = c^{\alpha}(G+g)^{1-\alpha}. \tag{1}$$

Net income is used to purchase c and public-good substitute g, which gives the following household budget constraint:

$$(1-\tau)y + r = c + g. \tag{2}$$

Meanwhile, the incumbent government I obtains tax revenues τy, of which some are distributed as transfers T, while the rest are used to provide public goods G. With G priced at one, the government budget constraint is thus

$$\tau y = G + T. \tag{3}$$

In Ahmed, T is given to political supporters as patronage, while in Abdih et al., it is kept by the incumbent for her own consumption, and thereby captures the amount lost to corruption. In either case, the incumbent is assumed to derive utility from a linear combination of the (log of) transfers and the household's utility:

$$U_I(T, U_h) = \lambda \ln(T) + (1-\lambda) \ln U_h, \tag{4}$$

where the parameter $\lambda \in (0,1)$ captures the extent to which the incumbent values patronage or her own rents, relative to the household's utility.

The following game Γ is played.

(i) The incumbent government I chooses policy vector (G, T), where G denotes public goods and T transfers. The household h receives only G, while T is either kept by I or distributed to her political supporters as patronage.
(ii) The household allocates its net income between consumption good c and public-good substitute g.

The game is solved by backward induction. To obtain interior solutions to the optimization problems of the household and the incumbent, assume that the parameters are such that $y > \max\left[(\frac{1}{1-\tau})(\frac{\alpha}{1-\alpha}G - r), \frac{\lambda r}{\tau-\lambda}\right], \tau \neq \lambda$.[2]

Given G, the household maximizes utility (1) subject to budget constraint (2). Thus, the optimal levels of the consumption good and public-good substitute are, respectively:

$$c^* = \alpha[(1-\tau)y + r + G] \tag{5}$$

$$g^* = (1-\alpha)[(1-\tau)y + r] - \alpha G, \tag{6}$$

which, when plugged into (1) obtains U_h^*. The incumbent government I then maximizes her utility (4), given U_h^*, subject to budget constraint (3). This yields equilibrium policy vector (G^*, T^*), where:

$$G^* = (\tau - \lambda)y - \lambda r. \tag{7}$$

$$T^* = \lambda(y + r) \tag{8}$$

[2] An interior solution to the household's problem is ensured by $y > (\frac{1}{1-\tau})(\frac{\alpha}{1-\alpha}G - r)$, while the analogous requirement for the incumbent's problem is $y > \frac{\lambda r}{\tau-\lambda}, \tau \neq \lambda$.

Thus, remittances decrease public-good provision and increase transfers. As in the Stackelberg duolopy game, the incumbent, being the first mover, free rides on the private provision of public-good substitutes by households, and is thereby able to decrease its own provision. This allows the incumbent to transfer some of the government revenues toward herself or her patrons.

The key assumption is that the incumbent is able to do so, that is, while surviving the implicit threat of political challengers who can replace the incumbent. Instead of specifying the process by which the incumbent survives the threat, Ahmed and Abdih et al. adopt equation (4) as the incumbent's utility function, with the weight $\lambda \in (0,1)$ capturing in reduced form, as it were, the underlying political competition that the incumbent faces from challengers.

However, when political competition is made explicit, it is difficult, if not altogether impossible, to justify the use of equation (4). Any political challenger can always offer not to take advantage of households' provision of public-good substitutes by offering policy that fully maximizes the household's utility U_h, that is, by acting as though $(1-\lambda)$ were equal to one. This would then induce the incumbent to try to do the same. I demonstrate in the next section that the logic holds even if the challenger subsequently reneges, that is, even if she cannot credibly commit to maintaining the policy once she is in power.

3 Political Competition

In order to explicitly incorporate political competition in the model, one has to specify how the leader is selected which, in turn, requires a mechanism for aggregating citizens' preferences for a leader. There are two such mechanisms - elections and coalition formation, the latter exemplified in Bruno de Mesquita et al.'s (1999, 2003, 2010) selectorate theory. I use coalition formation, as it is applicable to both autocracies and democracies.[3] In this framework, a subset of the population, called the selectorate, is responsible for choosing the leader. Specifically, in order to obtain and maintain power, the leader must have the support of a coalition of individuals who are drawn from the selectorate. The larger the size of this coalition, the higher the probability that any member of the selectorate is included in the coalition. (The regime becomes more democratic as the size of the coalition approaches one-half of the selectorate, since the leader would need the support of close to a majority of the selectorate.)

The leader chooses policy in exchange for such support. Smith (2008) and Gehlbach (2013) consider a specific application in which the relevant policy is the allocation of government revenues between private transfers and public goods. The following model closely resembles theirs, except for the additional role of selectors of providing public-good substitutes.

Consider again a population of size normalized to 1, of which a subset of size $S \leq 1$, called the selectorate, determines the political survival of any leader. In particular, any leader needs the support of a coalition of selectors of size $W \leq S$. The incumbent's coalition is composed of W selectors for whom the incumbent has the highest affinity among the selectorate. Any challenger who wishes to replace the incumbent leader must form a coalition, also of size W, which includes at least one member of the incumbent's coalition. Her aim is to offer an amount of transfers and level of public goods that would induce that member/s to defect from the incumbent's coalition. To prevent such defection, the incumbent then tries to match the offer of the challenger.

In an equilibrium in which the incumbent remains in power, the incumbent is able to adopt policy that less-than-fully matches this offer. This is because the challenger cannot credibly commit to maintaining the value of her offer, as she can always change policy once she becomes the incumbent. In addition, she can now form a new coalition of selectors for whom she has the highest affinity. (As a challenger, she needs to include in her initial coalition at least one member of the incumbent's, even if the challenger

[3] Nevertheless, I show in section 3.2 that the main result also holds in a model of probabilistic voting.

has no affinity for that selector.) Thus, members of a challenger's initial coalition can be subsequently dropped, in which case they lose the benefit of being in the coalition. In other words, the continuation value of the challenger's offer is less than the value in the current period, which makes the members of the incumbent's coalition loyal to her. The incumbent is thereby able to exploit this loyalty by adopting policy that less-than-fully matches the offer of the challenger while still remaining in power.

Members of the incumbent's coalition receive both the transfers and public goods from the incumbent, while other selectors get only the public goods. In addition, all selectors receive labor income, and some receive remittances as well. Each selector then decides how to allocate her total income between the consumption good and public-good substitute.

Consider, then, game Σ in which the following takes place at each time period $t = 0, 1, 2, ..\infty$.

a. At the start of period t, an incumbent leader I forms a coalition of selectors of size W who are highest in her affinity ordering of the selectorate. A challenger C, drawn randomly from the population, nominates a coalition of size W which includes at least one member of I's coalition. I and C each propose policy vector (G, T), where G denotes public goods and T is transferred to each member of their respective coalitions.

b. Each selector chooses between I and C. If any selector in I's coalition chooses C, I is deposed and C becomes the new leader.

c. The policy of the chosen leader is implemented. All selectors get public goods G, while only coalition members of the chosen leader get transfers T.

d. Each selector allocates her total income from labor income and/or remittances and/or transfers between private good c and public-good substitute g.

Steps (a) to (c) capture the canonical model of political competition via selectorate theory. To this I add (d), in which each selector decides how to spend her income, which is analogous to the allocation decision that households make in Ahmed and Abdih et al. after observing the policy choice of the leader, i.e. step (ii) in game Γ.

3.1 Equilibrium

I construct a stationary subgame-perfect Nash equilibrium (SPNE) in which incumbent I survives each period to show that, contrary to the result in Ahmed and Abdih et al., the equilibrium policy of the incumbent, i.e. one that allows her to remain in power, is independent of the remittance income of selectors.

I proceed by backward induction. Consider step (d). Given public goods G that are provided by the leader to all selectors, and transfers T that are provided to each member of the leader's coalition, each selector decides how much consumption good and public-good substitute to purchase. Let a selector i's utility be specified as the same Cobb-Douglas function as in equation (1), but selectors may differ in terms of the total income each receives. That is, the selector's utility is given by

$$U_i = c_i^{\alpha}(G + g_i)^{1-\alpha}, \tag{9}$$

while the budget constraint is

$$c_i + g_i = R_i, \tag{10}$$

where R_i is total income, which includes net labor income and possibly remittances, as well as a transfer from the leader if the selector is in the leader's coalition. Specifically, let $R_i \equiv y(1-\tau) + r_i + T_i$, where: y is labor income and τ the tax rate common to all i; $r_i = r_{s^r}\mathbb{1}_{\mathbb{r}}$ is remittance income, where $r_{s^r} > 0$ and $\mathbb{1}_{\mathbb{r}}$ is an indicator function that takes on 1 for remittance earners and 0 otherwise; and $T_i = T\mathbb{1}_{\mathbb{T}}$, where T is the transfer given by the leader and $\mathbb{1}_{\mathbb{T}}$ an indicator function that takes on 1 for members of the leader's coalition and 0 otherwise.

Maximizing (9) subject to (10) gives the optimal levels of the consumption good and the public-good substitute:

$$c_i^* = \alpha(R_i + G) \tag{11}$$

$$g_i^* = (1-\alpha)R_i - \alpha G. \tag{12}$$

Note that these are the same as in Ahmed and Abdih et al. (equations (5) and (6)) when $R_i = (1-\tau)y + r_{s^r}$. (For coalition members, c and g simply shift up to the extent of the additional transfer income T.) Plugging these into (9) gives

$$U_i^* = \phi(R_i + G) = \phi[y(1-\tau) + r_i + T_i + G], \tag{13}$$

where $\phi \equiv \alpha^\alpha (1-\alpha)^{1-\alpha}$.

Moving backward to the policy choice of leaders, the best offer that challenger C can make to her coalition entails spending total government revenues τy to maximize each member's utility, given by U_i^*.[4] With each coalition member receiving transfer T, let total government expenditures be given by

$$E = WT + \frac{1}{2}G^2, \tag{14}$$

where the cost of providing public goods is increasing in G. For an interior solution, assume that $\frac{W^2}{\tau y} < 2$. Maximizing (13) subject to the government budget contraint $\tau y = WT + \frac{1}{2}G^2$ gives the optimal level of public goods and transfer offered by the challenger:

$$G_C^* = W \tag{15}$$

[4]By the duality principle, this is equivalent to minimizing total government expenditures subject to the constraint that U_i is at least as large as U_i^*.

$$T_C^* = \frac{\tau y}{W} - \frac{W}{2}. \tag{16}$$

Note, then, that C's policy offer is independent of remittances. I show next that the incumbent's own policy choice is also unaffected by remittances.

In a stationary equilibrium where the incumbent I always survives competition from C, it must be that I matches the present value of C's policy offer. Let δ denote the (ordinary) discount rate. In the current period, selectors nominated by C to be part of her coalition receive T_C and G_C from C and thus enjoy utility $\phi[y(1-\tau)+r_i+T_C+G_C]$. From the next period onwards, however, when C is the new incumbent and thus forms a coalition based on affinity, the nominated selectors may or may not be included in this new affinity-based coalition. Assuming that all affinity orderings are equally likely, the probability that a selector nominated by C to her coalition remains in the coalition once C becomes the incumbent is $\frac{W}{S}$. Let V_I denote the present value of being inside the incumbent's coalition, and V_O the present value of being outside of it. The present value of the infinite stream of utilities that is derived from the challenger's policy offer by a selector nominated into C's coalition is thus

$$V_C = \phi[y(1-\tau) + r_i + T_C + G_C] + \delta[\frac{W}{S}V_I + (1-\frac{W}{S})V_O]. \tag{17}$$

Since C's nominated coalition includes at least one member of incumbent I's coalition, V_C must be matched by I in order to prevent defection to C. That is, since the present value of being in the incumbent's coalition is V_I, the incumbent must choose policy such that $V_I = V_C = \phi[y(1-\tau) + r_i + T_C + G_C] + \delta[\frac{W}{S}V_I + (1-\frac{W}{S})V_O]$ or, simplifying,

$$V_I(1-\delta\frac{W}{S}) = \phi[y(1-\tau) + r_i + T_C + G_C] + \delta(1-\frac{W}{S})V_O. \tag{18}$$

Selectors who do not remain in the coalition lose the stream of transfers, which implies that $V_O = \frac{\phi[y(1-\tau)+r_i+G_I]}{1-\delta}$, where G_I denotes the public goods provided by whoever is the incumbent leader. In equilibrium, the incumbent provides the same level of public goods as the challenger. In order to prevent defection of her coalition members, she must choose a level of public goods that at least satisfies U_i^*. That is, the incumbent minimizes expenditure E subject to the constraint that $U_i \geq U_i^*$, which is equivalent to the optimization problem of the challenger.[5] Thus:

$$G_I^* = G_C, \tag{19}$$

where $G_C = W$ from (15). Equation (18) can then be rewritten as

$$V_I = \phi\Big[\frac{T_C}{1-\delta(\frac{W}{S})} + \frac{y(1-\tau)+r_i+W}{1-\delta}\Big]. \tag{20}$$

Meanwhile, remaining inside the coalition has value $V_I = \frac{\phi[y(1-\tau)+r_i+W+T_I]}{1-\delta}$, where T_I denotes the transfer from the incumbent. Plugging this into (20) and solving for T_I gives the equilibrium level of transfers that the incumbent provides to her coalition members

$$T_I^* = T_C\Big(\frac{1-\delta}{1-\delta(\frac{W}{S})}\Big), \tag{21}$$

where T_C is given by (16). That is, the incumbent gives to each of her coalition members the challenger's transfer offer T_C, discounted by a factor $\Big(\frac{1-\delta}{1-\delta(\frac{W}{S})}\Big) \leq 1$, which increases with the probability of remaining in a leader's coalition, as determined by size W. (In the limit where all selectors are coalition members, transfers are received with probability one, which makes the offer T_C perfectly credible and induces the incumbent to exactly match it.)

In contrast, since all selectors, whether inside or outside the coalition, gets the same public goods, the challenger's offer of public goods is perfectly credible, and the

[5] Recall footnote 4.

incumbent perfectly matches it.

Note that remittances do not affect the transfers from the incumbent, nor the level of public goods. In fact, (19) and (21) are the exact same expressions derived in Gehlbach.[6]

The following result formally establishes that remittances generate neither a resource curse nor a blessing.

Proposition 3.1 *Consider game Σ. In equilibrium, the amount of public goods and of targeted transfers that the incumbent government provides are independent of the remittance income of the household. That is,* $\frac{\partial G_I^*}{\partial r_i} = \frac{\partial T_I^*}{\partial r_i} = 0$.

Proof The proof is immediate, as equations (15), (16), (19) and (21) imply that $G_I^* = W$ and $T_I^* = \left(\frac{\tau y}{W} - \frac{W}{2}\right)\left(\frac{1-\delta}{1-\delta(\frac{W}{S})}\right)$.

While the proof is specific to game Σ, the result in Proposition 3.1 can still hold even when certain details of the game are modified. In particular, I subsequently demonstrate the robustness of the result to (a) the size and composition of the leader's coalition/clientele to whom transfers are targeted, and to (b) using probabilistic voting as an alternative mechanism for aggregating the households' choice between the incumbent and the challenger.

3.2 Robustness

It can be easily shown that the number of households that earn remittance income and whether or not they are part of the winning coalition that receive transfers is irrelevant in the choice of equilibrium policy.[7] Suppose $S = S_R + S_{NR}$ where S_R is the number of households or selectorate members that earn, while S_{NR} are those that

[6] The expressions for G_C and T_C in Gehlbach are only slightly different: $G_C = (\frac{W}{p})^2$ and $T_C = \frac{N}{W} - \frac{W}{p}$, where p is the price of the public good and total revenues is set equal to population size N.

[7] One can, in fact, recall the flexibility with which the household's total income is represented by R_i in equation (10), whereby some households may or may not receive remittances and/or transfers.

do not earn, remittances, and suppose no member of S_R can be part of the winning coalition. In this case, $W = \phi(S - S_R)$, $\phi \in (0, 1]$, where $\phi = 1$ implies that all members of S_{NR} are part of the coalition. Even then, remittance incomes will not matter in the equilibrium allocation of government revenues between public goods and transfers, as the government cannot take remittances away from members of S_R in order to spend more on public goods and/or increase transfers to coalition members.

The household's utility and budget constraint are still given by (9) and (10), which means that it still chooses the same amount of consumption goods and public-good substitutes given by (11) and (12). Thus, the challenger's objective is still to maximize (13) given the government budget constraint. The latter is slightly different - total government expenditure is now $E = \phi(S - S_R)T + \frac{1}{2}G^2$, but note that it is still independent of remittance income r_i. Thus, maximizing (13) subject to $\tau y = \phi(S - S_R)T + \frac{1}{2}G^2$ gives $G_C^* = \phi(S - S_R)$ and $T_C^* = \frac{\tau y}{\phi(S - S_R)} - \frac{(\phi(S - S_R)}{2}$, which are independent of r_i. The incumbent will still want to match the challenger's offer, albeit the probability of remaining in the leader's coalition is now $\frac{\phi(S - S_R)}{S}$. Thus, $G_I^* = G_C^*$, while $T_I^* = T_C\left(\frac{1-\delta}{1-\delta(\frac{\phi(S - S_R)}{S})}\right)$.[8]

The number of remittance-earning households affects the amount of public goods provided to the selectorate, and the amount of transfer given to each coalition member, but their (remittance) incomes do not matter since the government can only spend government revenues, and not the remittances which go directly to remittance-earners.

The same logic applies even when leaders form coalitions based on ethnicity, or other types of affinity. This would only determine who and how many would obtain transfers and, thus, the probability of remaining in the leader's coalition. The income of remittance-earners who may or may not be co-ethnics would still not matter in the allocation decision of the challenger who can only spend taxable income. The

[8] Remittance incomes still would not matter even if *only* remittance earners can be part of the coalition. In this case, $E = \psi(S - S_{NR})T + \frac{1}{2}G^2$, $\psi \in (0, 1]$, which implies $G_C^* = \psi(S - S_{NR})$, $T_C^* = \frac{\tau y}{\psi(S - S_{NR})} - \frac{\psi(S - S_{NR})}{2}$, and $G_I^* = G_C^*$. The probability of remaining in the leader's coalition is now $\frac{\psi(S - S_{NR})}{S}$, which implies $T_I^* = T_C\left(\frac{1-\delta}{1-\delta(\frac{\psi(S - S_{NR})}{S})}\right)$.

incumbent would still want to match the challenger's offer, although the probability of remaining in the coalition and, therefore, T_I^* would now depend on the relative size/number of co-ethnics.

The result in Proposition 3.1 may also be robust to the particular mechanism for aggregating households' preference between C and I. For instance, I show that the equilibrium amounts of public goods and transfers are independent of remittances even when leader selection is done through probabilistic voting in elections.

Note that from the challenger's point of view, prior to her choice of policy, each voter/selector's utility is U_i^* (equation 13), in which the optimal allocation (c^*, g^*) of household income is taken as given. Let $U_i^*(G_C, T_C)$ denote the value that utility U_i^* would take if the challenger were to win the election and, therefore, policy (G_C, T_C) were adopted, and $U_i^*(G_I, T_I)$ the analogous utility that selector i would obtain if the challenger were to lose to the incumbent and (G_I, T_I) were implemented instead. To allow for any inherent affinity a voter might have for the incumbent or for the challenger, I adopt a standard probabilistic voting model in which a random variable, denoted as u_i, captures the relative preference of voter i for the incumbent over the challenger.

Selector i votes for the challenger if and only if $U_i^*(G_C, T_C) \geq U_i^*(G_I, T_I) + u_i$, or $u_i \leq U_i^*(G_C, T_C) - U_i^*(G_I, T_I)$. Let u_i be independently and uniformly distributed over the interval $[-\frac{1}{2\mu}, \frac{1}{2\mu}]$. Then the share of the voting population that vote for the challenger is $s_C = \mu[U_i^*(G_C, T_C) - U_i^*(G_I, T_I) - (-\frac{1}{2\mu})]$ or, $s_C = \frac{1}{2} + \mu[U_i^*(G_C, T_C) - U_i^*(G_I, T_I)]$.

The challenger thus offers policy vector (G_C, T_C) that maximizes its vote share s_C, subject to its budget constraint $\tau y = tT_C + \frac{1}{2}G_C^2$, where t is the subgroup of the voting population that receives transfers. Recall that in the original game Σ, this subgroup is the winning coalition W. Here I make no such restriction, in order to show that the composition of t remains irrelevant - the amount of public goods and transfers are still independent of remittances.

Plugging T_C into T_i and G_C into G in equation (13) to get an expression for $U_i^*(G_C, T_C)$, and re-writing the budget constraint to get an expression for T_C, i.e. $T_C = \frac{\tau y}{t} - \frac{1}{2t}G_C^2$, solving the challenger's maximization problem is equivalent to solving the following unconstrained problem:

$$\max_{G_C} \mu\phi[\frac{\tau y}{t} - \frac{1}{2t}G_C^2 + G_C]. \tag{22}$$

Thus, the challenger offers the following amount of public goods

$$G_C^* = t, \tag{23}$$

which, when plugged into constraint $T_C = \frac{\tau y}{t} - \frac{1}{2t}G_C^2$, gives the amount of transfer offered to each member of t:

$$T_C^* = \frac{\tau y}{t} - \frac{t}{2}. \tag{24}$$

Note, then, that equations (23) and (24) are identical to equations (15) and (16) when $t = W$ and, as before, are independent of remittance income r_i however which way group t is constituted.

The incumbent leader has similar incentives. If elections were perfectly competitive, the incumbent would want to maximize its share of votes $s_I = 1 - s_C$ subject to its budget constraint $T_I = \frac{\tau y}{t} - \frac{1}{2t}G_I^2$ in order to remain in office. In this case, the incumbent would perfectly match the challenger's offer: $G_I^* = t$, $T_I^* = \frac{\tau y}{t} - \frac{t}{2}$. It is likely, however, that the challenger can only compete imperfectly, in which case the incumbent enjoys an advantage and is therefore able to adopt policy that imperfectly matches the challenger's offer.[9] In either case, one can represent the incumbent's policy

[9]Electoral competition may be imperfect because no challenger can credibly commit to implementing her offer and thus cannot contract her future performance with voters, and/or voters have imperfect information as to the leadership type or quality of the challenger and cannot prevent the 'bad' type from being elected. Such contractual incompleteness and asymmetric information ease the competitive pressures on the incumbent leader. For a formal exposition, see, for instance, Persson and Tabellini (2000).

as a function of the challenger's offer: $G_I^* = f(G_C^*)$, $T_I^* = g(T_C^*)$. Thus, to the extent that G_C^* and T_C^* are independent of remittances, so are G_I^* and T_I^*.[10]

4 Why Remittances Have No Effect

In the foregoing model, the optimization problem of selectors is essentially identical to that of the households in Ahmed and Abdih et al. Given policy, i.e. the transfers and public goods provided by the leader, households allocate their income between consumption goods and private-good substitutes in the same manner. The difference is in what occurs prior to such decision.

In Ahmed and Abdih et al., the incumbent is assumed to choose policy that maximizes a linear combination of households' utility, and her own (Abdih et al.) or her patrons' (Ahmed) utility, where some exogenous weight $\lambda \in (0, 1)$ is assigned to the latter. When λ is close to one, the leader is able to allocate more government revenues toward transfers that are targeted to patrons, and less toward public goods that benefit all households. As first mover in the game, the leader anticipates that households can themselves provide public-good substitutes, which enables the leader to decrease her own provision of public goods and thereby spend more on transfers. The greater the remittance incomes of households, the more public-good substitutes can be privately purchased, and the less public goods the leader has to provide. Thus, as seen in (7) and (8), public goods are decreasing, while transfers are increasing, in remittances. Conversely, when λ is close to zero, the leader is less able to take advantage of households' provision of public-good substitutes, which implies that more public goods are provided by the leader, and less is spent on transfers.

What exactly is λ? The implicit assumption is that the incumbent would not remain in power unless she maximizes the combination of utilities given by equation (4), which

[10] The Appendix considers other models of electoral competition and other possible modifications to game Σ, by putting forth some conjectures for a set of games in which Σ belongs.

depends on λ. Ahmed thus calls this maximand the leader's survival function. However, neither Ahmed nor Abdih et al. specify the process by which the incumbent actually survives political competition. One is left to speculate how, if at all, such survival function is obtained in equilibrium.

I have thus shown that in a game in which political competition explicitly occurs prior to the allocation decision of households, the supposed survival function (equation (4)) of the incumbent leader is insupportable. This is because any political challenger can always offer the best policy for households by fully maximizing their utility - that is, by behaving as though the weight $(1-\lambda)$ attached to the household's utility were equal to one. Thus, in order to survive the competition from challenger/s, the incumbent will try to behave in the same manner and match the offer of the challenger.

Imperfect competition would not necessarily induce the incumbent to choose policy that maximizes the survival function (equation (4)), as the incumbent would still base its decision on the challenger's choice. Using selectorate theory, for instance, one can demonstrate that the incumbent perfectly matches the challenger's offer of public goods, while it 'discounts' the challenger's offer of targeted transfers to coalition members. More generally, one can depict the incumbent's equilibrium policy as a mapping from the challenger's optimal policy offer to the range of policies that the incumbent can take, since it is the best response to the challenger's best response to the household's optimal allocation decision.

Thus, for the equilibrium policy to be independent of remittances, it is necessary that the challenger's optimal policy be independent of remittances. In turn, the latter requires that the challenger is not constrained by remittances, so that it can choose policy that maximizes the household's utility that ignores the latter's remittance income. This requirement is plausible since, unlike other windfall incomes like those from oil, natural resources, and foreign aid, remittances accrue directly to households and are not part of government revenues. In fact, both Ahmed and Abdih et al. make this assumption, which is why the government budget constraint (equation (3)) is independent of remittance incomes.

It follows, then, that the equilibrium policy of the incumbent would no longer be independent of remittances if the challenger could have direct access to remittance incomes. The next section provides an example.

5 How Remittances Could Matter: An Example

Suppose that in forming a coalition, the challenger can use the remittance incomes of her coalition members in the following manner. She redistributes total remittance incomes equally, such that each member, whether or not she is a remittance-earner, gets remittance $r = \frac{1}{W}\sum_{i=1}^{W} r_i$ (where recall that $r_i = r_{s^r}\mathbb{1}_{\mathbb{r}}$, with $\mathbb{1}_{\mathbb{r}}$ an indicator function that takes on 1 for a remittance earner and $r_{s^r} > 0$ the latter's remittance income). In effect, there is a cost incurred whenever non-remittance and remittance earners organize opposition to the incumbent, which remittance earners pay for.[11] This captures in a simple, but formal, way Tyburski's (2012) idea that remittances can increase 'voice' by subsidizing the costs of political participation. So as not to restrict the type of coalitions that can be formed, I simply assume that the parameters are such that the transfer T_C provided to each member of the challenger's coalition is always at least as large as r_{s^r}. The challenger is thus able to nominate any selector to her coalition, since a remittance earner who subsidizes other members recovers the subsidy by getting T_C.

In the initial period, each member of the challenger's coalition obtains utility $\phi[y(1-\tau) + r + T_C + G_C]$, but in the future, the member that is dropped from the coalition gets value V_O, while the member that remains in the coalition obtains V_I. With membership in the incumbent's coalition still assumed to be determined by affinity,

[11] Note that $r = 0$ when the coalition is composed only of non-remittance earners, while $r = r_{s^r}$ when the coalition is made up entirely of remittance earners. In either case, no redistribution takes place, and organizing opposition is therefore costless.

and with all affinity orderings equally likely, the probability of being/remaining in the incumbent's coalition is still $\frac{W}{S}$. Thus, the present value of the challenger's offer is $V_C = \phi[y(1-\tau) + r + T_C + G_C] + \delta[\frac{W}{S}V_I + (1-\frac{W}{S})V_O]$, which the incumbent has to match. That is:

$$V_I = \phi[y(1-\tau) + r + T_C + G_C] + \delta[\frac{W}{S}V_I + (1-\frac{W}{S})V_O]. \tag{25}$$

To get the expression for V_O, note that selectors who are subsequently dropped from the coalition not only lose the transfer, but also the subsidy by the remittance earners in the coalition. That is, they revert to their original income level. This means that the value of being outside the coalition is, as before, $V_O = \frac{\phi[y(1-\tau)+r_i+W]}{1-\delta}$. Plugging this into (25) and simplifying thus obtain

$$V_I = \phi\Big[\frac{y(1-\tau)+W}{1-\delta} + \frac{T_C + r}{1-\delta(\frac{W}{S})} + \frac{\delta(1-\frac{W}{S})r_i}{(1-\delta)(1-\delta(\frac{W}{S}))}\Big]. \tag{26}$$

Now since remittances only subsidize political opposition, the incumbent does not need to use/redistribute the remittance incomes of her own coalition. (Being bound by affinity obviates the need to incur additional costs, i.e. apart from the transfers, to maintain the coalition.) Thus, as before, the value of being inside the incumbent's coalition is $V_I = \frac{\phi[y(1-\tau)+r_i+W+T_I]}{1-\delta}$ which, when plugged into (26), gives the following expression for T_I:

$$T_I = (T_C + r - r_i)\Big(\frac{1-\delta}{1-\delta(\frac{W}{S})}\Big). \tag{27}$$

Members of the incumbent's coalition can thus get different levels of transfers. Remittance earners in the coalition each receive $T_I = (T_C + r - r_{s^r})\Big(\frac{1-\delta}{1-\delta(\frac{W}{S})}\Big)$ from the incumbent, while non-remittance earners get $T_I = (T_C + r)\Big(\frac{1-\delta}{1-\delta(\frac{W}{S})}\Big)$. Note that since $r \in [0, r_{s^r}]$, remittance earners receive a transfer that is no greater than, while non-remittance earners no less than, what they receive in the original model. Thus, when coalition formation by the challenger requires remittance earners to subsidize non-remittance earners, the former are naturally no better off, while the latter no worse off, in equilibrium, than when no such subsidy is required.

The incumbent can give remittance earners a lower level of transfer than non-remittance earners in her coalition because if the former defect to the challenger, they would lose some of their remittance income. In contrast, non-remittance earners would actually gain some remittance income in the challenger's coalition. This makes remittance earners more loyal to the incumbent while non-remittance earners are less loyal. This then allows the incumbent to transfer a smaller amount to the remittance earners, but requires her to transfer a larger amount to non-remittance earners.

Remittances could thus matter in that it could make the incumbent's political support from remittance earners cheaper, while that from non-remittance earners more expensive. When there a large number of remittance earners for whom the incumbent has affinity such that many members of the incumbent's coalition are remittance earners, total patronage can be lower when remittance earners subsidize political participation. Conversely, when there are too few remittance earners in the incumbent's coalition, total patronage can be larger. Specifically, let γ be the percentage of remittance earners in the incumbent's W-highest affinity ordering of the selectorate. Then total patronage is $\gamma W[(T_C + r - r_{s^r})\left(\frac{1-\delta}{1-\delta(\frac{W}{S})}\right)] + (1-\gamma)W[(T_C + r)\left(\frac{1-\delta}{1-\delta(\frac{W}{S})}\right)]$, while total patronage in the original model of section 3 is $W[(T_C)\left(\frac{1-\delta}{1-\delta(\frac{W}{S})}\right)]$. Note that the former is greater than the latter whenever $\gamma < \frac{r}{r_{s^r}}$ which, in turn, is more likely when W is small (and r is thus large).

Thus, total patronage increases when remittance earners subsidize political participation, but this is only likely to occur for autocratic regimes where W is small. This appears consistent with the empirical findings of Tyburski (2014) that remittances increase corruption in autocratic countries. Note, however, that public good provision remains the same. This is because all citizens, whether inside or outside the leader's coalition, get the same amount of public goods. The government cannot restrict access to coalition members, which prevents the incumbent from using public good provision as a tool to gain political support. Thus, neither coalition formation, nor the remittances that affect it, is relevant in determining the level of public goods that the government provides.

6 Conclusions

The nascent debate on whether remittances generate a resource curse is one that cannot be settled solely by empirical studies. More importantly, it needs to be formalized in order to clarify the precise conditions under which the curse may or may not exist. Thus far, the models of Ahmed and Abdih et al. predict that remittances enable the government to decrease public good provision and increase rent-seeking, but this is essentially because these models use a Stackelberg duopoly game to describe the interaction of the incumbent leader and her constituents. That is, when the latter can themselves use their remittance income to provide public-good substitutes, the incumbent as first mover can take advantage of this and decrease her own provision, thereby enabling her to appropriate government revenues as rents.

The Stackelberg game, however, is unsuitable since, unlike a market in which only one leader firm may exist, an incumbent leader is simply one of many potential leaders. The fact that she is the incumbent presupposes that she continues to survive threats from political challengers. By explicitly modeling political competition, I have shown that the results in Ahmed and Abdih et al. are insupportable. To replace the incumbent, a challenger's best response would be to offer policy that fully maximizes the household's utility, taking as given the optimal level of public-good substitutes that the household provides on its own. Since the amount of remittance income is already taken into account in the decision of the household, it becomes irrelevant in the policy choice of the challenger. Thus, the challenger's best (optimal) policy offer would be one that does not take advantage of households' ability to provide public-good substitutes.

In the face of such competition, the incumbent is thus induced to try to match the offer. Even if competition is imperfect, the incumbent's best response is still a mapping from the challenger's optimal policy offer to the range of policies that the incumbent can take. To the extent that the challenger's optimal choice is independent of remittances, the equilibrium policy of the incumbent is thus unaffected by remittances.

Thus, the threat from political challengers casts theoretical doubt on the existence of a resource curse from remittances. Unlike revenues from oil, natural resources, and foreign aid to which the government has ready access, remittance incomes go directly to citizens. I have shown that the best that any challenger can do is *not* to free-ride on citizens' use of their incomes, which induces the incumbent government to behave similarly. That is, the Stackelberg logic in Ahmed and Abdih et al. falls apart when political competition is modeled explicitly.

References

[1] Adams R. H., and Page, J. 2005. "Do International Migration and Remittances Reduce Poverty in Developing Countries?" *World Development* 33 (10): 16451669.

[2] Abdih, Y., Chami, R., Dagher, J., Montiel, P. 2012. "Remittances and institutions: are remittances a curse?" *World Development* 40: 657666.

[3] Ahmed, Faisal Z. 2012. "The Perils of Unearned Foreign Income: Aid, Remittances, and Government Survival." *American Political Science Review* 106 (01):146-65.

[4] Aggarwal, R., DemirgucKunt, A., and Peria, M. S. M. 2006. "Do Workers Remittances Promote Financial Development?" *Journal of Development Economics* 6: 255-264.

[5] Berdiev, Aziz N., Kim, Yoonbai, and Chang, Chun-Ping. 2013. "Remittances and Corruption." *Economics Letters* 118: 182-185.

[6] Bueno de Mesquita, Bruce, Morrow, James D., Siverson, Randolph M., and Smith, Alastair. 1999. "An Institutional Explanation of the Democratic Peace." *American Political Science Review* 93 (4): 791-807.

[7] Bueno de Mesquita, Bruce, Smith, Alastair, Siverson, Randolph M., and Morrow, James D. 2003. *The Logic of Political Survival.* Cambridge, MA: MIT Press.

[8] DJajic, S. 1986. "International Migration, Remittances and Welfare in a Dependent Economy." *Journal of Development Economics* 21: 229-234.

[9] Gehlbach, Scott. 2013. *Formal Models of Domestic Politics.* Cambridge University Press.

[10] Giuliano, P. and Ruiz-Arranz, M. 2005. "Remittances, Financial Development, and Growth." IMF Working Paper, WP/05/234, Research Department, December, 2005.

[11] Hirschman, Albert Otto. 1970. *Exit, Voice, Loyalty Responses to Decline in Firms, Organizations, and States.* Cambridge, MA: Harvard University Press.

[12] Kapur, D., and McHale, J. 2005. "Give Us Your Best and Brightest: The Global Hunt for Talent and Its Impact on the Developing World." Center for Global Development, Ideas to Action, Independent Research for Global Prosperity.'

[13] La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and Vishny, R. W. 1999. "The quality of government." *The Journal of Law, Economics and Organization* 15: 222-279.

[14] McCormic, B., and Wahba, J. 2000. "Overseas Employment and Remittances to a Dual Economy." *The Economic Journal* 110(463): 509-534.

[15] Persson, Torsten and Tabellini, Guido. 2000. *Political Economics: Explaining Economic Policy.* Cambridge, MA: MIT Press.

[16] Ratha, D. 2013. "The Impacts of Remittances on Economic Growth and Poverty Reduction." Migration Policy Institute, Policy Brief, No. 8, September 2013, Migration and Development, the World Bank.

[17] Sellars, Emily A. 2015. "Does Emigration Inhibit Political Reform? Evidence from the Mexican Agrarian Movement, 1916-1945." PhD dissertation. University of Wisconsin-Madison.

[18] Tyburski, Michael. 2012. "The Resource Curse Reversed? Remittances and Corruption in Mexico." *International Studies Quarterly* 56 (2): 339-350.

[19] Tyburski, Michael. 2014. "Curse or Cure? Migrant Remittances and Corruption." *The Journal of Politics* 76(3): 814-824.

A Appendix

I show that the result in Proposition 3.1 is likely to hold for a larger class of games.

Recall game Γ in Ahmed and Abdih et al. in which political competition is only implicit. Now consider any game, one-shot or repeated, in which such competition is made explicit by letting the following step/s occur before step (ii) in game Γ, that is, *prior* to the household's allocation decision between consumption goods c and public-good substitutes g: the incumbent leader I offers public goods and (targeted) transfers (G_I, T_I), while a challenger C offers (G_C, T_C); after observing the offers, each household i chooses between C and I, and the individual preferences are aggregated to determine whether C or I holds office; whoever is in office implements her offer.

As in game Γ, the household's utility is given by (1), in which G and g are perfect substitutes. Its budget constraint is given by (10), of which constraint (2) in game Γ is a special case. Finally, as in game Γ, remittance income r_i is untaxed such that no portion of remittances is included in government revenues.

Let any such game ω belong to set Ω. (Game Σ is an example, in which the mechanism that aggregates households' preferences between C and I is coalition formation).

Until proven otherwise, the following conjectures hold for any game $\omega \in \Omega$.

Conjecture A.1 *The best policy that any challenger to the incumbent leader can offer is* (G_C^*, T_C^*) *such that* $\frac{\partial G_C^*}{\partial r_i} = \frac{\partial T_C^*}{\partial r_i} = 0$.

In lieu of a formal proof, I provide the following intuition. Since the challenger makes the offer prior to the household's allocation (c^*, g^*), the challenger takes the latter as given. Since (c^*, g^*) is already the household's optimal choice given its budget, which may include remittance income r_i, the challenger, by taking (c^*, g^*) as given, in effect ignores r_i. The best that the challenger can do is to further maximize the household's utility (given(c^*, g^*)) subject to the government budget constraint. Since government revenues do not include any portion of remittances, it is *likely* that the government budget is unaffected by r_i which, *if true*, implies that the challenger's optimal allocation (G_C^*, T_C^*) thereof is also unaffected by r_i.

Conjecture A.2 *Political competition induces the incumbent leader to try to match the best offer that any challenger can make. That is,* $G_I^* = f(G_C^*)$ *and* $T_I^* = g(T_C^*)$, *with* $f(0) = 0, f'(\cdot) > 0, g(0) = 0, g'(\cdot) > 0$.

That an incumbent who wants to remain in power would try to match the offer of the challenger could be taken as an axiom. What makes the above result a conjecture, however, is the claim that the offer that the incumbent would want to match is the best offer that *any* challenger can make, and that this best offer is one that maximizes utility $U_i(c^*, g^*)$ subject to a budget constraint that is independent of remittances, i.e. (G_C^*, T_C^*). Notice, then, that f maps G_C^*, and not any other value G_C, to G_I^*. Similarly, g maps T_C^*, and not any other T_C, to T_I^*. For (G_I^*, T_I^*) to be part of the equilibrium of game $\omega \in \Omega$, it must be the best response to the Challenger's best response to (c^*, g^*). That such best response is given by (G_C^*, T_C^*) only relies, however, on Conjecture 3.2.

Note that Conjecture A.2 allows cases in which competitive pressures may be so weak such as to afford the incumbent a considerable advantage over the challenger, since the derivatives $f'(G_C^*)$ and $g'(T_C^*)$ may be close to zero.

If Conjectures A.1 and A.2 hold, then the result in Proposition 3.1 is true for any game $\omega \in \Omega$:

Conjecture A.3 *In equilibrium, the amount of public goods and of targeted transfers that the incumbent government provides are independent of the household's remittance income. That is,* $\frac{\partial G_I^*}{\partial r_i} = \frac{\partial T_I^*}{\partial r_i} = 0$.

Proof Conjecture A.2 implies that $\frac{\partial G_I^*}{\partial r_i} = f'(G_C^*) \cdot \frac{\partial G_C^*}{\partial r_i}$ and $\frac{\partial T_I^*}{\partial r_i} = g'(T_C^*) \cdot \frac{\partial T_C^*}{\partial r_i}$. By Conjecture A.1, $\frac{\partial G_I^*}{\partial r_i} = f'(G_C^*) \cdot 0 = 0$ and $\frac{\partial T_I^*}{\partial r_i} = g'(T_C^*) \cdot 0 = 0$.