Tobacco Contract Farming, Crop Diversification and Household Relations in the Central Region of Malawi

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Abstract

This article examines crop diversification and household relations within a contract farming scheme in the Central Region of Malawi. It discusses a pilot study which formally included wives to grow soya as part of a tobacco contract in Kasungu District. The paper assesses whether this intervention improved benefits for the firm (through higher repayment rates), the farm (through higher yields for key crops) and the family (through greater well-being). Club-level data suggest repayment rates remained the same. Comparisons between participating and non-participating households show a lack of accord between spouses: husbands asserted that maize yields and household well-being declined; wives highlight how they withdrew labour from soya, not maize, as they lost some control over this crop. Both spouses agreed soya production and yields declined sharply but also that the firm should continue contracting wives to grow soya through a *separate* contract. Using data from both spouses offers a window on non-cooperation within households with practical relevance for firms wishing to diversify the crops they are supporting via contract farming initiatives.

Contract farming, gender, sub-Saharan Africa, Malawi, food crops, intra-household models.

Introduction

Recent years have seen the reform of tobacco production and marketing in Malawi and a shift from the classic auction floor system to a contract farming system where tobacco leaf merchants/manufacturers directly provide inputs and obtain exclusive purchase rights over the resultant crop. In the early 2000s, leaf merchants started contract farming on large-scale estates, especially for flue-cured tobacco. Due to problems with smuggling and foreign exchange hoarding, from 2003/04 all contracted tobacco was required to pass over the auction floors in a 'silent' auction where the Tobacco Control Commission graded the quality of the leaf. Around this time, leaf merchants, especially Dimon before it's merger with Stancom, started contracting smallholders, particularly around Kasungu District. By the end of the decade, around half the national burley tobacco crop (the main variety of tobacco grown in Malawi) was grown through contract farming.[1] In recent years this has increased to over 70% of the burley tobacco crop.

The shift to contract farming over the past two decades has seen the bundling of numerous goods and services that were once provided by a diverse range of firms and state-linked bodies into the contracts offered by tobacco leaf merchants/manufacturers in Malawi. This entry of tobacco firms into backward and forward nodes of the tobacco value chain (encompassing the provision of seed, fertilizer, on the one hand, and hessian sacks and transport on the other) has limited the ability of actors previously engaged in these activities to benefit from the country's main industry, leading some in government to brand contract farming as a form of neo-colonialism. Whilst that charge appears too strong, a plausible assertion is that the limited rents

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[1] See M. Prowse and J. Moyer-Lee, 'A comparative value chain analysis of smallholder burley tobacco production in Malawi–2003/4 and 2009/10', Journal of Agrarian Change, 14, 3 (2014), pp. 323-346; J. Moyer-Lee, J. and M. Prowse, 'How traceability is restructuring Malawi's tobacco industry', *Development Policy Review*, 33, 2 (2015), pp. 159-174; M. Prowse and P. Grassin, *Tobacco, transformation and development dilemmas from Central Africa* (Switzerland, Palgrave Macmillan, 2020).

now available to be extracted from the tobacco value chain by others apart from the leaf merchants, has led the political elite in Malawi to focus on a different source of revenue. Chinsinga has argued that aid has become the *de facto* new productive sector in Malawi, with all this entails for sovereignty and growth in the country.[2] At the same time, demand for Malawian tobacco has been decreasing recently with export earnings in dollar terms falling back towards levels seen in 2008. Malawi's extreme dependence on tobacco and the limited range of commodities and sectors the political elite can extract rents from has precipitated a new and much-needed push for crop diversification in the country.[3]

This article aims to contribute to recent contributions on crop diversification in Malawi.[4] It does so by assessing diversification within a contract farming scheme in the Central Region at the same time as investigating household relations. It evaluates the extent to which formally including wives within tobacco contracts to receive and grow soya led to benefits for the firm, farm and the smallholder family. Specifically, the article reports results from a pilot study which investigated three research questions, namely whether the formal inclusion of wives: (i) led to

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[2] B. Chinsinga, 'The Political Economy of Agricultural Commercialisation in Malawi' *Agricultural Policy Research in Africa (APRA) Working Paper 17* (Brighton, Institute of Development Studies, University of Sussex, 2018).

[3] R. Lencucha, T. Moyo, R. Labonte, J. Drope, A. Appau, and D. Makoka, 'Shifting from tobacco growing to alternatives in Malawi? A qualitative analysis of policy and perspectives', *Health Policy and Planning*, 35, 7 (2020), pp. 810-818; M, Kachulu, L. Rasche, U. Schnieder and V. Chinene, 'Tobacco substitutability and its effect on producer revenue and foreign exchange earnings under smallholder agriculture in Malawi', *African Journal of Agricultural and Resource Economics* 13, 4 (2018), pp. 331-344; B. Chinsinga and M. Matitta, ' The Political Economy of the Groundnut Value Chain In Malawi: Its Re-Emergence Amidst Policy Chaos, Strategic Neglect and Opportunism' *Agricultural Policy Research in Africa (APRA) Working Paper 56* (Brighton, Institute of Development Studies, University of Sussex, 2021); A. Wineman, L.Chilora and T.. Jayne 'Trends in Tobacco Production and Prices in Malawi' *Nicotine & Tobacco Research* October 4th (2021) https://doi.org/10.1093/ntr/ntab197

[4] T. Benson *'Disentangling food security from subsistence agriculture in Malawi'* (Washington, DC, International Food Policy Research Institute (IFPRI), 2021); G. Maggio and N. Sitko, 'Diversification is in the Detail: Accounting for Crop System Heterogeneity to Inform Diversification Policies in Malawi and Zambia' *The Journal of Development Studies*, 57, 2 (2021), pp. 264-288. J. Smith and J, Fang 'If you kill tobacco, you kill Malawi': Structural barriers to tobacco diversification for sustainable development' *Sustainable Development*, 28, 6 (2020) pp. 1575– 1583.

an increase in repayment rates; (ii) improved labour collaboration within the household such that yields for key crops increased; (iii) improved household well-being.

The article also makes a contribution to the literature on contract farming. Whilst there is a recent literature using quasi-experimental analysis to assess if smallholders *benefit* from contract farming arrangements,[5] studies using experimental designs to assess *innovations* within contracts are still limited.[6] None, as far as the author is aware, focus on gender, or on the impact of formally including wives within contracting schemes. Before outlining the structure of the article, the remainder of the introduction outlines the background of the company which this research was conducted with and the specific contract farming scheme in question.

During the early 2000s, there were four main tobacco merchants in Malawi which traded burley tobacco. Limbe Leaf was the dominant tobacco leaf merchant in Malawi and was owned by the American multinational Universal Leaf (58%), the largest global leaf merchant at that time, and Press Corporation (42%), the largest limited company in Malawi (see Van Donge for a

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[5] S. Bolwig, P. Gibbon and S. Jones, 'The Economics of Smallholder Organic Contract Farming in Tropical Africa', *World Development*, 37, 6 (2009), pp. 1094-1104; S. Miyata, N. Minot and D. Hu, 'Impact of Contract Farming on Income: Linking Small Farmers, Packers, and Supermarkets in China', World Development, 37, 11 (2009), pp. 1781-1790; S. Setboonsarng, P. Leung and A. Stefan, 'Rice Contract Farming in Lao PDR: Moving from Subsistence to Commercial Agriculture', *ADBI Discussion Paper No. 90* (Tokyo, Asian Development Bank Institute, 2008); M. Bellamare, 'As You Sow, So Shall You Reap: The Welfare Impacts of Contract Farming', *World Development*, 40, 7, (2012), pp. 1418-1434; M. Bellemare and J. Bloem. 'Does contract farming improve welfare? A review' *World Development*, 112 (2018), pp. 259-271. G. Ton, W. Vellema, S. Desiere, S. Weituschat and M. D'Haese, 'Contract farming for improving smallholder incomes: What can we learn from effectiveness studies', *World Development*, 104 (2018), p. 46-64.

[6] C. Saenger, C., M. Torero and M. Qaim, 'Impact of Third-party Contract Enforcement in Agricultural Markets—A Field Experiment in Vietnam', *American Journal of Agricultural Economics* 96, 4 (2014), pp. 1220-1238; C. M. Torero, M. And A. Viceisza, A. 'Potential collusion and trust: Evidence from a field experiment in Vietnam' *African Journal of Agricultural and Resource Economics*, 11, 1 (2016), pp. 22-32. I. Mugwagwa, J. Bijman, and J. Trienekens, 'Why do agribusiness firms simultaneously source from different contract farming arrangements? Evidence from the soybean industry in Malawi', *International Food and Agribusiness Management Review*, 22(2019), pp. 79-96. S. Kunte, M. Wollni and C. Keser, C., 'Making it personal: breach and private ordering in a contract farming experiment', *European Review of Agricultural Economics*, 44, 1 (2018), pp. 121-148. S. Rosch and D. Ortega, 'Willingness to contract versus opportunity to contract: a case study in Kenya's French bean export market' *Agricultural Economics*, 50, 1, (2019), pp. 27-37.

description of the important role Press has played in the Malawian economy).[7] At this time, Stancom and Dimon were the two further main buyers on the floors and were wholly-owned subsidiaries of US multinational leaf companies (the second and third largest global leaf merchants, respectively). The last buyer was Africa Leaf, which was purchased by Japan International Tobacco in 1999.[8]

By 2010, the landscape of tobacco merchants in Malawi had changed considerably (see Prowse, 2011, for a detailed summary of the changes in the tobacco value chain during this time). As we saw above, contract farming grew rapidly during this decade. Moreover, the second and third largest leaf merchants globally, Stancom and Dimon, merged and the new company, Alliance One, challenged the dominance of Limbe Leaf in the country. At this time, the late President Bingu wa Mutharika took a confrontation stance towards the limited competition in the tobacco sector (as the four main players had been operating a buying cartel on the auction floors through the early 2000s, as evidenced by Prowse (2011) using a series of logistic regressions on auction floor data).[9] Around 2010, three further firms entered the tobacco market. Government, through Auction Holdings, created Malawi Leaf which started buying bales of tobacco on the floors but had to rent processing capacity from the main leaf merchants. A second new player on the floors – Premium TAMA – was a subsidiary of the Tobacco Association of Malawi (TAMA), which historically has represented estate owners' interests.

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[7] J. Van Donge. 'The fate of an African 'chaebol': Malawi's Press Corporation after democratisation', The Journal of Modern African Studies 40, 4 (2002), pp. 651-681.

[8] The first three main tobacco leaf companies have been located in Malawi since the 1960s and Limbe Leaf became the dominant leaf merchant with the withdrawal of the Imperial Tobacco Company in the early 1980s. For an overview of the history of tobacco production and marketing in Nyasaland/Malawi over the past 100 years, see M. Prowse, M. (2013) 'A history of tobacco production and marketing in Malawi, 1890–2010', *Journal of Eastern African Studies*, 7, 4, (2013), pp.691-712.

[9] M. Prowse, M. 'A Comparative Value Chain Analysis of Burley Tobacco in Malawi: 2003/04 and 2009/10. *IOB Working Paper 2011:09* (Antwerp, Institute of Development Policy and Management, University of Antwerp, 2011).

Premium TAMA constructed its own processing plant to overcome larger firms' control of capital goods. A long-standing agricultural input company – the Agricultural Trading Company (ATC) – also started to buy burley on the floors. Whilst the new players increased competition, and smaller firms were able to increase their market share each day without being intimidated by the larger companies, buying tobacco in Malawi remained a structured affair (on this point, see Prowse, 2011, who describes the precise daily share out on the auction floors).[10] It should also be noted that at this time, each of the main leaf merchants mainly supplied a specific cigarette manufacturer: Alliance One supplied Philip Morris; Limbe Leaf supplied BAT; and Africa Leaf naturally supplied Japan International Tobacco.

The expansion of contract farming in Malawi can be traced to Limbe Leaf's purchase of Kasungu Flue-cured Tobacco Authority (KFCTA) in 2000 and the contracting of 900 smallholder farmers on KFCTA land to produce flue-cured tobacco. Since the 2002/03 season Dimon started contracting 2,500 smallholders in Kasungu, Lilongwe, south Mzimba and Rumphi. By the end of this decade, between 20-40% of the annual burley crop was produced through contract farming. Part of this expansion was due to the merger of Dimon and Stancom in 2005, as Alliance One started to contract NASFAM farmers and expanded operations into Ntchisi, Zomba and Namwera (NASFAM stands for the National Smallholder Farmers' Association of Malawi). Subsequently, Alliance One also started creating their own clubs, by hiring extension workers and providing credit through tripartite agreements with Opportunity International and the National Bank. At the time this research was planned (2012) and implemented (in 2014), Alliance One was the leading leaf merchant contracting smallholders in Malawi. It operated a sophisticated and technologically advanced system of contract farming

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[10] *Ibid.*

where smallholders were encouraged to move through production tiers with the promise of better inputs and broader products and services. The remainder of the article is structured as follows: Section 2 offers a literature review of gender, contract farming and intra-household models; Section 3 describes the methodology and methods; Section 4 reports our results; Section 5 offers a discussion of these findings before the final section concludes.

Section 2 - Gender and contract farming

Gender inequalities are recurring and substantiated matters of concern in the literature on contract farming.[11] The literature highlights how women-headed households are generally excluded from contracting schemes and gender conflicts often arise within married households participating in contract farming. Empirical evidence suggests that the widespread neglect of gender sensitivity in contract design and implementation jeopardizes the success rate of such schemes, since gender discrimination and conflicts potentially depress productivity levels.[12] Indeed, mainstreaming gender equity in value chains has become an important topic in recent years.[13]

Whilst the literature on micro-credit highlights that women are frequently included in such schemes (with ambivalent consequences), they are often avoided by firms conducting contract

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[11] M. J. Watts, 'Life under Contract: Contract Farming, Agrarian Restructuring, and Flexible Accumulation', in P. D. Little and M. J. Watts, *Living under Contract: Contract Farming and Agrarian Transformation in Sub-Saharan Africa*, (, Madison, Wisconsin and London, The University of Wisconsin Press, 1994) pp. 21-77;

[12] Watts, *Life under contract: Contract Farming*. G. Porter and K. Phillips-Howard, K. 'Comparing Contracts: An Evaluation of Contract Farming Schemes in Africa' *World Development*, 25, 2 (1997) pp. 227-238.

[13] S. Barrientos, S. 'Gendered Global Production Networks: Analysis of Cocoa-Chocolate Sourcing', *Regional Studies*, 48, 5 (2014), pp. 791-803; D. Rubin and C. Manfre 'Promoting Gender-Equitable Agricultural Value Chains: Issues, Opportunities, and Next Steps' in A. R. Quisumbing, R. Meinzen-Dick, T.L. Raney, A. Croppenstedt, J.A. Behrman and A. Peterman, A. (eds.) *Gender in Agriculture: Closing the Knowledge G*ap, (Dordrecht, FAO and Springer, 2014), pp. 287-313.

farming due to discriminatory structural barriers in access to land, credit, technology, extension services and education. Firms usually perceive that women-headed households are a less secure option regarding guaranteed supply. Many case studies show that men are the preferred contracting party by agro-industrial firms, regardless of whether women carry out the majority of contract-related work within the farming household. For example, Von Bülow and Sørensen found that the contracting firm in a tea out-grower scheme in Kenya only "issue[d] tea licenses to male household heads on the basis of their title deeds to land".[14] Restricted access to land ownership and to other productive resources also explained the very limited participation of women-headed household's participation in Porter and Phillips-Howard's evaluation of barley and sugar schemes in Nigeria and South Africa. In the Nigerian case the authors explain that only a limited number of women were directly contracted in barley production because of their limited funds to invest in irrigation technology and to hire additional farm labourers. Likewise, the vast majority of contract holders in the South African sugar schemes were men.[15]

Underrepresentation of women contract holders appears to be symptomatic for schemes in sub-Saharan Africa. Elepu and Nalukenge observed low involvement among women in sorghum (12,3%), sunflower (15,5%), and rice (30,4%) contract farming in Uganda.[16] Maertens and Swinnen noticed that women were mostly excluded in CF schemes in Senegal: only two women each held contracts in their samples of French bean (n=73) and mango growers (n=58).[17] Moyer-Lee and Prowse highlight how contract farming of tobacco in Malawi excludes poorer smallholders, including many women-headed households.[18] Outside of Africa, Raynolds and

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[14] D. von Bülow and A. Sørensen., 'Gender and Contract Farming: Tea Outgrower Schemes in Kenya', *Review of African Political Economy*, 20, 56 (1993), pp. 41.
[15] Porter and Phillips-Howard, *Comparing Contracts: An Evaluation of Contract Farming Schemes in Africa*
[16] G. Elepu and I. Nalukenge 'Contract Farming, Smallholders and Commercialization of Agriculture in Uganda: The Case of Sorghum, Sunflower, and Rice Contract Farming Schemes', *The Center for Effective Global Action Working Paper No. AfD-0907*, (UC Berkley, 2009).
[17] M. Maertens and J. Swinnen, J 'Gender and Modern Supply Chains in Developing Countries', *The Journal of Development Studies*, 48, 10 (2012), pp. 1412-1430.
[18] Moyer-Lee and Prowse, *How traceability is restructuring Malawi's tobacco industry*

Koczberski describe the same situation in tomato contracting in the Dominican Republic and oil palm production in Papua New Guinea, respectively.[19] This not to say that women-headed households do not perform well within many schemes when they are included, but that they face considerable barriers in entering schemes.

The exclusion of women-headed households also appears to be partly determined by the nature of the crop in question. For example, within horticultural production, Masakure and Henson found that women formed the majority of contract farmers in Zimbabwe.[20] Interestingly, two older studies by Watts et al and Little and Dolan again indicate little gender bias within vegetable production as this dovetailed with a socially-assigned domain of food production.[21]

Dolan's (2001) illustrative case study of horticulture producer in the Kenyan district of Meru provides some additional insights: that men tend to appropriate crop production as soon as it becomes profitable, even when crops which are traditionally classified as a 'woman's' crop (e.g. vegetables).[22] Thus, patriarchal control over family labour, alongside other persisting ideology-based gender assumptions and behavioural patterns, reinforce the structural gender barriers and explain why most contracting firms in most sectors continue to show a strong preference towards entering into contracts with men who are often the 'owners' of use rights

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[19] L. Raynolds, 'Wages for Wives: Renegotiating Gender and Production Relations in Contract Farming in the Dominican Republic', *World Development*, 30, 5 (2002), pp. 783-798; G. Koczberski, 'Loose Fruit Mamas: Creating Incentives for Smallholder Women in Palm Oil Production in Papua New Guinea', *World Development*, 35, 7 (2007), pp. 1172-1185.

[20] O. Masakure and S. Henson, 'Why do small-scale producers choose to produce under contract? Lessons from non-traditional vegetable exports from Zimbabwe', *World Development*, 33, 10 (2005), pp. 1721-1733;

[21] M. Watts, P. D. Little, C. Mock, M. Billings and S. Jaffee, 'Contract Farming in Africa: An Executive Summary' *IDA Working Paper No. 366* (Binghampton, New York, Institute for Development Anthropology, 1988); P. Little and C. Dolan, 'What It Means To Be Restructured: Non-Traditional Commodities and Structural Adjustment in Sub-Saharan Africa' in A. Haugerud, P. Stone and P. Little (eds.), *Rethinking Commodities: Anthropological Views of the Global Marketplace* (Boulder, CO, Rowman and Littlefield, 2000), pp.59–78.

[22] C. Dolan, 'The 'Good Wife': Struggles over Land and Labour in the Kenyan Horticultural Sector', *Journal of Development Studies*, 37 3 (2000) pp. 39-70.

over land, often regarded as the 'real' farmers and are believed to be the sole decision-maker within the household.[23]

Intra-household dynamics

The contract farming literature suggests that through contracting "the intra-household distribution of labour/income is often altered to the detriment of women's interests".[24] Watts (1994) illustrates such an argument through case studies from The Gambia and Cameroon. In both cases the labour burden on wives increased significantly when their husbands joined irrigated rice schemes, which allowed (and contractually required) two harvests instead of one each year. In some cases wives responded by withdrawing their labour or by demanding compensation for their additional work, not least because contract farming conflicted with subsistence farming responsibilities.[25] Such competing labour claims were also obvious in von Bülow and Sørensen's case of Kenyan tea growers, which furthermore demonstrated that women's resistance also occurs if husbands do not spend the income from contract farming on the welfare of other household members. The resulting gender conflict helped to explain low productivity or complete abandonment of some tea parcels.

The examples above nurture the debate on intra-household dynamics within contracting schemes, leading to a critique of the unitary household model.[26] Within this model, the household is treated as a single decision-making unit. It has a joint utility function, a benevolent

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[23] *Ibid.*

[24] M. Prowse, 'Contract Farming in Developing Countries: A Review', A Savoir, 12 (Paris: Agence Française de Dévelopement, 2012), pp. 25.

[25] Watts, *Life under contract: Contract Farming.* Von Bülow and A. Sørensen., *Gender and Contract Farming.*

[26] Doss, C. 'Testing among Models of Intrahousehold Resource Allocation' *World Development*, 24, 11 (1996) pp. 1597 – 1609.

household head whose preferences reflect concern for all household members and who maximizes household utility under conditions of perfect information and perfect competition.[27] An alternative conceptualization of the household is as a site of co-operative conflict: that households are constituted by multiple actors with varying and often conflicting preferences, interests and opportunities highlights how conflict originates from asymmetrical entitlements and the division of labour between husbands and wives, while cooperation is driven by joint interest in the overall well-being of the household.[28] Here, conflicts of interest are viewed against a background of pervasive cooperative behavior to maximize efficiency. Women's bargaining power certainly reflects a concern for household well-being, but also personal interest in the family setting, including the perception of each individual's contribution to the collective.

Raynold's (2002) empirical work in the Dominican Republic offers an example of this model of cooperative conflict through highlighting wives' subtle renegotiation of rights and responsibilities among contracted tomato farming households.[29] By refusing to openly challenge the dominant position of their husbands and ensuring them of their unconditional cooperation, many wives instead successfully claimed payments for labour contributions through arguing that wage labour norms should be fulfilled by the contracting firm.

[27] G. S. Becker, *A treatise on the family* (Cambridge MA, Harvard University Press, 1981). For critical summaries of this model see C. Doss 'Intrahousehold Bargaining and Resource Allocation in Developing Countries', *The World Bank Research Observer*, 28, 1 (2013) and Quisumbing et al, *Gender in Agriculture: Closing the Knowledge Gap*

[28] See E. Boserup, *Women's Role in Economic Development*, (London, Allen and Unwin, 1970); Sen,A. 'Gender and cooperative conflicts', *WIDER Working Paper 18*, (Helsinki Finland, World Institutue for Development Economics Research, 1987); A. Sen 'Gender and Cooperative Conflicts' in Irene Tinker (ed.) *Persistent Inequalities: Women and World Development* (New York, Oxford University Press, 1990), pp. 123–149; L. J. Haddad, J. Hoddinott and H. Alderman, H, *Intrahousehold resource allocation in developing countries*, (New York, John Hopkins University Press, 1997); B. Agarwal, 'Bargaining and Gender Relations: Within and Beyond the Household' *Feminist Economics*, 3, 1 (1997), pp. 1-51.

[29] L. Raynolds, 'Wages for Wives: Renegotiating Gender and Production Relations in Contract Farming in the Dominican Republic', *World Development*, 30, 5 (2002), pp. 783-798.

Consequently, wives insisted they received money from the company and not from their husbands, although it was the latter that collected the payments.[30]

When wives participate in remunerative activities such as export crop production or the labour market, it is more likely they have greater bargaining power within the household. This is also the case when they have greater 'voice' to enter into the household bargaining process and 'exit' opportunities (the socially and economically determined alternatives in the absence of an agreeable solution).[31] Koczberski's study on palm oil in Papua New Guinea offers a good example of using 'voice' within this model of cooperative conflict.[32] Koczberski highlights how the palm oil firm endured considerable losses due to wives' refusal to collect loose oil palm fruit bunches from the ground after men had harvested the fresh bunches from trees (as payments were made directly into husband's bank accounts).[33] Koczberski explains that by issuing harvest payment cards to women, the rate of collecting loose oil palm fruits increased.[34] Women were now given an incentive to participate in the contract as they could receive income separately from their husbands. This raised productivity of the whole scheme, reduced marital conflicts, strengthened household cooperation and income, and improved the financial autonomy of women.

But the extent to which collective models accurately represent intra-household dynamics is debated. Udry as well as Vermeulen both critique how, when accounting for differential preferences of members, households fail to maintain Pareto efficiency.[35] Udry's work using

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[30] Von Bülow and A. Sørensen., *Gender and Contract Farming,* also highlight how collective protests of women in Tanzania and Kenya helped them to gain a share of the income from tea contract farming. Such wages may well not be equivalent to men's wages as C. Dolan, *The 'Good Wife': Struggles over Land*, Barrientos, *Gendered Global Production Networks*, and Maertens and Swinnen, *Gender and Modern Supply Chains*, highlight steep gender wage gaps in vegetable cocoa, and French bean production, respectively.

[31] E. Katz,'The intra-household Economics of Voice and Exit' *Feminist Economics*, 3, 3 (1997) pp. 25-46.

[32] Koczberski, *Loose Fruit Mamas: Creating Incentives*

[33] Ibid.

[34] Ibid.

[35] Pareto efficiency refers to when no individual can be made better off without making at least one individual worse off. See C. Udry, C. 'Gender, agricultural production, and the theory of the *household' Journal of*

data from Burkino Faso highlights how the allocation of labour across plots controlled by men and women is far from optimal as both the variance of yields and input application is greater within households than between households (due, possibly, to the lack of security over usufruct land).[36] Vermeulen (extends and formalizes such non cooperative models of the household.[37] More recent overviews by Doss, Kebede et al, and Anderson et extend these discussions.[38] Doss highlights how the assumption of Pareto efficiency appears to hold in some contexts but not in others. Kebede et al test Pareto efficiency in Ethiopia using experimental data and firmly reject it explaining the lack of cooperation between household members as being due to marital security considerations.[39] Anderson et al highlight how in addition to the lack of Pareto efficiency, non-cooperative models are more dynamic (in contrast to stable co-operative models) as actors react to new circumstances and information to maximize individual (but not overall) efficiency and utility. Our second and third research questions take their points of departure within the rich literatures on cooperative and non-cooperative household models. In both cases, a confirmation of the hypothesis would lend some weight to support the model of cooperative conflict.

Section 3 – Context, methodology and methods

Political Economy, 104, 5 (1996), pp. 1010-1046; F. Vermeulen, F. 'Collective household models: principles and main results' *Journal of Economic Surveys*, 16, 4 (2002), pp. 533-564.

[36] Udry, *Gender, agricultural production*

[37] Vermeulen, *Collective household models*

[38] Doss, *Intrahousehold Bargaining and Resource Allocation;* B. Kebede, M. Tarazona, A. Munro and A. Verschoor, 'Intra-household efficiency: An experimental study from Ethiopia', *Journal of African Economies*, 23 , 1 (2014), pp. 105-150; C. I. Anderson, T. W. Reynolds and M. K. Gugerty, 'Husband and Wife Perspectives on Farm Household Decision-making Authority and Evidence on Intra-household Accord in Rural Tanzania', *World Development*, 90 (2017), pp. 169-183.

[39] V. Iversen, C. Jackson, B. Kebede, A. Munro and A. Verschoor, 'Do spouses realise cooperative gains? Experimental evidence from rural Uganda' *World Development*, 39, 4(2011) pp. 569-578.

This pilot study utilized a clustered randomized design with two partners in Malawi: the National Smallholders' Farming Association of Malawi (NASFAM) and Alliance One International, a tobacco leaf merchant. The research focused on Kasungu District in the Central Region. Kasungu is one of the largest districts in Malawi stretching from Lilongwe in the south to Mzimba in the north. The district is bordered by Kasungu National Park in the west and extends into Nkhotokhota Game Reserve in the east. Kasungu is divided into six Extension Planning Areas (EPAs) for the purposes of agricultural extension - Santhe, Lisasadzi, Kasungu/Chipala, Chamama, Kalaluma and Chalo. Kasungu town is the major urban centre in the district, and the district has historically been a Malawi Congress Party (MCP) stronghold, due, in large part, to Kamuzu Banda, the first the Prime Minister and President of Malawi, originating from the district. Kasungu encompasses 787,800 hectares, of which 324,000 hectares is arable land. Almost half of the arable land area is customary land, whilst the other half is estate land on a leasehold or freehold basis (mainly found in Chamama in the east, and also in Santhe in the south). Within the customary land, Kasungu contains a patchwork of land ownership and inheritance practices. To understand the reasons for this mosaic of land ownership, it is important to delve into the history of the district in some depth.

Historically, what is now Kasungu district was part of the Chewa Maravi kingdom of the 16th century.[40] Both Chewa and Tumbuka populations had settled in Kasungu from what is now the Democratic Republic of Congo at a similar time with the Chewa dominating the flat Kasungu plain and the Tumbuka settling in the hills just north of the plain in Mzimba.[41] From the early decades of the 1900s onwards, Tumbuka groups starting settling into northern Kasungu

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[40] H. W. Langworthy, 'Chewa or Malawi Political Organizations in the Precolonial Era' in B. Pachai (ed.), *The Early History of Malawi* (London, Longman, 1972), pp. 102-122.
[41] The Tumbukas who had settled in Mzimba were subsequently dominated by the Ngoni (from southern Africa) from whom the Tumbuka assimilated the practice of paying *lobola* (bride price).

stimulated by a search for good quality agricultural land (see also Prowse who describes the rapid expansion of fire-cured tobacco at this time in the Central Region, stimulated by the activities of two colonial estate owners, Barron and Wallace).[42] This process of migration and settlement into Kasungi district has continued since this time with 'strangers', whether from Mzimba, Dowa, workers for the tobacco estates or visiting annual tenants from the Southern Region (who were, in Kamuzu's time, bussed up from districts in the south) settling into villages in Kasungu and being assimilated into everyday interactions and practices. Consequently, villages across the district contain a mixture of languages, with Chewa and Tumbuka dominating, and a range of customary land ownership and inheritance practices. For example, matrilineal conventions in Kasungu are that usufruct rights over land are inherited from a maternal uncle or, in practice, from other members of the mother's family, whilst the patrilineal pattern is that usufruct rights over land are obtained from a father or grandfather. However, whilst the inheritance of land may follow these conventions, in Kasungu decisions about how these land use rights are operationalized is almost exclusively vested in husbands. It is common for villages in Kasungu to contain both matrilineal and patrilineal inheritance practices, depending on the genealogy of residents. More broadly across Kasungu district, Chewa villages do not generally practice *mkamwini* (literally, he who belongs somewhere else) where a man gains access to land through virilocal marriage (in other words, that the man moves to his wife's village), but the patrilocal practice of *chitengwa*, where a woman goes to live in her husband's village. So, to summarise, whilst the inheritance of land follows a mixed bilineal pattern within and across villages in Kasungu, the social convention is that husbands make decisions about how land is used.

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[42] M. Prowse, 'A history of tobacco production and marketing in Malawi, 1890–2010' *Journal of Eastern African Studies*, 7, 4 (2013), pp. 691-712.

The aim of this particular study was to evaluate the innovation – formally including wives within tobacco contracts – within the constraints of a limited budget envelope. Alliance One's contracting operations in Malawi were with farming clubs that average 6 members. As outcomes within clubs may be correlated due to the weather or because club members talk, the sample size needed to be adjusted. Based on previous data on intra-cluster correlation coefficients, a significance level of 0.10, statistical power at 80% and a 20% effect size, we planned to include 100 clubs totalling 600 households (300 participant vs. 300 comparison) if we worked in specific schemes which had low intra-cluster correlation coefficients. Clubs were therefore randomly assigned in six contracting schemes run by Alliance One in Kasungu district: Chatoloma; Kasungu Central 1; Kasungu Central 2; Mangwazu; Mphomwa; Wimbe.

In fact, the average size of clubs in these schemes was only 3.78 (surprisingly small for Malawi). We assigned 416 households in 110 clubs to 'participant' and 'comparison' groups. AOI was tasked with distributing soya seed to wives in 208 households in 55 participant clubs in December 2013. The project budgeted for 3 MT of soya. Selected husbands and wives in each scheme came to a central location and wives collected soya seed in multiples of 12.5 kgs, suitable for planting half an acre of soya with an estimate yield of 320kg/acre. The household kept one copy of the soya contract and AOI retained the other. Over 2.5MT of soya seed were distributed but only 48% of selected households accepted the seed (100 from 208). There were a variety of reasons for this: poor communication and late distribution by AOI as well as some households declining the seed as it would divert attention from tobacco. We also learnt that Alliance One had distributed soya seed to husbands in some HHs in 2012/13 and deducted the cost directly from gross tobacco proceeds without consulting smallholders (thus reducing uptake of this particular intervention).

We conducted survey questionnaires in the vernacular with 322 of the 416 households, 143 treated households and 179 comparison households. Questionnaires were translated from English in plenary with 10 enumerators, and responses were recorded in English. Both husbands and wives were approached for interview, 239 wives participated. Eighteen households were headed by women (4.3% of all households) which are retained in this analysis. Of the 100 households which received soya, only 76 planted (representing 2.1MT of the 2.5MT distributed).

Data collection in July 2014 encountered a number of challenges. First, the 2013/14 tobacco season was very poor: low yields and low prices at auction meant many farmers were failing to repay loans to AOI and were actively avoiding contact with AOI employees. Moreover, in one area, the timing of fieldwork in Kasungu overlapped with debt collectors hired by AOI trying to recoup loans. Due to these reasons, some households were reticent about attending centralised meetings. We used two tactics to increase participation in the household survey. We attended meetings organised by AOI for the 2014/15 season and we simply visited households. These issues highlight some of the generic challenges when conducting research with an agricultural merchant: respondents may view the research team as an extension of the firm and limit the degree to which a rapport is established. They also highlight the inherent challenges of an experimental design, whereby non-compliance requires the need to be flexible and innovation in terms of collecting and analysing data.

The survey questionnaire included both closed questions for numerical data, open questions for qualitative data and visual data on the household's well-being. This article mainly reports numerical data with the exception of household well-being where we utilize an ordinal ranked variable created from a visual household trajectory. Importantly, this article offers self-reported data from both husbands and wives.

To generate results we run three models: an Ordinary Least Squares (OLS) model with dummy (that is, 0/1) variables for all 6 schemes to control for spatial confounding factors: a further OLS model with a fuller set of (observable) household characteristics as controls; and an instrumental variable (IV) regression model using initial randomisation as an instrument. As many statistical and econometric practices use terms that act as a barrier for broader social scientists, we now describe the research design (both the research design, and the statistical approach) in everyday language.

First, the research design. We used a clustered randomized design which used random assignment of participating and non-participating households at the club level. Random assignment is expected to balance observable (such as household characteristic like age or education level) and unobservable characteristics (such as risk preferences, or innate technical knowledge, which are rarely captured accurately in survey instruments) across both groups. But doing so requires sampling sufficient units. In this case, contract farming was organised in small clubs and the budget envelope for the study was limited. Due to this, the study compared 55 participant units with 55 comparison units. Ideally, the study would have sampled a much larger number of clubs to ensure statistical power. In other words, that we could claim that 80% or 90% of experiments with the same sample size in this context would produce the same results with a similar level of confidence. But the budget envelope for the study would not stretch any further than 55 participant clubs and 55 comparison clubs. Randomizing at the level of clubs is important as sub units (households) within each cluster (clubs) tend to share influences such as rainfall patterns, agricultural extension advice, often live in the same village and may well be related in some shape or form. So the outcomes for impact variables within each cluster (that is, farming club) tend to be correlated. Because of this, it is important to sample at the level of clusters and not at the level of individuals. Further important reasons are the ethical and political considerations of working with all members within a farming club and not just a sub set.

Working with only a proportion of members would lead to considerable complications within the club and would be impractical.

Second, the three models that were run on the survey data. These were run to try and overcome the shortcomings and challenges within the randomized design. First, we run an Ordinary Least Squares (OLS) regression with binary variables representing the schemes that each club was a member of, along with a single binary variable showing if each household is a participant or comparison household. The coefficients from this regression show estimates for impact variables controlling for spatial differences at the scheme level. The second model does the same but adds a set of household characteristics to further try to control for observable characteristics across participant and comparison groups (but not unobservable characteristics) that may have been skewed due to non-compliance (in other words, that many of the participant and non-participant households didn't act in the way the design of the study encouraged). This is a typical shortcoming of experimental designs and it means that the balancing of observable and non-observable characteristics is undermined. In these models, we add three household variables: one representing household labour (adult equivalence), one representing natural capital (total land), and one representing location at the formation of the household (which, as we will see below, varies significantly between the intervention and comparison groups).

The third model uses a slightly different statistical technique: an instrumental variable (IV) regression to counteract the unbalancing of observable characteristics in participant and comparison groups caused by non-compliance as well as balancing unobservable characteristics between the two groups. If such unobservable characteristics are correlated with participation, normal regression estimates (such as models 1 and 2) will be biased as the participation variable

will be correlated with the residual error term (that is, the portion of the variance in the dependent variable that is not explained by the independent variables in the model).

The rationale of the IV approach is that we can control for the influence of non compliance and unobservables by using an additional variable that has two properties. First, that it is uncorrelated with characteristics that may affect outcomes. Second, that it is correlated with the relevant independent variable that we are attempting to assess the impact of (specifically, in this case, the planting and harvesting of soya as part of the distribution of soya to wives within a contract farming scheme). Fortunately, the initial randomisation variable meets these two criteria. The logic here is that the use of this instrumental variable 'cleans' the participant variable (that is, the planting and harvesting of soya variable as part of the distribution of soya to wives within a contract farming scheme) by separating out and discarding the part of the participant variable that is correlated with the error term (to reiterate, this is the portion of the variance in the dependent variable that is not explained by the independent variables in the model). The new 'cleaned' participant variable is now uncorrelated with the error term and is not tainted by (observable or unobservable) characteristics that are affecting outcomes. In this way, an IV regression controls for characteristics that may not be balanced between both groups (which, in this case, includes both unobservable characteristics as well as observables which have been skewed due to non compliance). This form of regression model offers us the cleanest set of estimates of the three models. Whilst these models attempt to counteract non-compliance, they do not counteract the small sample size in the study which has resulted in low power (in other words, that we are less than 80% certain that an identical design and intervention will lead to the identical result).

Before we report findings from the three regression models, we show descriptive statistics for participant, non compliers and comparison households using straightforward Analysis of Variance to assess statistical significance for scale variables and Chi-squared for categorical variables. These tools shouldn't be too challenging for readers as they are the bread and butter for social scientists trying to assess whether differences between sub groups are real or due to chance.

Section 4 – Results

Tables 1 and 2 describe basic characteristics of the households in the sample as reported by husbands and wives.

<Tables 1 and 2 around here>

Analyses of variance and Chi-squared tests of data from husbands and wives data show no significant difference in household characteristics between comparison, non compliers and participant households with one exception: residence patterns at marriage (the location at formation variable). Here, husband and wife data showed an unusually high frequency of non compliers from patrilocal villages (where wives move to their husband's village). For both spouses, around one quarter of patrilocal households did not comply (with the data from husbands showing significance at the 99% level). The descriptive statistics in Tables 1 and 2 reinforce how land ownership and inheritance patterns in Kasungu show a mixed pattern: that

whilst almost all households speak Chichewa, most households follow patrilocal residence and patrilineal inheritance practices.

In addition to household characteristics, it is important to check for any spatial biases created by the non-compliance. Chi-squared tests on both husband and wife data show an unequal distribution of participant categories in four of the six schemes (not shown). In light of this, the first OLS regression model controls for spatial confounding factors when comparing participant and comparison groups by incorporating dummy variables for all 6 schemes.[43] We now report findings on our first hypothesis on repayment rates, and on soya production.

As AOI farming clubs are jointly and severally liable, we are only able to report club-level data on repayment rates. Table 3 shows findings from an ANOVA across comparison, non complier and participant households. Repayment rates are almost identical across groups.[44] Although the data is far from ideal, it adds some weight to suggest that our first hypothesis doesn't hold: in other words, that including wives in the contract did not improve repayment rates (nor did the intervention reduce repayments).

< Table 3 around here >

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[43] As already explained, we use a further OLS model with a fuller set of household controls. We also offer IV regression estimates using initial randomisation as an instrument.

[44] Regressing a dummy of participant clubs against repayment rates using the original randomization variable as an instrument shows a constant of 79.35 and an insignificant coefficient for participant clubs of -3.58.

Turning to soya, the majority of both husbands (68%) and wives (72%) welcomed the distribution of soya seed by AOI to wives stating that the tobacco leaf merchant should continue this practice. Tables 4 and 5 display descriptive statistics on soya production across comparison, non compliance and participant households for husbands and wives, respectively. They show findings which are counterintuitive. Analyses of variance show that participant households show significantly lower levels of soya production and yields as reported by both spouses. Husbands also report significantly lower sales of soya but higher prices per kg.

The regression estimates in Table 6 and Table 7 confirm these findings for husbands and wives, respectively. Despite receiving soya as an addition to their tobacco contract, wives in participant households reported that soya yields (163-260kg per acre) and production (93-118kgs) were significantly lower than in comparison households. Husbands reported that participant households produced 61-77kgs less soya, yields were down between 99-120kgs per acre, and households sold 22-29% less soya but received higher prices when they did sell (between MKW14 - 28). We return to these surprising results below.

< Tables 4, 5, 6 and 7 around here >

Our second hypothesis is that including wives in the contracts would improve collaboration within labour practices in households leading to better yields for key crops. Tables 8 and 9 shows coefficients for husbands and wives, respectively, from the three regression models. We assess impact of the intervention on tobacco, maize and groundnut yields. In tables that displays

regression coefficients, we show the unstandardized coefficient (and standard error) for the impact of the intervention. Significance levels are indicated by asterisks.

<Tables 8 and 9 around here >

Tables 8 and 9 show a discrepancy between the data reported by husbands and wives. Table 8 shows that husbands reported the intervention reduced maize yields by between 131kgs and 192kgs per acre (in other words, a considerable reduction of 10.7% to 18.2%). This is not corroborated by the responses from wives which show no significant differences between participant and comparison groups. The main channel through which the intervention would influence yields is the reallocation of household labour, especially the wife's or wives' labour.

Tables 10 and 11 below show the impact of the intervention on the proportion of labour on each main crop provided by the (senior) wife of the household. Table 10 shows mixed results for tobacco and soya and only one significant finding – that wives reduced their allocation of labour to maize by -6% according to the IV estimates (at the 5% level of significance). Table 11 shows wives responses. Here we see wives stating that they reduced labour input to soya (which averages 50% of total labour) by 7% on average, significant at the 10% level. We discuss this finding further below.

< Tables 10 and 11 around here >

Our third hypothesis was that including wives in contracts would improve household's well-being. Here we use self-reported measures of improvement/worsening based on visual trajectories completed by the respondent which were converted into a ranked ordinal variable (with 1 as strong improvement and 5 as strong deline). Again, we utilize the same set of regression models. Once again, whilst the data is far from ideal, the regression estimates in Tables 12 and 13 show a significant worsening of household well-being, as reported by husbands. Wives, on the other hand, report no significant change in the household's condition.

< Tables 12 and 13 around here>

Overall, the estimates suggest none of the three hypotheses hold: there is no sign of greater repayment rates, there is no evidence to suggest key crop yields improved (indeed, husbands report that maize yields declined considerably), and husbands also state that household well-being declined significantly (although this is not corroborated by wives).

It is only regarding soya where there is agreement between the responses given by husbands and wives: production and yield appear to have declined; husbands also report that the proportion sold also declined but that sales realized a higher price (presumably due to the smaller quantities marketed). We also have some evidence that wives withdrew labour from soya within participant households.

Section 5 - Discussion

How can we interpret these findings from the data from husbands and wives? On first glance, the lack of accord between the responses given by husbands and wives is unsettling: how can we be certain what the precise figures are if we have such widely differing accounts of production and the allocation of labour? On reflection, though, as self-reported data is known to be influenced by the interpretations of the participants of their lived experience, the discord between husbands and wives should not be seen as noise to be discarded but music to be appreciated: it is offering us a rare window into household-level dynamics.

The starting point is that most husbands and wives welcome the provision of soya to wives by AOI. But both prefer this to be in the form of a separate contract, not tied to tobacco, which would be paid directly to wives. The way our intervention was structured meant soya seed was added as a credit on the husband's tobacco contract so husbands had some claim on income from the sale of soya (which was sold through local channels, not back through AOI). In other words, women were not certain the time they spent on the soya crop would be remunerated. This helps to explain the findings that soya production and yield declined within the participant group: there is evidence that wives in the participant group allocated a smaller proportion of labour to soya. It is common practice in this area of Malawi that wives are still not supposed to ask about the husband's income or their income-generating activities: formal subservience is still the norm. Generally speaking, husbands do not welcome involvement by the wife in the commercial farm business (although they certainly welcome their labour). There is also some evidence to suggest husbands did gain greater control over soya sales in participant households: they assert smaller sales volumes and higher prices (suggesting that the sales of soya were timed differently). These suggestive findings reflect the broader process of rapid soya commercialization in Malawi in the previous 5-10 years, such that husbands are now taking much greater control of the crop.

Turning to our first hypothesis, we found that repayment rates for participant and comparison groups were similar. In other words, that formal inclusion of wives in the contract had no impact. This is not too surprising when we consider that the 2013/14 seasons was marked by low prices for tobacco such that any spot market traders would not be able to offer high prices to tempt smallholders to sell immediately at the farm gate instead of waiting weeks or months for their cash from the auction floors. It is often in the context of unusually high prices in spot markets that high rates of side-selling occur (or when firm prices are so very low that farmers renege entirely on the contract). In addition, the role of independent tobacco traders has been severely circumscribed in recent years with greater control and regulation on the auction floors (for both open auctions of tobacco and the 'silent' auction for contracted tobacco).

Our second hypothesis postulated greater collaboration within the household leading to greater yields for key crops. Husbands surprisingly reported that maize yields in participant households were 10.7% to 18.2% lower. This is not corroborated by data from wives who, on average, provided 40% of the labour to maize, including harvesting, and who are often in control of maize use in the household. Our interpretation here is that husbands' responses partially highlight a fear that including wives within commercial production for AOI will detract from their domestic role in food production. In other words, that husbands are revealing concerns about changes in intra-household relations precipitated by the intervention. Indeed, we can also see that there is some evidence that husbands in the participant group believed that wives' labour contribution to maize declined whilst the responses from wives themselves (who would know best) show no significance difference.

Indeed, our last hypothesis, can be seen to lend weight to such an argument. The husband's responses in the participant group asserted that well-being had declined significantly over the previous season vis-à-vis comparison households. In contrast, wives stated no significant change had occurred. Again, we can understand the husband's more negative interpretation as

being a signifier of unease around the manner in which wives were incorporated into commercial transactions with the firm which were previously solely under his control. In particular, husbands' main income stream and, indeed, much of their social status in the community revolves around their position as a contracted tobacco farmer. Wives' 'intrusion' into this sphere appears to have caused some discomfort.

As highlighted above, the literature on contract farming highlights how women-headed households are generally excluded from contracting schemes and gender conflicts often arise within married households participating in contract farming. In this study, 5.6% of contract farmers were women-headed households, a much lower proportion that the incidence of women-headed households within rural Kasungu district as a whole which is closer to 15%. This highlights how the inclusion of women-headed households is partly determined by the crop in question – tobacco in Malawi is still a man's world and the social status of husbands can still revolve around the crop (see Prowse for a description of the gendered norms within the tobacco industry in the early 21st century).[45]

Our second and third research questions take their points of departure within the rich literatures on cooperative and non-cooperative household models. In both cases, a confirmation of the hypothesis would lend some weight to support the model of cooperative conflict. Within the literature, Udry as well as Kebede et al highlight a lack of cooperation within households due to a lack of stability such that overall outcomes are inefficient: individuals maintain control over resources to ensure their fall-back position in the event of a breakdown in the relationship is secure, reducing efficiency within the household.[46] Anderson et al also highlight how in non-

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[45] M. Prowse, 'Becoming a bwana and burley tobacco in the Central Region of Malawi', *The Journal of Modern African Studies*, 47, 4 (2009), pp.575-602.
[46] Udry, *Gender, agricultural production*; Kebede et al, *Intra-household efficiency: An experimental*

cooperative households, dynamism is the norm as new information and incentives reconfigure individual priorities which can reduce efficiency.[47] In this pilot study, formally including wives within a tobacco contract to grow soya has led to some counterintuitive results: wives withdrew labour from soya as the crop now fell outside of their domain, possibly contributing to shortfalls in yields and production. Husbands noticed the shortfall in soya production but not where their wives were allocating their labour: they believed wives were neglecting maize not soya, thus revealing their own concerns about the inclusion of wives in the contracting scheme. Overall, and as reflected in the preference for separate contracts by both spouses, formally including wives in contract farming did not lead to cooperation and the finding here do not lend support to models of cooperative conflict. In contract, including wives within a contract farming scheme led to non-cooperation between spouses and an inefficient and sub-optimal result. This highlights the strong need for gender sensitivity in contract design and implementation, including early formative research into decision making in the households, the preferences of husbands and wives and the most suitable crop choices within contracting schemes.

Section 6 - Conclusion

Findings from this pilot study suggest any contract farming firms considering broadening away from their core crop to start contracting broader (especially food) crops should consider how small interventions can lead to a reconfiguration of intra-household cooperation. Whilst specific outcomes will depend on the crops and context, there are good reasons to check whether including wives formally in the scheme through linked or separate contracts would enhance or

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[47] Anderson et al, *Husband and Wife Perspectives*

inhibit cooperation between husbands and wives. As highlighted by Koczberski, separate contracts for wives from the firm could allow greater independence and freedom for both husbands and wives, this allowing them greater choice in how they organise the intra-household division of labour and income.[48] In other words, firms need to take into account how Udry's work on household non-cooperation still accurately reflects separate spheres of control for spouses and inefficiency within households. In addition, the findings highlight one unexplored area of analysis: the lower levels of compliance within patrilocal villages.[49] The findings suggest that gendered community norms, inheritance patterns and residence patterns are playing a strong influence here – an area that further research should investigate.

What broader implications does the study hold for current debates on crop diversification in Malawi. First, that spousal control over crops can change rapidly. Whilst historically soya has been a key food crop in Malawi and mainly under wives' domain, rapidly commercialisation in Malawi in recent years has brought the crop into husbands' sphere of control (with implications for the intra-household division of labour, production and yields).

Second, that both the findings from this study and the literature on contract farming suggest that separate contracts away from the initial contract with husbands leads to better outcomes within the household and for the firm in question. A key lesson from this study is the need for early, formative research into the preferences of participating smallholders in terms of contract design and how the scheme will operate. Early qualitative insights on decision making, intra-

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[48] Koczberski, *Loose Fruit Mamas: Creating Incentives*
[49] Udry, *Gender, agricultural production*

household cooperation and gendered preferences will highlight key features that will need to be incorporated into schemes before piloting begins.

Third, the importance of the choice of crop within diversification. During the study, it became clear that soya has a greater labour trade-off with tobacco than, for example, groundnuts. Soya ripens first on the farm and harvesting needs to take place before the seed shatters in the earth. This conflicts with peak demand for tobacco labour: reaping mature leaves; sewing hands; placing the hands on sticks to cure in the barn. Soya is also subject to high price volatility in Malawi at the village level, leading to cycles of booms and busts. Crops which exhibit such labour and price characteristics may be treated with caution by smallholders. In this respect, early, formative research into crop choice will help to tailor additional crops to be context in question.

Fourth, that evaluations needs to be done at scale and with reliable partners. Fifth, that using data from both spouses offers a window on non-cooperation within households with practical relevance for firms conducting contract farming. Acknowledging that discrepancies in data responses from husbands and wives is not noise to be deleted but music to be appreciated offers further research avenues especially through ethnographic and qualitative methods, which may be able to shed light on the precise mechanisms at work within the household, community and society.

Broadening out further, the rapid growth of contract farming in Malawi has led to the entry of tobacco leaf merchants and manufacturers into new nodes of the value chain. At the same time,

Malawi's extreme dependence on tobacco has led to a renewed and much needed interest crop diversification as indicated above. The findings from this evaluation of one tobacco contract farming scheme suggests that if leaf merchants and manufacturers are serious about diversifying crops then they need to understand how household relations and societal norms intersect with agricultural production. Doing so will increase the likelihood that including other household members within contract farming schemes increases productivity with benefits for the family, farm and the firm in question.

Table 1 – Summary of household characteristics – Husband data

Scale							ANOVA
	Comparison	Non compliers	Participants	Overall	SD	No.	Sig.
Total household members	6,60	6,88	6,55	6,65	2,13	322	0.586
Adult equivalence	5,49	5,70	5,53	5,54	1,86	320	0.733
Total land under production (2012/13 acres)	5,72	5,81	5,77	5,75	3,02	322	0.978
Categorical							Chi-Sq.
	Comparison	Non compliers	Participants	Total	Df.	Value	Sig.
Polygamy							

	Comparison	Non compliers	Participants	Overall	Df.	Value	Sig.
1 Yes	23	10	11	44	2	0.099	0.952
2 No	142	56	61	259			
Total	165	66	72	303			
Woman-headed household				Overall	Df.	Value	Sig.
0 No	166	66	72	304	2	2.21	0.331
1 Yes	13	2	3	18			
Total	179	68	75	322			
Language				Overall	Df.	Value	Sig.
1 Chichewa	145	50	61	256	4	7.233	0.124
2 Chitumbuka	29	14	10	53			
3 Other	1	2	4	7			
Total	175	66	75	316			
Location at formation				Overall	Df.	Value	Sig.
1 Matrilocal	15	2	12	29	4	12.76	0.012***
2 Patrilocal	147	64	55	266			
3 Neither	15	1	7	23			
Total	177	67	74	318			
Inheritance pattern				Overall	Df.	Value	Sig.
1 Patrilineal	119	53	47	219	6	5.445	0.488
2 Matrilineal	13	2	6	21			
3 Dual access	19	4	7	30			
4 Other	27	9	15	51			
Total	178	68	75	321			

Table 2 – Summary of household characteristics – Wife data

Scale	Comparison	Non compliers	Participants	Overall	SD	No.	ANOVA Sig.
Total household members	6,77	6,63	6,69	6,72	2,20	257	0.914
Adult equivalence	5,71	5,53	5,59	5,64	1,91	254	0.809
Total land under production (2012/13 acres)	5,32	5,20	5,10	5,24	2.63	257	0.860
Categorical							
Polygamy						Df.	Value	Chi-Sq. Sig.
1 Yes	16	11	13	40		2	2.974	0.226
2 No	105	52	42	199				
Total	121	63	55	239				
Woman-headed household						Df.	Value	Sig.

					Df	Value	Sig.
0 No	121	63	55	239	2	3.335	0.189
1 Yes	13	2	3	18			
Total	134	65	58	257			
Language					Df.	Value	Sig.
1 Chichewa	98	46	45	189	4	2.902	0.574
2 Chitumbuka	31	18	12	61			
3 Other	4	0	1	5			
Total	133	64	58	255			
Location at formation					Df.	Value	Sig.
1 Matrilocal	20	6	9	35	4	3.691	0.449
2 Patrilocal	102	56	43	201			
3 Neither	10	2	5	17			
Total	132	64	57	253			
Inheritance pattern					Df.	Value	Sig.
1 Patrilineal	94	47	36	177	6	5.734	0.434
2 Matrilineal	11	2	8	21			
3 Dual access	13	6	7	26			
4 Other	15	10	7	32			
Total	133	65	58	256			

Table 3 – Analysis of variance on club-level repayment rates

	N	Mean	SD	SE
Comparison clubs	44	79,35	28,10	4,24
Non complying clubs	17	78,59	32,44	7,87
Participant clubs	33	76,16	31,30	5,45
Total	94	78,09	29,76	3,07

Sum of Squares	df	Mean Square	F	Sig.
197,01	2	98,507	109 ,89	0,90

Table 4 – Descriptive statistics on soya – Husband data

	Comparison	Non compliers	Participants	Overall	SD	Sig.
Soya area in acres	0,64	0,69	0,60	0,64	0,44	
No.	91	37	63	191		
Soya production in kgs	181,02	198,53	108,43	160,32	144,84	***
No.	89	36	62	187		
Soya yield in kgs per acre	307,46	332,97	191,93	274,07	202,61	****

No.	89	36	62	187		
Soya % sold	63,29	62,54	33,31	53,26	39,70	****
No.	87	35	60	182		
Soya price per kg in MKw	116,41	126,50	135,19	122,73	33,98	**
No.	71	30	27	128		

Table 5 – Descriptive statistics on soya – Wife data

	Comparison	Non compliers	Participants	Overall	SD Overall	Sig.
Soya area in acres	0,62	0,74	0,63	0,65	0.43	0.43
No.	56	36	36	128		
Soya production in kgs	206,18	212,97	97,22	177,17	189.74	0.01
No.	56	35	36	127		***

Soya yield in kgs per acre	361,25	286,06	173,72	287,37	259,28	0.00
No.	56	35	36	127		****
Soya % sold	63,44	51,29	47,07	55,29	41,10	0.15
No.	52	34	35	121		
Soya price per kg in MKW	118,48	125,48	114,67	119,29	40,04	0.68
No.	40	21	21	82		

Table 6 – Regression estimates on soya – Husband data

	OLS (1)	Sig.	OLS (2)	Sig.	IV	Sig.
Soya area in acres	-0,04		-0,03		-0,002	
	(0.07)		(0.07)		(0.04)	
Soya production in kgs	-73,71	***	-70,94	***	-61,4	*

	(23.63)		(23.11)		(32.05)	
Soya yield in kgs per acre	-120,42	****	-116,73	***	-99,11	**
	(32.94)		(33.66)		(44.63)	
Soya % sold	-22,52	****	-21,23	****	-29,3	***
	(6.21)		(6.36)		(8.64)	
Soya price per kg in MKW	14,19	**	13,75	*	28,92	**
	(7.58)		(7.73)		(12.36)	

Unstandardised coefficients and SEs in parentheses

OLS (1) Include scheme-level dummies only

OLS (2) Includes scheme-level dummies, adult equivalence, location at marriage and total land

IV uses initial randomisation as an instrument

Table 7 – Regression estimates on soya – Wife data

	OLS (1)	Sig.	OLS (2)	Sig.	IV	Sig.
Soya area in acres	-0,07		0,000		0,13	
	(0,09)		(0,08)		(0,16)	
Soya production in kgs	-118,492	***	-93,15	***	-102,35	
	(37,94)		(35,62)		(64,75)	
Soya yield in kgs per acre	-171,158	****	-163,09	****	-260,63	***
	(51,74)		(49,59)		(89,67)	
Soya % sold	-10,442		-11,23		-28,17	*
	(8,35)		(8,47)		(15,07)	

Soya price per kg in MKW	-7,870	-9,23	3,19
	(10,51)	(10,69)	(17,85)

Unstandardised coefficients and SEs in parentheses

OLS (1) Include scheme-level dummies only

OLS (2) Includes scheme-level dummies, adult equivalence, location at marriage and total land

IV uses initial randomisation as an instrument

Table 8 – Regression estimates on yields of key crops – Husband data

	OLS (1)		OLS (2)		IV	
Maize yields in kgs per acre	-135,33	**	-131,48	*	-191,99	*
	(74,43)		(75.82)		(117,51)	
Tobacco yields in kgs per acre	9,31		12,99		-12,17	
	(37.24)		(37,62)		(58,05)	
Groundnut yields in kgs per acre	14,74		22,57		-47,09	
	(48,79)		(49,50)		(77,83)	

Unstandardised coefficients and SEs in parentheses

OLS (1) Include scheme-level dummies only

OLS (2) Includes scheme-level dummies, adult equivalence, location at marriage and total land

Table 9 – Regression estimates on yields of key crops – Wife data

	OLS (1)	OLS (2)	IV
Maize yields in kgs per acre	-8,347	-11,84	10,95
	(88,02)	(86,63)	(156,28)
Tobacco yields in kgs per acre	-18,930	3,27	122,15
	(56,16)	(53,93)	(96,76)
Groundnut yields in kgs per acre	49,92	27,32	156,58
	(55,85)	(56,82)	(98,29)

Unstandardised coefficients and SEs in parentheses

OLS (1) Include scheme-level dummies only

OLS (2) Includes scheme-level dummies, adult equivalence, location at marriage and total land

Table 10 – Proportion of labour provided by (senior) wife – Husband data

	OLS (1)	OLS (2)	IV
Maize - what proportion did the wife perform? %	-2.2	-2.28	-6.13**

	(1.80)	(1.80)	(2.84)
Tobacco - what proportion did the wife perform? %	1.45	0.88	-2.48
	(1.77)	(1.78)	(2.85)
Soya - what proportion did the wife perform? %	-1.01	0.52	-5.34
	(2.75)	(2.83)	(3.85)
Groundnuts - what proportion did the wife perform? %	-1.91	-2.07	-6.05
	(2.90)	(2.89)	(4.49)

Unstandardised coefficients and SEs in parentheses

OLS (1) Include scheme-level dummies only

OLS (2) Includes scheme-level dummies, adult equivalence, location at marriage and total land

IV uses an initial randomisation as an instrument

Table 11 – Proportion of labour provided by wife – Wife data

	OLS (1)	OLS (2)	IV
Maize - what proportion did the wife perform? %	0,902	,267	2,053

	(2,21)		(2,17)		3,707
Tobacco - what proportion did the wife perform? %	1,54		,489		0,29
	(2,13)		(1,97)		3,63
Soya - what proportion did the wife perform? %	-7,74	*	-8,68	*	-7,739	*
	(4,66)		(4,72)		(4,66)
Groundnuts - what proportion did the wife perform? %	-0,21		-1,71		-0,211
	(5,08)		(5,15)		(5,08)

Unstandardised coefficients and SEs in parentheses

OLS (1) Include scheme-level dummies only

OLS (2) Includes scheme-level dummies, adult equivalence, location at marriage and total land

IV uses an initial randomisation as an instrument

Table 12 – Change in household well-being over previous 12 months – Husband data

	OLS (1)		OLS (2)		IV	
Household well-being trajectory	0,31	*	0,31	*	0,59	**

(Scale of 1-5 with 1 as strong improvement and 5 as strong decline)	(1,56)	(1,61)

Unstandardised coefficients and SEs in parentheses

OLS (1) Include scheme-level dummies only

OLS (2) Includes scheme-level dummies, adult equivalence, location at marriage and total land

IV uses an initial randomisation as an instrument

Table 13 – Change in household well-being over previous 12 months – Wife data

	OLS (1)	OLS (2)	IV
Household well-being trajectory	0,13	0,12	0,02

(Scale of 1-5 with 1 as strong improvement and 5 as strong decline)	(0,19)	(0,19)	(0,33)

Unstandardised coefficients and SEs in parentheses

OLS (1) Include scheme-level dummies only

OLS (2) Includes scheme-level dummies, adult equivalence, location at marriage and total land

IV uses an initial randomisation as an instrument