Centre for Tax Analysis in Developing Countries

Cross-cutting research agenda

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Centre for Tax Analysis in Developing Countries (TAXDEV)

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Executive summary

- The ultimate purpose of any tax system is to raise revenues to fund government expenditure on public services and investments. But tax policy is about much more than deciding how much revenue to raise. An effective tax policy is one that raises enough to fund the desired level of public spending, while causing the fewest harmful distortions to the economy, and distributing the burden of funding that spending across society in the way that is deemed fairest. That is, a good tax system is both economically (as well as administratively) efficient and equitable.
- All countries face challenges in designing and operating such an effective system of taxation. But these challenges are particularly acute in low and middle income countries, where the pressing need to raise revenue for increased investment in public services and infrastructure can be complicated by three important considerations. First, the desire to protect poorer citizens – in this case, often very poor – from further impoverishment due to taxation. Second, the pressure to maintain a competitive tax environment, particularly in relation to foreign direct investment. And third, weak administration and enforcement capabilities, in part due to the scale of the hard-to-tax informal sector.
- Recent years have seen a growing academic and policy interest in the design and effects of tax policy in low and middle income countries. There is a real need to review this growing evidence and draw out the implications for policymakers. There is also a need to generate new evidence on a number of practical issues facing tax policymakers and administrators in low and middle income countries, where empirical evidence is still sparse.
- The IFS's new Centre for Tax Analysis in Developing Countries (TAXDEV), established in 2016, will undertake a programme of research which aims to respond to these needs and address fundamental issues related to taxation in low and middle income countries. This document outlines four areas of research which will inform our "cross-cutting" research agenda.

- Firstly, we will examine the extent to which preferential rates of VAT for certain goods and services, consumed disproportionately by poorer households, do actually help poorer households. We will do this by contrasting the costs and distributional effects of the preferential rates with other, more targeted, forms of redistribution.
- Secondly, we will investigate the effect of VAT on firms' compliance with the tax system, and on their production decisions, contrasting it with the effect of simplified tax systems. Thus, we will generate evidence on the costs and benefits of operating simplified tax schemes for small firms, and setting relatively high VAT thresholds. We will also generate evidence on the tax gap, and on the efficiency of tax audits at different parts of the production chain.
- Thirdly, we plan to explore more broadly the responses of firms to tax policy and administration thresholds. In particular we will estimate the extent to which firms bunch just below such thresholds, and investigate whether such responses reflect changes in reporting/evasion or real business behaviours.
- Finally, we will examine issues related to international corporate tax competition, including the effects of special corporate tax regimes.
- Each of these research areas builds on the analytical work that we will be undertaking in partnership with the Governments of Ghana and Ethiopia, or is of direct policy relevance to these and other low and middle income countries.

Contents

Introduction

The ultimate purpose of any tax system is to raise revenues to fund government expenditure on public services and investments. But tax policy is about much more than deciding how much revenue to raise. An effective tax policy is one that raises enough to fund the desired level of public spending, while causing the fewest harmful distortions to the economy, and distributing the burden of funding that spending across society in the way that is deemed fairest. That is, a good tax system is both economically (as well as administratively) efficient and equitable.

All countries face challenges in designing and operating such an effective system of taxation. But these challenges are particularly acute in low and middle income countries, where the pressing need to raise revenue for increased investment in public services and infrastructure can be complicated by three important considerations. First, the desire to protect poorer citizens – in this case, often very poor – from further impoverishment due to taxation. Second, the pressure to maintain a competitive tax environment, particularly in relation to foreign direct investment. And third, weak administration and enforcement capabilities, in part due to the scale of the hard-to-tax informal sector.

Recent years have seen a growing academic and policy interest in the design and effects of tax policy in low and middle income countries. At the core of this is work examining how the particular features of such countries affect their ability to administer and enforce taxes and the effects of differences in enforcement-capabilities on the trade-offs between different forms of taxation (Gordon and Li, 2009; Best et al., 2015). Another growing strand of work examines the redistributive effects of tax, transfer and public expenditure systems in low and middle income countries.[1]

There is a real need to review this growing evidence and draw out the implications for policymakers. There is also a need to generate new evidence on a number of practical issues facing tax policymakers and administrators in low and middle income countries, where empirical evidence is still sparse.

[1] See, in particular, the Commitment to Equity (CEQ) initiative: http://www.commitmentoequity.org/.

The IFS's new Centre for Tax Analysis in Developing Countries (TAXDEV), established in 2016, will undertake a programme of research which aims to respond to these needs and address fundamental issues relating to tax in low and middle income countries. The IFS has been at the forefront of the quantitative analysis of UK tax and benefit policy for over 40 years, and it is hoped that this new Centre will create synergies between IFS's UK-focused work and our programme of work in low and middle income countries. TAXDEV's research will draw on the empirical evidence from analysis in our partner countries – Ghana and Ethiopia - as well as theoretical and empirical evidence from elsewhere, to further develop the evidence base, providing valuable insights for academics, policymakers and practitioners.

This document outlines the four areas of research that will inform TAXDEV's cross-cutting agenda.

Firstly, we will examine the efficacy of reduced rates of VAT and VAT exemptions on poor households, by contrasting the costs and distributional effects with other, more targeted, forms of redistribution, such as the increasing number of cash transfer or near-cash transfers being paid out. As countries seek both to raise more revenue and do more to help poorer households, this research will help them understand the extent to which moves from broad tax expenditures to targeted transfers can help them achieve this goal. This work will also examine whether differences in VAT rates across goods and services can be rationalised not for redistribution per se, but to minimise the efficiency costs of taxation, if certain goods and services are more prone to tax evasion or home production.

The other three areas explore issues which are related to the design and operation of tax regimes for businesses. Each relates to an area where policymakers face difficult trade-offs between applying the 'general' tax system to the broadest number of taxpayers possible, and the risk that doing so discourages business growth or investment, whether due to the compliance costs imposed (particularly relevant for small businesses) or tax competition with other jurisdictions (particularly relevant for multinational businesses).

We plan to investigate the effect of VAT on firms' compliance with the tax system and on their production decisions, contrasting it with the effect of simplified tax systems. Thus, we will generate evidence on the costs and

benefits of operating simplified tax schemes for small firms, and of setting relatively high VAT thresholds. We will also generate evidence on the tax gap, and on the efficiency of tax audits at different parts of the production chain. This work is of relevance to many low and middle income countries such as Ghana and Ethiopia, where turnover or flat-rate taxes are used to simplify compliance but still raise revenues from huge numbers of small firms and traders. We will use a unique dataset from India to conduct this analysis.

We will also examine more generally the responses of firms to tax policy and administration thresholds in Ghana, Ethiopia and other low and middle income countries. In particular we will estimate the extent to which firms bunch just below such thresholds, and explore whether such responses reflect changes in reporting/evasion or real business behaviours. An understanding of this will help policymakers decide at which level to set tax thresholds, and better target their audits at firms reporting turnovers and profits that indicate they may be misreporting in an attempt to evade taxation.

Finally, we will explore issues related to international corporate tax competition, including the effects of special corporate tax regimes. Many low and middle income countries, including Ghana and Ethiopia, operate special incentive schemes for particular sectors or geographic areas, in the hope of influencing the type and scale of investments. But are such schemes worthwhile, or do they simply reduce revenues or require higher taxes on other sectors or regions to compensate? We also plan to examine how the evolving international tax regime and ideas for reform – including those set out in the Base Erosion and Profit Shifting (BEPS) Project, as well as more radical reforms such as formula apportionment – may affect low and middle income countries.

Each of these research areas builds on the demand-led work that we will be undertaking in our specific countries of focus, Ghana and Ethiopia, or is of direct policy relevance to these and other similar countries. The first two research areas are currently at an advanced stage of development, and we are in the process of determining the feasibility of research areas three and four. We propose in each case that the first output will be a review of existing evidence, followed by new empirical analysis. Outputs will consist of academic working papers (and eventually submissions to peer-

reviewed journals), but also shorter and more accessible policy briefing notes, both of which will be disseminated internationally.

1. Indirect Tax Structure, Redistribution and Efficiency

Summary

In this area of research we aim to:

- Draw together new and existing findings on the efficacy of VAT exemptions and reduced (including zero) rates of VAT for redistribution in low and middle income countries;
- Quantify the distributional effects of such exemptions and reduced rates in a number of low and middle income countries, including Ghana and Ethiopia, and compare these to existing and potential cash and near-cash transfer programmes;
- Consider also the efficiency case for exemptions or reduced rates by examining the extent to which tax evasion and the responsiveness of tax evasion to tax rates differs across goods/service categories.

This research addresses a key policy issue for many low and middle income countries: how can fiscal space be created for spending on health, education and productive investments, without adversely affecting the welfare of poorer households. It also seeks to investigate whether taxing goods typically subject to exemptions or reduced or zero rates (such as food) may be problematic due to a particular propensity for such goods to be traded informally.

Introduction and related literature

The key function of any tax system is to raise revenue to fund government expenditure on public services and investments. However, to avoid unnecessary hardship and economic distortion, it is important that these revenues are raised in an equitable and economically and administratively efficient way (Mirrlees et al, 2011).

Largely with equity in mind, many low, middle and high income countries have exemptions or reduced or zero rates of VAT (or sales tax) on goods like basic foods, on which the poor spend a larger fraction of their expenditure. In doing so, the relative burden of VAT on poorer households is reduced by more than for richer households. However, given richer households tend to spend more on food and other 'necessities' in absolute terms, such redistribution is poorly targeted. The question is thus: are

there better ways available to channel resources to poorer households than poorly targeted tax expenditures?

In high income countries, the answer is almost certainly 'Yes'. Well-developed social protection systems with targeted cash transfer schemes for poor households mean one can redistribute much more effectively than via VAT (Mirrlees et al, 2011; CPB et al, 2013). Low and middle income countries have traditionally lacked such targeted transfer systems, however. This has led a number of influential public finance and development economists to argue that reduced rates and exemptions have an important role to play in developing country VAT policy (see for example Bird and Gendron, 2007; Bird and Zolt, 2008). In contrast, other authors emphasise the role a broad simple VAT can have in increasing the administrative and economic efficiency of tax collection, and in raising the revenues that allow the development of social protection programmes that can better redistribute (Ahmad and Best, 2012; Anton et al, 2012; Ebrill et al, 2001). Indeed, with an increasing number of countries introducing cash and near-cash transfers to poorer households, there may already be an opportunity to raise more revenues and more effectively transfer resources to poor households by levying a broader-based VAT and expanding the scale and scope of these existing transfers.

Redistribution is not the only reason that policymakers may favour different rates of VAT on different goods and services, however. If consumers respond more to tax on some goods and services by (a) working less, (b) producing more at home to avoid market purchases, and/or (c) shifting to informal traders who do not comply with their tax obligations, then one may want lower rates of tax on these items (Atkinson and Stiglitz, 1974; Kleven et al, 2000). On the other hand, inappropriate differentiation in VAT rates across goods simply distorts consumption (and potentially production) decisions, and adds to administrative and enforcement burdens.

Despite these weighty issues, there is relatively limited empirical evidence on the effects of VAT rate differentiation on either redistribution or efficiency in developing countries. This research would seek to address that gap.

Data, methods and analysis

The specific work in this area of research can be broken into two stages.

The first stage is to analyse the distributional effects and revenue costs of preferential rates of VAT using simple micro-simulation techniques. As part of our in-country work in Ghana and Ethiopia, we will build tax micro-simulation models. To build these models we will utilise household survey data (which has detailed information on demographics, household expenditures and cash transfer receipts) and information on tax and transfer rates and rules. Among other things, these models will therefore allow for the assessment of the distributional effects of existing and counterfactual systems of VAT rate structures, and existing and counterfactual transfer programmes. Ghana and Ethiopia will therefore provide the two main case studies for our analysis.

We will also seek to expand our analysis to include a broader range of low and middle income countries. Existing IFS work has examined the effects of reduced rates of VAT in Mexico (Abramovsky et al, 2011) and El Salvador (Abramovsky et al, 2012). Although these countries are at different stages of development to Ghana, Ethiopia and other DFID priority countries, this analysis can provide useful information about how redistributive capabilities may change as countries develop. There are different options for how we could implement the expansion of the analysis to include other countries. Firstly, IFS TAXDEV researchers could develop models of taxes and transfers for these countries using downloadable household survey data and publicly available information on tax and transfer rules. A more promising approach, however, might be to collaborate with researchers in Tulane University's Commitment to Equity project which maps the distributional effects of existing tax and public spending systems in a range of mainly low income countries.[2] This programme seeks to examine the distributional effects of the system as a whole, or major components (like VAT), rather than the specific structures of these components (like VAT exemptions or reduced rates). By collaborating with this programme and extending their models to look at the effects of VAT rate structures, we would reduce duplicated efforts, allowing more countries to be covered.

[2] See: http://www.commitmentoequity.org/. We have already established links with leading researchers at the CEQ project.

The second stage of this work is to assess the efficiency case for preferential rates of VAT, and in particular, whether differential propensities for tax evasion across different goods and services are empirically important. A full analysis of this means estimating the extent to which VAT evasion rates for different goods and services responds to tax rates. To do this, we will need detailed data on expenditures that includes indicators (or at least proxies) of whether the vendor was tax compliant, and variation in tax rates across goods and services that can be considered plausibly exogenous. Differences in how the rates of evasion across goods and services respond to tax rate changes could then be estimated.

Exogenous variation is, however, difficult to find. Perhaps the most promising strategy is to use data from countries where there is sub-national variation in VAT or sales taxes, such as India or Brazil. This would be a viable source of identification if changes in the tax rates for different goods and services at the sub-national level are unrelated to other changes in the environment at the sub-national level that could be correlated with tax evasion (such as differential rates of economic or institutional development). It will be necessary to analyse the survey data and tax systems of suitable countries to determine whether we think this identification strategy is feasible. It is important to note that if it is, the findings will be of broader relevance than the specific country in question: India, in particular, is characterised by a large informal retail sector that has much in common with other low and lower middle income countries. If differential evasion is significant in Brazil, where larger retailers play an increasingly prominent role, it is highly likely to be so in less developed countries too.

If it is decided that the available policy variation and data are not suitable for estimating the responsiveness of tax evasion to tax rates, we can also use scenarios to test the sensitivity of optimal VAT rate structures to assumptions about differential responsiveness of tax evasion to tax rates across goods and services. This will, for instance, allow us to examine the size of any welfare/efficiency costs of applying a uniform rate of VAT on goods and services (for simplicity purposes) when there is differential tax evasion across goods. The findings will be relevant for similar countries not covered directly in the analysis.

Lessons for policymakers

This research will provide evidence on the following key issues for tax policymakers:

- The cost and distributional effects of preferential rates of VAT (or sales tax) in a range of low and middle income countries. Related to this, how much fiscal space could be generated if, instead, transfers were used to redistribute spending power to poorer households;
- Estimates or simulation results on how important differential tax evasion propensities across goods may be for setting VAT (or sales tax) rates.

2. VAT and Simplified Tax Schemes: Production, Trading and Compliance Effects

Summary

In this area of research we aim to:

- Investigate how the Value-Added-Tax (VAT) affects firms' compliance and production decisions in low and middle income economies;
- Examine how the tax system affects the overall efficiency of the economy through production networks, in particular by distorting the quantity and quality of supplier-buyer matches;
- Assess the impact of a tax reform that lowered compliance costs on both tax revenues and the efficiency of the tax system. Similar tax reforms have been considered by the Governments of Ghana and Ethiopia.

The specific research project is characterised by three key features:

- It is demand driven: it results from a collaboration between the West Bengal tax authorities (Directorate of Commercial Taxes), the Centre for Training and Research in Public Finance and Policy (CTRPFP) in Kolkata, and the Institute for Fiscal Studies. It also relates to an economic context and set of policy issues of direct relevance to the Governments of Ghana and Ethiopia;
- It will leverage data from several high quality sources. We will use a novel administrative dataset which contains the VAT returns of more than 200,000 firms in West Bengal over 6 years, allowing us to map all supplier-buyer relationships amongst tax-registered firms. This will be analysed together with firm level surveys that are available for India over our period of study and contain information on both tax-registered and non-registered firms. Access to this unique combination of datasets will provide the opportunity to study this important issue robustly.
- It will provide an evaluation of the impact of a key tax reform of direct interest to the policy stakeholders, and will more generally document the costs and benefits of VAT in the many low income countries characterised by low compliance environments.

The context for this analysis (weak enforcement and substantial non-compliance; relatively high compulsory VAT threshold; simplified schemes for small businesses) and issues in question (production efficiency, revenue collection) are relevant in a wide range of low and middle income countries, including, for instance, Ghana. Indeed, interest in similar issues has been communicated by our partners at Ghana's Tax Policy Unit.

Introduction and related literature

The evidence from this project will shed light on the trade-offs associated with taxing firms in a lower middle income country context characterised by low tax compliance. We will: (a) estimate the extent to which the VAT system affects firms' individual decisions, and its effect on the entire structure and efficiency of production networks, and hence economic growth; and (b) provide some evidence of the impact on both tax revenues and economic efficiency of a reform aiming to decrease the compliance costs of firms. This will enable us to characterise the optimal tax system and hence inform future reforms aimed at boosting tax compliance and growth.

This project will contribute to the fast-growing body of evidence on public finance in low income countries by considering how the tax system shapes the production and evasion decisions of private agents in this context. Recent work by Best et al (2015) shows that the two objectives of revenue and production efficiency may conflict in the high-evasion environments of low income countries. Like theirs, our project considers the taxation of firms and leverages the incentives created by a dual tax scheme. They however consider a system in which firms have to pay either a turnover tax or a profit tax depending on their reported profitability. In our case firms have a choice between paying a value-added-tax (VAT) or a turnover tax if their turnover is below a particular threshold.

VAT is often described in the policy literature as a superior tax system in terms of both revenue and production efficiency (Ebrill, 2001; Keen, 2009). It is thought to be a tax particularly suited for low income countries as it provides governments with information on transactions from two sources, enhancing their capacity to spot under-reporting of tax liabilities. It also links firms' decisions to comply with taxes along the supply chain, potentially leading to 'formality multiplier effects' in which one firm's decision to register with the tax authorities leads to its suppliers and clients also choosing to register. This theoretical advantage has been

influential in shaping tax design; the number of low and middle income countries which have adopted a VAT has increased from 5 in the early 1970s to 86 today (Gadenne, 2012). There is, however, strikingly little research on the way the VAT shapes firms' incentives to comply with the tax system and its impact on the overall efficiency of production networks. Two exceptions are Pomeranz (2015), who provides evidence that the VAT paper trail does improve tax compliance in Chile, and De Paula and Scheinkman (2010), who show theoretically that a VAT system affects firms' choices of trading partners, giving (in)formal firms incentives to trade only with other (in)formal firms.

We will go one step further by considering how, by linking firms' decisions along the supply chain, VAT systems affect the overall efficiency of an economy's production network. The tax system incentivises tax (non) compliant firms to trade with other tax (non) compliant firms. This may, under some conditions, improve the overall revenue efficiency of the tax system but worsens the economic efficiency of production networks, by distorting the supplier-buyer matches.

This project is therefore also related to the growing trade and macroeconomic literature on firm networks (Acemoglu et al, 2012; Oberfield, 2013), which focuses on how shocks in one part of the supply chain affect the entire network (see for example Carvalho, 2014) or on the role of search costs in determining the efficiency of the matches between suppliers and clients (Bernard et al, 2015).

To the best of our knowledge our project will be the first to use data on the complete network of (tax-registered) firms outside of a high income country context. By mapping the entire production network this project will build on the literature on public finance in low income countries by demonstrating how changes in the tax system affect both firms' evasion and production incentives and the shape of the network, i.e. the quantity and quality of the supplier-buyer matches. We will also provide new evidence regarding the structure of the network, of interest to the trade and macro literatures.

The tax system in place in the study context (the combination of a turnover tax and a VAT described below), high levels of informality and the prevalence of firms outside the tax net, as well as the type of reform we will study, are very representative of tax systems and reforms in many low income countries; the findings will, therefore, be of direct relevance to the

tax and growth policies of countries in South-East Asia and Sub-Saharan Africa.

Context

West Bengal is an Indian state with 90 million inhabitants, in charge of setting and levying taxes on the sale of non-agricultural commodities with the VAT. Like most VAT systems, West Bengal's is a 'dual' VAT system: firms whose turnover is above a threshold have to pay the VAT but smaller firms may choose between paying the VAT and paying a 0.25% tax on turnover. Firms which opt for the turnover scheme cannot issue tax receipts for their sales, so VAT-paying firms cannot deduct purchases from firms under the turnover scheme from their tax liability. This implies that firms opting for the turnover scheme, though tax compliant, are 'VAT-informal': informal from the point of view of firms in the VAT scheme. Our data will enable us to observe the behaviour of firms in both schemes and the transactions between them. This 'dual VAT scheme' is common throughout the world, and similar systems exist in Ghana and Ethiopia. The main rationale for allowing smaller firms to opt for the turnover scheme is to exempt them from the high compliance cost of filing for VAT, which may be particularly large in low and middle income countries where tax literacy is lower.

Our data sharing agreement with West Bengal gives us access to all the tax returns of all firms paying taxes under either the VAT or the turnover scheme in West Bengal in the fiscal years 2010-2011 to 2014-2015. At the firm-level, this data includes the list of all purchases and sales to other firms, with the tax id number of the client/supplier when the client/supplier is registered with the tax authority. This enables us to observe all transactions between firms registered with the tax authority. In addition, we have access to firms' registration information (firm type, location, and age), types of commodities sold, and information on which firms were audited by the Directorate of Commercial Taxes.

In 2013 the government implemented a tax reform which substantially lowered the cost of paying the turnover tax. Small firms can now opt for greatly simplified forms of tax registration and returns and pay lump-sum tax payments (two lump-sum values depending on a firm's turnover, a form of 'presumptive tax' common in low income countries).

Finally, a great advantage of working with West Bengal is the existence of excellent quality firm surveys for India. The Annual Survey of Industries

(ASI) covers medium and large firms (nearly 3000 firms for West Bengal) and the quinquennial NSS survey of unorganised enterprises is designed to survey small firms and self-employed individuals not covered by the ASI. The latest round of this survey covers our first year of study (2010-2011), the next round is currently being collected and will cover the year 2015-2016, our final year of study.

Armed with these datasets and policy variations, we will work on two (related) projects.

Data, methods and analysis

Project 1: Supply networks and tax design

This project will: (a) describe the production network of firms in the economy; (b) provide evidence on the extent to which the tax system affects firms' choice of trading partners and hence the efficiency of the economy, and; (c) identify how a compliance shock to one firm (such as an audit) affects other firms in its networks.

The richness of our data and its scope allows us to first provide a detailed picture of production networks in a lower-middle income country. We will start with detailed descriptive statistics on these networks, using recent developments in the methodology of network analysis (Jackson 2008). There are several questions of interest which descriptive statistics will inform, in particular: how segmented are supply networks – do we see that firms choose to trade mostly with others with the same tax status, holding firm production, type and size constant, and how does this compare with the role of, for example, distance between two firms? Moreover, with five years of data we will shed light on the dynamics of these networks. In particular, we will look at the impact of quasi-randomly allocated tax audits of firms on those firms' clients and suppliers: do we see that they adjust their tax payments in response?

We will also be able to shed some light on what is generally thought to be an important limitation to the use of administrative tax data in low income countries – the fact that these datasets typically cover a highly selected group of tax-registered agents and excludes the bulk of the economy, thought to be in the informal sector. Combining the NSS and ASI data we will describe the distribution of firms by type, size and location in West Bengal and compare this with the distributions in the administrative data. This will tell us what share of the overall economy is covered by the tax

system, and inform the selection process of firms into the formal sector. The comparison of the survey and administrative datasets will moreover allow us to estimate the 'tax gap' – between potential and collected tax revenues - and its distribution across industries, geographical areas and firm sizes. This distribution is of particular interest to the West Bengal Authorities.

Second, we will leverage the incentives created by the tax system to estimate key parameters that determine the efficiency of the tax system. We will set-up a theoretical framework to understand how firms' production, evasion and trading (choice of suppliers/clients) decisions are affected by tax policy and guide the empirical analysis. The model will consist of firms operating on several production stages, trading with each other and choosing how much to produce, whether to pay taxes (and enter the formal economy) and how much tax to pay, extending De Paula and Scheinkman (2010) to allow for heterogeneous quality in the matches between suppliers and clients, in the spirit of the trade/macro network literature (see Oberfield, 2013; Bernard et al, 2015). Firms will be able to remain informal and hidden to the tax authorities by using low levels of capital, and small formal firms will be allowed to choose between a turnover tax and the VAT.

The VAT and turnover tax schedules provides firms with strong incentives to locate themselves at some points in the distribution of their turnover to value-added ratio: by studying the extra mass at these points in the distribution we will identify the tax elasticities of output (formally, the tax system creates both a kink and a large notch – see Kleven, 2016 for more detail on that methodology). Crucially, bunching analysis will allow us to identify separately real and evasion elasticities - two elements which determine both the optimal tax structure and the welfare impact of tax reform – as well as pin down the role played by the VAT in linking firms' decisions in the network by considering how bunching varies for firms in different parts of the supply chain.

Project 2: Impact of the 2013 tax reform

The second project will focus on the impact of the 2013 tax reform on both revenue and economic efficiency. The reform lowered the cost of complying with taxes under the turnover scheme for small firms; its stated aim (and plausible impact, according to the Directorate's staff) was to increase the number of firms registered with the tax authorities, and hence

increase tax revenues. However, by lowering the compliance cost of choosing the turnover scheme for all firms the reform also led to some firms moving from the VAT scheme to the turnover scheme. This has both a direct effect on revenues (as firms' tax liabilities change) and an indirect effect, by changing the tax liabilities and evasion incentives of the firms' trading partners. By increasing the number of firms opting for the turnover scheme the reform also affected the production network and the quality of the supplier-buyer matches – an economic efficiency cost.

We will use the theoretical framework and mapping of the network described above to quantify both the revenue and production impacts of the reform. In its simplest form our identification strategy will rely on a difference in difference framework, in which manufacturers act as a control for non-manufacturers. We will combine this with an analysis of survey data (the ASI and NSS) before and after the reform to i) control for trends in the overall economy ii) consider how the reform changed not just the share of registered firms but also the types and distributions of registered firms compared to informal firms.

Lessons for policymakers

This research will provide the following elements of interest to policymakers:

- The cost and benefits of introducing a simplified tax scheme for small firms. The policy variation available implies that we will document the cost and benefits of two forms of simplified schemes, both of which are widely used in developing countries: a turnover tax (instead of a VAT) and a lump-sum tax payment (presumptive tax);

- The overall 'tax gap' - the difference between potential and collected tax revenues - and its distribution across industries, geographical areas and firm sizes. This will help the tax authorities know which types of firms to target in registration campaigns and/or compliance crackdowns;

- The efficiency of tax audits. By tracking the impact of auditing one firm on this firm's clients and suppliers we will be able to estimate the 'fiscal externalities' of audits and identify which types of firms have the highest externalities. This will help audit offices allocate resources across firms more efficiently.

3. Firm Responses to Tax Bases and Threshold Setting

Summary

In this area of research we aim to:

- Analyse how the distributions of business taxpayers' reported turnovers, profits and costs are affected by thresholds at which tax bases, rates or enforcement regimes change, in a range of low and middle income countries;
- Using this, understand the extent to which businesses' real and or reporting/compliance behaviour may be affected by these thresholds, and the revenue and other implications of these changes;
- Understand how such behaviour, and the administration and compliance costs associated with tax collection are affected by the location of business tax thresholds;
- Obtain empirical information on factors helping low and middle income countries better set their tax thresholds and tax regimes for small businesses;
- Investigate how the behavioural responses and administrative costs associated with a threshold vary according to business type, industrial sector and other characteristics of the business.

Although the setting of thresholds is a fundamental element of tax policy design and has been examined theoretically, there is very little empirical evidence that policymakers in low and middle income countries can use to guide decision-making in this area.

Introduction and Related Literature

Efficient and equitable taxation of businesses is a vital pillar of any strong fiscal system. Well-designed policies seek to achieve multiple objectives: cost-efficient revenue collection for the government; low compliance costs for firms; minimal distortions to firms' investment and growth; and a fair distribution of taxes across firms. These objectives are constrained by the specific economic and institutional environments that tax administrations face. In many low and middle income countries, including Ethiopia and Ghana, there are particular issues with respect to the taxation of small

businesses, which represent a very large fraction of all businesses (Hsieh & Klenow, 2014) and provide a large share of overall employment. In order to avoid high compliance and administrative burdens, small businesses often face simplified 'presumptive' turnover- or flat-fee (stamp) based taxes rather than standard income or value added taxes. Only as firms' turnover or profits increase do they become subject to VAT and income tax. Thus as businesses grow, they are subject to different tax systems and enforcement regimes.

In light of this, there is a need to better understand the effects that different tax bases, thresholds and enforcement regimes have on firms' real and compliance behaviour. Understanding these impacts is key to determining the best tax bases for different groups of firms, and the setting of thresholds where tax bases and enforcement regimes change. This strand of our research will contribute to increased knowledge in this area, and in doing so extend two specific literatures on tax system design in the context of low and middle income countries.

The first is a largely theoretical literature examining optimal tax-base threshold setting. The literature highlights the trade-off between the tax revenues that may be lost by raising the threshold against the administrative and compliance costs saved by (respectively) the tax authorities and firms (Keen & Mintz, 2004; Kanbur & Keen, 2014). And, as already discussed, the existence of thresholds where tax payments or compliance burdens change discretely can lead to firms responding by changing their real or reported turnover/income (and other activities) to avoid transitioning into the next tax regime. Each of these factors might differ across firms with different characteristics (for example sector of operation, number of employees, the position in value-added chains), and across districts or countries with more or less well developed tax administration and enforcement capabilities. Therefore, key to operationalising the theoretical models are empirical estimates of these various quantities and responses which, unfortunately, are lacking for low and middle income countries (and, indeed, many high income countries). There is also little theory and empirical evidence to guide the setting of rates below the threshold in achieving the correct trade-off between not being excessively high that they worsen non-compliance, such that firms exit on the extensive margin, but being high enough so as not to discourage transition to a more standard and enforceable regime.

The second literature is more empirical, and examines behavioural response to tax policy and design in low and middle income countries. The majority of these studies suggest that the most significant behavioural responses to taxation relate to reporting and evasion behaviour. This reflects the fact that weak information and enforcement environments create significant opportunities for evasion and misreporting. In the context of Ecuador, Carillo et al (2015) show that the effectiveness of third-party information reporting is significantly limited when firms can make adjustments on margins of the tax returns, which are harder for the tax authority to observe and enforce, such as over-reporting of cost items. Using corporate tax returns from Costa Rica, Bachas and Soto (2015) find that firms which bunch at tax thresholds are significantly more likely to display inconsistencies with third-party reported information, and to adjust revenue upwards following audit threats. They also provide evidence that firms' ease in understating profits by misreporting cost can rationalize the use of broad tax bases which are determined by revenue, instead of profits. Such policies include minimum tax schemes, in which firms are either taxed on profits or turnover according to a specific rule. Best et al. (2015) show that in Pakistan, the existence of turnover taxes as an alternative minimum tax reduces tax evasion by affected firms by up to 70%. Our work will extend this growing literature with work in countries not yet examined (such as Ghana and Ethiopia) and a focus specifically on the implications of estimated responses for the setting of tax-base thresholds, and policy responses to the behavioural effects induced by these thresholds.

Context

Turnover, income or profit-based thresholds for tax policy and administration are a pervasive feature of tax systems in high, middle and low income countries. In Ghana, for example, firms with annual turnovers of less than 20,000 Cedis (£3,600) pay stamp taxes, transitioning to a 3% presumptive tax between 20,000 and 200,000 Cedis (£3,600-£36,000). The VAT threshold is currently set at 200,000 Cedis (£36,000) and has been increased significantly over the last few years to reduce compliance costs for smaller firms and administration costs for the revenue authorities. At 200,000 Cedis, firms also should, in principle, be transferred from the Small Taxpayer Office (STO) system to the Medium Taxpayer Office (MTO) system, where reporting and monitoring are potentially more intensive. A further threshold at 5,000,000 Cedis

(£900,000) is used to select firms for transition to the Large Taxpayer Office (LTO). In Ethiopia between 2002 and 2016, firms had to register for VAT once their turnover reached 500,000 Bir (£16,000), below which a turnover tax of 2% was levied. Businesses also faced different reporting requirements depending on their proprietorship status. In contrast to Ghana, all of the tax parameters in the business tax system, including rates and thresholds, were set in the tax reform of 2002 and were only increased in June 2016. This was necessary after years of inflation and economic growth.

Understanding how these different tax regimes and the thresholds between them affect compliance and administration costs, firm behaviour, and tax revenues is of clear relevance in the context of actual and potential threshold reforms in low and middle income.

Data, methods and analysis

The first stage of this research project will be to compile relevant empirical evidence and theory concerning the determination of tax bases and threshold setting in low and middle income countries. This will allow us to further refine the key questions to be addressed in subsequent research, and will form an important initial output which will be iterated upon as the body of evidence grows during the life of this project.

The second component of this work will draw on detailed empirical analysis in Ethiopia, Ghana, and West Bengal, India to generate new evidence on the effects of different tax bases and thresholds. In particular:

- In Ghana, Ethiopia and West Bengal, we will examine the extent to which taxpayers bunch just below relevant tax thresholds. Such bunching provides evidence about the extent to which firms manipulate their reported income, either through real or evasion responses, in order to avoid the additional tax liability, and/or compliance costs and/or enforcement intensity in the tax regime above the threshold. We will explore the extent to which we can disentangle these effects by looking at differences across sectors more or less able to under-report turnover (for instance, due to contracting largely with government, other firms or consumers), and by making use of business survey as opposed to tax administration data, which may be expected to pick up real but not necessarily reporting responses. In the case of Ghana, some

businesses (such as those owned by someone with multiple businesses, or undertaking certain professional services) cannot make use of simplified schemes – this group may play the valuable role of a control group whose behaviour can be compared to those affected by these schemes and associated thresholds;

- In Ethiopia we will analyse how thresholds and rates in the current tax system affect firms' decision to incorporate. While corporations have faced a stable flat rate of 30%, unincorporated businesses have faced an effective increase in the effective tax rate due to bracket creep. We will compare these different businesses, while trying to keep constant other relevant variables, such as size, sector, and location;

- In Ghana we will conduct a simple analysis of how revenues have changed as VAT thresholds have been raised in recent years, broken down by category and size of firm.

The findings from these analyses will be drawn together to provide new empirical evidence on responses to tax thresholds and tax regimes in a range of low and middle income countries.

Key lessons for policymakers

This research project will provide evidence on the following key issues for tax policymakers:

- If there is evidence of significant evasion/reporting-driven responses to tax thresholds, tax authorities may wish to increase the probability of auditing in firms just below thresholds, or in sectors where firms are particularly prone to bunching below thresholds (which may indicate they are sectors with more opportunities to misreport turnover);

- If there is evidence of real responses (for instance in business surveys), policymakers may wish to ease the transition between tax bases by providing additional targeted support to reduce changes in compliance costs at thresholds. Alternatively, tax rates may be set to avoid too large a jump in tax liabilities at particular thresholds.

4. Business Tax Design in the Context of International Tax Competition

Summary

In this area of research we aim to:

- Examine the costs and benefits of business tax incentive schemes in the context of low and middle income countries;
- Consider more broadly the place of low and middle income countries in an international corporate tax system seeing changes as part of the Base Erosion and Profit Shifting (BEPS) Project, and potentially much larger changes given wider proposals for reform.

The approach taken to analyse these questions will potentially make use of three strategies:

- Cross-country analysis of the effects of tax incentives on investment, profits, employment, exports;
- Detailed analysis of the effect of an individual country's tax incentives system;
- A review of the potential changes to international corporate taxation from the perspective of low and middle income countries.

In empirical analysis, the key difficulty will be the credible identification of policy effects; this is because the setting of tax incentives may endogenously respond to political lobbying from particular industries or firms.

Introduction and related literature

Corporate income taxes are a relatively important source of revenue for many low and middle income countries. Many such countries provide corporate tax (and non-tax) incentives in order to influence the scale, nature and destination of business investments, however. Indeed, such incentives are a key part of many countries' response to the difficult trade-off between raising vital revenues and maintaining an attractive corporate tax environment in a world of increasingly footloose capital. Within sub-Saharan Africa, for instance, the trend has been towards increasing use of tax holidays and tax-free zones: their adoption increased from 40 percent and 0 percent of countries, respectively, in 1980 to 80 percent and 50 percent in 2005 (Keen and Mansour, 2010).

A number of studies have examined the direct financial costs of such tax incentives (as part of broader quantifications of tax expenditures). A full evaluation of the effectiveness of these policies means considering indirect costs and potential benefits too, however. There are advantages and disadvantages associated with tax incentives for specific sectors, regions and investments. Lowering taxes for a specific sector that is particularly responsive to such incentives or is subject to agglomeration or other positive spill over effects might induce additional capital investment and generate wider economic or social benefits (although the most direct effect is to reduce government revenues). Possible disadvantages of incentives policies include the distortion of investment across sectors and the potential for lobbying, corruption and revenue leakages from incorrectly classified investments.

Once one understands both sides of the equation, one can then evaluate a tax incentive by considering whether the lost revenue and indirect costs are more than offset by higher (future) revenue and wider social or economic benefits arising from the incentive-induced behaviour. The G20 Development Working Group (comprising IMF, OECD, UN and World Bank) has recently called for more systematic evaluations to facilitate informed decision making, based on improved data and analytical tools.

What of the empirical evidence on the effectiveness of tax incentives?

Survey evidence collected across many countries show tax incentives rank close to bottom in relative importance for location decisions (UNIDO, 2011). At the same time, the survey evidence suggests that the lack of effectiveness of incentives may be in part due to the absence of wider necessary factors in low and middle income countries, including political stability, macroeconomic uncertainty and enabling infrastructure. Tax incentives may become more pertinent as the more fundamental building blocks for a decent business environment fall into place.

Findings based on firm- or aggregate level data on investment and sales are unfortunately inconclusive. Using a panel of 29 regions between 1985 and 1995, Chen and Kwan (2009) find that special economic zones are systematically associated with increases in foreign direct investment (FDI). Klemm and Van Parys (2012) similarly find, in a panel of 40 Latin American, Caribbean and African countries, that lower corporate income tax rates and longer tax holidays are associated with increases in FDI, but find no changes to total investment nor economic growth, due possibly to a

displacement effect. Based on a firm-level dataset that spans 17 emerging economies over the 2002-2005 period, Gorodnichenko et al. (2013) find positive backward productivity spill overs of FDI on domestic firms, but no effect through horizontal or forward linkages. Theory and evidence does suggest though that different types of incentives may be more or less effective in different contexts, and in attracting different forms of investment. For instance, evidence based on tax reforms in the US suggest that accelerated investment depreciation has been more effective in spurring real investment (House and Shapiro, 2008) than corporate tax rate cuts (Yagan, 2015).

This mixed evidence means that low and middle income countries have little to guide them when developing their corporate tax policies, other than the lobbying of firms and sectors for favourable tax regimes, and recommendations from institutions such as the IMF that such special regimes are best avoided. This research will therefore:

- Review the available evidence of the costs and benefits of corporate tax incentives in a low and middle income country context;
- Undertake new empirical analysis on the effects of such incentives, either using cross-country or detailed in-country data;
- Consider the design of corporate tax systems in low and middle income countries more broadly in the context of the BEPS Project and other mooted changes to the international corporate tax system.

The precise nature and scope of this work is still in development and will be updated in due course.

Lessons for policymakers

The analysis will provide information on the following important policy issue:

- The extent to which costly special tax regimes to attract investment in particular industries or to particular regions are money well spent or money better spent elsewhere (for instance, on broader based tax incentives, or public services and investment);

It will also inform the debate around how low and middle income countries can respond to ongoing changes to international taxation.

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