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How to overcome rent seeking in Tanzania's skills sector? Exploring feasible reforms through discrete choice experiments

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ABSTRACT

Skills gaps and mismatches are widely documented as a hindrance to inclusive structural transformation across developing countries, especially in Africa. What is often overlooked, however, is the fact that skills development is a complex political economy process challenged by institutional and financing problems on the supply side, and inadequate demand, that is, a shortage of firms that can organise skilled labour and provide on-the-job training effectively. In such adverse contexts, rent seeking and corruption may arise from conflicting objectives, trade-offs and mis-aligned incentives among stakeholders – public sector skills providers and firms. With a focus on Tanzania, we (i) analyse the incentive structures underlying such rule-breaking behaviours and processes, and (ii) empirically test alternative institutional design strategies that would better align the interests of different stakeholders towards improved skills development outcomes. Building on over 30 in-depth stakeholder interviews in 2018, we conducted three Discrete Choice Experiments with over 200 firms to test the feasibility of different incentive packages in 2019. Our main hypothesis is that the successful re-alignment of stakeholders' incentives must consider both the different and potentially conflicting objectives of public training institutions and the heterogeneity in skills needs and capabilities of different types of firms. We uncover latent preference structures differentiated by observable firm characteristics, most strongly by differences in technical capabilities, existing training provision and firm size. We conclude advancing an evidence-based tailored skills policy reform.

1. Introduction

Vocational training and skills development are essential components for productivity-enhancing and inclusive structural transformation (McGrath, 2018; McGrath et al., 2020; Bennell, 2022). Productive organisations across all sectors rely on a pool of skilled workers to build up their capabilities and absorb and deploy technologies effectively in production. Yet, the existence of skills gaps and mismatches has been widely documented in several developing countries (Adams, de Silva, & Razmara, 2013; Amsden, 2010; Ansu & Tan, 2012; Eicker, Haseloff, & Lennartz, 2017; Lall, 2001; Ngware, Ochieng, Kiroro, Hungi, & Muchira, 2024; Agarwal and Mani, 2024; Gereffi et al., 2011).

Tanzania is no exception here, and a substantial skills gap has been identified as a key bottleneck for productivity-enhancing structural change and good employment generation, especially among the youths (LO/FTF Council, 2016; Tan, Bashir, & Tanaka, 2016). While high levels of academic education provide youths with higher returns than those available from vocational education, the vocational return can exceed the academic return at lower levels (Kahyarara & Teal, 2008; Attanasio, Guarín, Medina, & Meghir, 2017). Among more recent studies, experimental research has focused on the returns to primary education across different employment activities, finding higher returns in non-farm self-employment activities (Delesalle, 2021).

Most studies and policies addressing the skills gap tend to have a 'supply-side' bias (Amsden, 2010) and a relatively 'linear view' of the skills development process. A growing body of literature has explored interacting dynamics linking supply and demand for skills and has highlighted several reasons why standard vocational education and training (VET) programmes have had limited success in developing countries (Carranza & McKenzie, 2024; McKenzie, 2017). One key explanation offered is that even workers who have access to VET programmes (and manage to develop high-level technical skills) might find it difficult to get the jobs that need their skills due to 'search and matching frictions' in the market (Carranza, Garlick, Orkin, & Rankin,

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2022). The more limited the demand for skills in a country, and with only a few firms offering jobs, the higher these potential mismatches, both at the systemic level and especially for disadvantaged social groups. Despite search frictions, formal vocational training has been found to remain a strong signal to employers in such contexts (Alfonsi, et al., 2020).

Public provision of training and matching schemes, especially sector-specific skills development, have been promoted to address several problems and related market failures. Rationales for public interventions include a standard externality problem – firms might underinvest in training due to the possibility that workers will leave to work for other companies (Brown, Hardy, Mbiti, McCasland, & Salcher, 2024; Caicedo, Espinosa, & Seibold, 2022). However, the risk of limited mobility of workers across sectors and geography, with a negative impact on broader productivity-enhancing structural transformation and the need to promote social mobility and inclusive outcomes have also been considered (Carranza & McKenzie, 2024).

Search and matching frictions play an important role. However, what is often overlooked in the literature is the fact that in most developing countries, skills development is a complex political economy process characterised by conflicting objectives, trade-offs and mis-aligned incentives among stakeholders – public sector skills providers and firms – often resulting in skills development traps. Skills development is challenged by institutional and financing problems on the supply side, often due to lack of resources, and pressures arising from the need to provide different types and levels of skills at the same time (Mkandawire, 2004; Whittaker, Sturgeon, Okita, & Zhu, 2020). Supply-side challenges are intertwined with inadequate demand for skills, that is, the fact that in developing countries there are relatively few firms capable to organise skilled labour effectively, complement formal training with essential experience-based technical skills development, and reward increased productivity with higher salaries. In turn, the lack of a skilled workforce makes it difficult for firms to improve their organisational capabilities and production processes, absorb technologies and increase overall productivity (Amsden, 2010; Andreoni & Chang, 2017; Khan, 2019; Allais, 2020; World Bank, 2020). This configures a vicious cycle which is difficult to break, given the structural and institutional contextual features of most developing countries.

In Tanzania, the productive sector is small and highly fragmented, with a significant 'missing middle' of medium-sized high-productivity companies. This results in disarticulated supply chains, chronic lack of investments and multiple opportunities for rents capture (Gray, 2018). Niches of productive competitiveness are limited to a few domestic conglomerates and foreign companies, while the rest of the productive economy operates in a semi-formal setting (Adams, Collier, & Ndulu, 2017; Andreoni, 2017; Diao, Kweka, & MacMillan, 2018; Cti (Confederation of Tanzania Industries), 2018). In this context, firms are highly heterogenous in terms of the quantity, quality, and degree of specialisation of the skills they need. Specifically, smaller firms that tend to be organisationally less capable have very different skills needs than larger firms that tend to be organisationally more capable. The latter – in general – tend to need more sector and technology-specific skills, have a better understanding of these specific skills gaps, and are relatively more capable in organising, deploying and training their workforce on-the-job (MITI and UNIDO, 2012; Andreoni, 2018). Such differences in skills needs and understanding among firms also mean that they have different interests (and respond to different incentives) when it comes to support skills development in the country and to engage with training institutions. One solution is unlikely to fit all.

Differences in skills requirements between the majority of employers and a minority of strategically important productive organisations is a challenge for the VET sector in Tanzania. In addition to the 'economic challenge' of providing firms with different skills effectively, the Tanzanian government faces the 'social challenge' of rising youth unemployment in an economy where the expansion of the productive sector and labour market is slower than population growth. To address this challenge, highly subsidised VET programmes are used to keep youth out of the labour market for longer than actually needed, to compensate for poor basic education and to provide youth with essential skills for employment in the formal but mostly informal sector. The funding to provide for subsidised VET courses is generated through the Skills Development Levy (SDL). The SDL is a tax payable by employers as a percentage of payroll and is administered by the public VET Authority (VETA).

The SDL has been highly contested in Tanzania since its introduction and featured in several government-business negotiating tables (Andreoni, 2018). Over the years, the private sector has raised concerns about the size of the levy, the usefulness of the subsidised training provided, and misallocation and misuse of the levy by the government. The government, on the other hand, has accused companies of hiring foreign workers without work permits or so-called succession plans, which is a violation of the Non-Citizens Employment Act. The political economy of the SDL has hence caused significant mistrust between the public and the private sector, with evidence of rule bending and breaking behaviour on both sides (Andreoni, 2018). As a result, the skills sector is affected by conflicting dynamics and allegations of resource misallocations (on the public-sector side) and tax avoidance (on the private-sector side), despite a strong joint interest in developing skills between governments and companies. This impasse results in skills deficiency and a low-productivity skills trap.

The aim of this paper is twofold. First, we evaluate the incentive structures that result in the political economy problems highlighted above and that is conducive to rule-breaking behaviour. Second, we empirically test institutional design strategies that would better align the incentives of different private- and public-sector stakeholders and thereby reduce misallocation of resources, increase employers' compliance with tax and labour law, and, eventually, overcome the low-productivity skills trap. We hypothesise that the successful alignment of incentive structures must take into account the different and potential conflicting objectives of skills provision pursued by public-sector stakeholders and must also account for the heterogeneities in skills needs and capabilities of different types of productive organisations in Tanzania.

For the first objective, we rely on over 30 in-depth stakeholder interviews and data obtained from various government sources throughout 2018 and 2019. For the second objective, we conduct three Discrete Choice Experiments (DCEs) complemented by a comprehensive questionnaire of a sample of 209 Tanzanian firms collected in 2019. This approach enables us to uncover latent preference structures (i.e., not directly observable 'wants' which guide agents' behaviour), differentiated by observable firm characteristics. Knowledge about these latent preference structures then enables us to navigate differences across firms and their incentives, so to formulate feasible policy solutions that reflect such incentives and preferences, as well as differences in capabilities to effectively respond to such incentives.

Results confirm substantial heterogeneity in the preferences across firms. Differences arise mainly due to diverging technical capabilities, existing training provision and the size of the organisations. Larger and more technically capable organisations prefer to be involved in the design of the VET curriculum and prefer substantial parts of the SDL to be spent on sector-specific training provision. These organisations are also less concerned about the size of the levy or financial rewards for investing into skills provision, and, in many cases, already engage in skills provision through in-house training. In contrast, smaller and less technologically and organisationally capable organisations prefer a generalist curriculum and subsidised courses to be shorter in duration.

Section 2 outlines the potentially conflicting economic and social objectives pursued by the public sector in skills provision schemes and details the existing incentive structures for both private- and public-sector stakeholders in Tanzania. Section 3 describes our research method, research design and data collection. Section 4 reports on our research findings by firstly summarising information collected about the

extent of skills provision among the firms surveyed and the perceived skills gap, and secondly by reporting the results of the DCEs. Section 5 concludes with a summary of our findings and policy suggestions.

2. The political economy of the Tanzania's skills sector: Conflicting objectives, different skills needs, and rent seeking

The provision of VET schemes in Tanzania is motivated by conflicting objectives, which result in trade-offs and various forms of rule bending and breaking behaviour – i.e. rent seeking.[1] In this section, we carefully review the different objectives and incentive structures underpinning private and public stakeholder behaviour, focusing on VET financing and institutions on the skills supply side first, and on firms demanding skills after. The SDL financing model – the source and allocation of these resources – is central to understand the current misalignment of interests and behaviours between supply and demand. We conclude this analysis with two main hypotheses around ways to realign incentives among different actors.

2.1. The institutional context and financing of VET

VET activities and services in Tanzania are run by around 520 providers and promoted under more than 30 programmes and public–private partnership (PPP) schemes. VET providers include public VET centres, 28 of which are owned by VETA. VETA is both a VET provider and the regulatory body for the entire skills sector. The National Council for Technical Education (NACTE) is responsible for regulating technical education in Tanzania, but, unlike VETA, it does not provide any technical education and training directly.

VETA is funded through the SDL, which, since the fiscal year 2016–17, is charged at 4.5 per cent of the total emoluments paid to all employees per month. Any employer with four or more members of staff must pay the SDL. At 4.5 per cent, Tanzania's SDL is significantly higher than in other countries which collect a levy, such as Kenya and South Africa, and consequently there are worries among private-sector stakeholders that this can create a competitive disadvantage and discourage formal employment.

Tanzania's existing VET centres are extremely heterogeneous with respect to their capacity, training quality, and the type of courses provided. The duration of VET courses is determined by the content of the curriculum and ranges between one and three years for 'long courses' (LCs) including on-the job placements ('field attachments') and from three to nine months for 'short courses' (SCs). LCs offered by VETA-owned centres are heavily subsidised through the SDL. SCs are offered by both VETA-owned and private VET centres and offer VET centres the opportunity to generate income at the local-centre level.[2]

In this paper, we focus on institutional-based VET activities, that is, those conducted in a VETA-owned VET centre or a registered, privately owned VET centre, the largest cluster of VET activities in Tanzania.

The SDL is a significant levy across tax departments in Tanzania, with the total funds collected across small, medium and large taxpayers/employers accounting for 3.26 per cent of total domestic revenue. The SDL is collected by the Tanzania Revenue Authority (TRA) under the VET Act and Income Tax Act to promote skills development in the country. According to the revised VET Act 2006, two thirds of the SDL collected should go to the Treasury, and one third to the VET Fund. The Treasury then allocates parts of the funds to the Ministry of Education, Science and Technology, which in turn transfers the resources to VETA, based on an agreed annual budget.

Since 2016 the Treasury has applied a ceiling of 53 billion TShs on the VETA budgets, in part a response to worries over wasteful expenditure at the level of individual VETA centres, as well as a desire to use part of the SDL for other education-related budget items. Such ceiling remained in place throughout the period of the study. The shift in the allocation process for the levy has resulted in a reduction of resources allocated to VETA centres, which, in turn, has stimulated an expansion in the provision of SCs by VETA-owned VET providers.

While private VET providers charge the full economic cost plus a profit margin for their LCs, VETA centres do not make any margin on LCs. This means that only SCs offer public VET providers an opportunity for internal resource generation, which can be used to increase teachers' salaries. The excessive use of SCs for income-generating purposes is problematic as resources funded by the SDL are used to deliver these courses, and so they potentially compete with LCs over rooms, machinery and teaching staff. Furthermore, teachers are drawn to centres that offer opportunities to deliver SCs, which thus reduces the number of qualified teachers available for the subsidised LCs.

2.2. Different skills needs and different training incentives

Over 97 per cent of the Tanzanian industrial sector comprises small firms with fewer than 10 employees. In the 2013 firm census, the last one conducted, only 1,322 large firms (with 10 + employees) were registered, of which 998 are manufacturing companies (NBS, 2016). These large firms operate in a handful of industries, mainly mining and manufacturing of food products and beverages, and are geographically concentrated in Dar es Salam and Morogoro.

While it is imperative to provide these large firms with a skilled workforce for productivity-enhancing structural transformation to be achievable, the majority of employers have very different skills needs. Hence, the quality and type of skills developed among the workforce do not necessarily meet the requirements of large productive organisations, while at the same time there are very few firms capable of organising and deploying skills effectively.

The current VET system has been designed to satisfy social and economic objectives, some of which – but not all – align with private-sector interests. The social objective arises around high youth unemployment. An estimated 850,000 young people enter the Tanzanian job market annually, but only about 50,000–60,000 formal-sector jobs are created each year. Given the limited absorption capacity of the formal sector, underemployment and informal-sector employment have seen a rising trend (LO/FTF Council, 2016).

The heavily subsidised LCs aim to address this issue of youth unemployment by keeping young people in education for an additional two to three years and by providing skills for both formal- and informal-sector employment. LCs are also used to address other challenges arising from poor quality primary education in the country, especially for the most disadvantaged segments of society. While LCs provide a temporal fix, SCs are often preferred, especially by youth who want to establish their own, mainly informal, businesses (hairdressers, tailors, etc.).

Therefore, SCs have proliferated in Tanzania over recent years, both in response to demand from the private sector, and because of the existing incentive structure mentioned earlier.[3] From the perspective of employers this practice has a bitter taste as many are preferring SCs for the provision of their own training needs over the subsidised LCs for which they then have to pay full fees on top of the SDL.

[1] For a political settlement analysis of corruption and rent seeking in Tanzania see Gray (2015) and Andreoni (2017). Chinsinga et al. (2022) uses a political settlement analysis to explain poverty trends in Tanzania, and three other East African countries.

[2] Fees for LCs range between 60,000–120,000 Tanzanian shillings (TShs) annually for full board. Fees for SCs can easily reach 300,000–600,000 TShs or more.

[3] In 2013 VETA introduced guidelines for income-generating activities (IGA) by VET centres. Despite this important step, however, accountability of such activities remained opaque.

2.3. Rents capture and heterogeneity

The governance of existing VET schemes is made particularly difficult by the fact that private organisations hardly see concrete results from their financial contribution via the SDL. In many cases, this has been imputed to a problem of rents capture.[4] Since mid- and late 2000, companies and their representative bodies – the Association of Tanzania Employers (ATE), Tanzania Private Sector Foundation (TPSF), the Confederation of Tanzania Industries (Cti) and the Chief Executive Officer (CEO) Roundtable – have expressed dissatisfaction with the fact that the SDL is not used for vocational training only. They also reported that employers look at this situation as one of double taxation.

This claim stems from three main facts. First, the SDL is not ring-fenced and tends to disappear in the Education Fund where it complements (and is potentially a substitute for) other central budget allocations for education. Second, companies pay additional costs if they want to access more focused SCs for training, upgrading and/or retraining their existing workers. Finally, employers perceive that VETA graduates are often not ready to work and that the amount of on-the-job training required to compensate for this lack of readiness is an additional cost to employers. At the same time, VET centres complain about the quality of their students when beginning their training and use this to justify the diversion of parts of the SDL to provide basic educational activities; see also Munishi (2016).

Addressing these critical challenges is complicated by the fact that not all firms engage with the skills gap problem and the skills institutions and financing process in the same way. Indeed, there is a heterogeneity problem alongside the problem of rents capture.

In many cases, private organisations hardly see the results of their financial contribution to VETA because firms themselves do not develop the managerial and organisational capabilities needed for them to be able to benefit from the improved skills; see Higuchi, Mhede, and Sonobe (2019) for an experiment on the impacts of management training in Tanzania. This is reflected in the conflicting claims around the SDL over the last decade in Tanzania (ATE (Association of Tanzania Employers), 2011; interviews in 2018 with Cti, TPSF and the CEO Roundtable). Among smaller and less productive enterprises, references to 'soft skills' are often made because employers themselves lack the organisational capabilities to assess the specific types of skills that are required to reach certain products and raise quality standards. This explains why the World Bank (2017) (2017) results do not appear to point to a skills crisis in Tanzania. On the contrary, in key areas such as problem-solving and job-specific skills, most firms reported that their workers reach the required skill levels.[5]

Moreover, while a few larger companies have invested in on-the-job training, the majority expect VET centres to provide ready-made skills. There appears to be widespread lack of awareness that companies/employers in all countries have to provide on-the-job training.[6] This lack of ready-made skills in Tanzania's domestic market has often pushed a number of companies in different directions. Some have lobbied for SCs that can provide more tailored skills training. Other companies have simply ignored regulations on work permits and have employed foreign workers to circumvent the lack of domestic skills.

The fact that private-sector representative organisations have been unable to first, challenge the government with hard evidence on the total amount of SDL collected from employers and second, call the government to account for the funds allocated to VETA, suggests that many employers are concerned that they will expose their own potential lack of SDL compliance in the process.[7] Anecdotal evidence suggests that firms underestimate their total payroll and engage in employment strategies that reduce their payroll to avoid paying the full SDL, with potential implications for increasing formal employment.

While these differences reveal a plurality of interests and attitudes among businesses and can be seen as a problem, they can also be seen as opportunities for feasible change. So far, the debate around reforming the skills sector has been mainly driven by mistrust between government and businesses and the idea that the only solution is a reduction in the SDL. However, while this reduction in the levy might reduce (or shift) the problem of rents capture, it would result in a decline in the provision of VET programmes and their inclusiveness. Instead of implementing a one-size-fits-all solution to rents capture in the skills sector, we explore potential strategies that take into account firms' differences in capabilities and leverage their different incentives.

2.4. Realigning incentives to account for differences: Our hypotheses

Even though both the government and companies have a strong joint interest in developing skills, conflicting dynamics and allegations of resource misallocations, corruption and tax avoidance have prevailed for years. We make two main hypotheses around the existence of latent preferences (and interests) across manufacturing firms in Tanzania which can be leveraged to escape this low-productivity skills trap. Specifically, based on their different preferences and underlying interests, firms will respond to different 'incentive packages'. We call it a 'package' in the sense that each incentive package combines different features of the VET policy – for example its financing or delivery models – to which different firms are expected to react differently based on their characteristics.

We hypothesise that preferences differ by firm characteristics and broadly distinguish between two main types of firms – i.e. 'high capability – more productive' and 'low capability – less productive' firms. This categorisation is based on 6 different firm characteristics which are linked to productivity: size, technical capabilities, demand for skilled labour, human resources or organisational capabilities, and labour intensity of the production process. For each firm in our study, we collect evidence on these characteristics. This allows us to match revealed preferences from the experiment with firms' characteristics.

H1: High capability – more productive (HCMP) firms are willing to pay the SDL in exchange for tangible improvements in the quality of the skills supply coming from VET centres.

The reason for this is that HCMP firms are not concerned about reducing their tax base per se: they are relatively more concerned about getting access to adequate skills domestically, and hence, to see an improvement in the VETA-run system. It is indeed in their interest to have better skills, because these firms know how to deploy them effectively and profit. Such firms can also reward higher skills because they deliver productivity increases.

We expect that these HCMP firms are more willing to commit resources jointly with VETA in exchange for changes in the design of the scheme – for example, more sector-specific and technology-tailored trainings. More specifically, we expect that there are some capable firms that are willing to collaborate with VETA in the design of training, including designing 'long-enough' courses, contributing to on-the-job training and responding positively to ex-post incentives. Based on the

[4] For an estimation of the scale of this problem see Andreoni (2018).

[5] This raises questions over the usefulness of self-assessment to evaluate the existence of a skills gap; e.g. see Tan et al (2016).

[6] Unfortunately, there has been no attempt to estimate the extra on-the-job training that companies have to provide in different sectors in Africa. We have attempted this in our analysis to allow comparison with common practices in other countries and across sectors; see section 4.1.

[7] The failure arises despite data being available and published online by TRA and despite ATE and other private-sector organisations sitting on the VETA Boards with access to financial statements.

positive experience of some VET centres (e.g., Moshi VET[8]), we also assume that there are VET-centres willing to adapt to these changes and that this has not happened so far because the SDL financing mechanism does not allow for such realignment of incentives.

H2: Low capability – less productive (LCLP) firms have a strong preference for a reduction in the SDL and are unwilling to discount relatively higher levies for more co-designed solutions or sector-specific training.

Although relatively less capable firms might have latent preferences that are significant for different skills-related dimensions, we expect that these organisations' main concern is about a reduction in the SDL, stemming from the fact that they cannot really benefit from higher-level skills as they do not know how to deploy them effectively, and they are relatively more cash constrained due to smaller profit margins. This means that these LCLP firms will reveal an incentive package that is always skewed towards a reduction in direct contributions (monetary and in-kind) that has no conditionality attached.

For LCLP firms, an incentive package designed for HCMP firms is not a feasible strategy to reduce rents seeking. If we design the same incentive package for both types of firms, it will result in debasing the SDL, further weakening VET centres and no improvement in collaborations between productive organisations and the centres. The rents that are allegedly captured by the state and used unproductively will simply be shifted towards the private sector with no positive development outcome. First experiences in this direction can be seen in action, in relation to some schemes in which adverse selection has led to crowding-in the 'wrong' type of firm, that is, those with the wrong type of incentives. For example, in some sectors, LCLP firms joined the government promoted on-the-job training pilot schemes (National apprenticeship guidelines, 2017) for the wrong reason, that is, simply to replace their low-skilled workers with unskilled trainees whose minimal salary was subsidised. These companies had no real interest and capability to train the trainees and, indeed, hire them after their training period.

[8] In 2009 the Tanzanian Chamber of Minerals and Energy (TCME) in partnership with its members – African Barrick Gold and Anglo Gold Ashanti initially, later joined by other six sponsors (Sandvik Mining, Kabanga Nickel, Pan African Mining Services, Shanta Mining, Mantra Resources (Uranium One) and Atlas Copco) – and the VETA Moshi campus launched the Integrated Mining Technical Training (IMTT) project. TCME member companies made US $2.4 million available towards the project implementation with a focus on: a) converting/refurbishing some of the existing VETA facilities; b) building a completely new training workshop and several classrooms; c) retooling/upgrading of the existing welding, electrical and motor vehicle mechanic workshops; d) training of trainees (six sent to South Africa to upgrade their skills by attending three-month tailormade 'Train the Trainer' programmes); e) exposing Trainers to higher training standards by undergoing staff development at mines; f) recruiting a project manager from an overseas partner organisation to oversee implementation of the programme; and g) guaranteed maintenance of equipment by TCME. The IMTT initiative started in response to the shortage of skills required by the highly technical mining operations in Tanzania and the increasing salaries that qualified miners were managing to secure with the opening of new mines. The programme provides a three-year training course for students who have successfully passed lower secondary school as a minimum. After a generic four-month skills course in the use of hand and measuring tools, basic machine and drawing, students start on a continuous rotation between theoretical, practical and on-the-job training, which continues until they qualify at the end of the third year. Successful students receive a NACTE level four certificate at the end of the course in their area of specialisation. Five areas are offered: electrical, fitting/fitter mechanics, welding/plater welding, diesel mechanics/heavy moving equipment, and auto electrical. TCME manages implementation of the programme and student scholarships. Companies provide scholarships of US$1,500 for each student, of which US$600 are transferred to VETA Moshi to cover full board and a small salary. The remaining resources are retained by TCME to maintain and upgrade training equipment, to train trainers and to provide training incentives. Since 2013, the programme has increased its student enrolment numbers to 200 annually, and many graduates are in high demand in other sectors as well (Andreoni, 2017).

3. Research design

A prominent tool to uncover latent preference structures among different stakeholder groups is the Discrete Choice Experiment (DCE). This method is widely used in transport and health care studies, but less so in social science. A standard random utility model builds the theoretical foundation for the DCEs (Hole, 2007; Lancsar, Fiebig, & Hole, 2017). Assume that the utility accruing to decision-maker n if choosing alternative j can be described as:

$$U_{nj} = V_{nj} + \varepsilon_{nj} \tag{1}$$

with V_{nj} being a function of observed attributes of the alternative $j(x_{nj})$ and the decision-maker $n(z_n)$ and ε_{nj} being assumed to be random. Then the probability that the decision maker n choses alternative i over j is given as:

$$P_{ni} = P(U_{ni} > U_{nj}) \text{ for all } j \neq i \tag{2}$$

The utility is approximated by a function that is linear in parameters, so that:

$$V_{nj} = x_{nj}'\beta + z_n'\gamma_i \tag{3}$$

A mixed logit model is chosen, due to the possible heterogeneity in preferences in the sample. Mixed logit models account for latent scale and preference heterogeneity by allowing estimated parameters to vary around their mean, so that β in (3) is defined as:

$$\beta_j = \beta + \eta_j \tag{4}$$

with η_j being the random variation around the parameter mean β (Lancsar et al., 2017). The mixed logit model has the additional advantages that it accounts for the panel structure of the DCE data, provides more reliable standard errors and moves away from the proportional substitution assumption that is often violated (Hole, 2007).

In a second step, indices, that capture different dimensions of firms' productive capabilities are constructed by use of principal component analysis (PCA). The indices are then interacted with attribute levels to capture heterogeneity in preferences across observed characteristics, in line with our hypotheses.

It is important to note, that estimation results are indicative of preferences for a set of characteristics that could define policies, however, one cannot infer behavioural changes from these revealed preferences (Brathwaite & Walker, 2018). This means, that once a specific policy is implemented, the uptake and effect of the policy might differ from the revealed preference. However, the aim of the DCEs is to identify policy options that are feasible for and desired by different types of firms and therefore assist the identification and design of potentially effective policy packages.

3.1. Experimental design

DCEs require the identification of relevant attributes (e.g. the size of the skills levy) and attribute levels (e.g. 2.5 %, 3.5 %, 4.5 %, 5.5 %) to construct choice packages relevant for the research objectives. In this study, the identification of attributes has been guided by the research team's knowledge of the Tanzanian skills sector as well as months of semi-structured and unstructured interviews throughout 2018 and 2019 with business organisations, government officials and firm representatives in Tanzania (See Appendix A1 for a complete account of this preliminary analysis).

Three separate DCEs are created that focus on different contested policy elements, namely: (1) the design of the training, (2) the nature of the skills levy, and (3) the design of incentives to firms and VETA for

skills provision. Attributes (in bold with grey background) and attribute levels (bullet points) are summarised in Table 1. The Size attribute is part of all three choice experiments. This allows direct comparison of the preferences identified by estimation of the relative willingness to pay (WTP). Size and Length are coded as continuous variables in the model estimation. Non-linearities are explored by considering quadratic forms of the continuous variables.

We generated a seven-task d-efficient design for each DCE with zero priors. Participants were asked to rank three alternatives in each task. This brings the DCEs to a total of 21 tasks each. The design was motivated by an effort to balance boredom with statistical power and enable participants to take breaks between the DCEs. Entries were dummy coded so that coefficient estimates measure the strength of preference of the attribute level relative to the omitted level of the attribute.

Participants were further asked to rank levels of each attribute before conducting the DCEs. The purpose of the ranking was (i) to give participants the opportunity to familiarise themselves with the different attribute levels that were subsequently used in the DCEs and (ii) to provide a quick sense check on revealed preferences as well as an easy opportunity to gauge firm characteristics across which preferences might differ. Enumerators were advised to probe participants on their understanding of attribute levels during the ranking exercise by asking them to provide reasons for their ranking choice.

The ranking exercise and DCEs were further complemented by a comprehensive questionnaire to identify firm characteristics. The questionnaire was divided into three parts which required completion by different personnel. Part A covered general characteristics of the organisation including location, main activities, and ownership structure. Part B contained the ranking exercise and the DCEs. Part C covered characteristics of the company around: (a) the company's productive capabilities and competitiveness and (b) employment and skills.

Building on our two main hypotheses presented in the previous section, Table 2 summarises the expected revealed interests-incentives scenarios by firm types.

3.2. Sampling strategy and data collection

Tanzania's Annual Survey of Industrial Production 2016/17 was used as sampling frame and was cross-referenced with data collected by REPOA for the *Global Competitiveness Report* and the most recent list of companies registered with the Business Registration and Licencing Authority (BRELA). Firms across 10 manufacturing sectors with more than 20 people engaged, located in six regions in the northeast of the country were selected: Arusha, Dar es Salaam, Iringa, Kilimanjaro, Morogoro and Tanga.[9] This sample was then complemented by several smaller firms located in Dar es Salaam (See Appendix A2 for a complete account of the sampling strategy and data collection).

The six regions combined cover about 82 per cent of total manufacturing value added in Tanzania, and hence the selection provides a cost-efficient way to cover a substantial share of large manufacturing companies in the country (NBS, 2016). The choice of manufacturing sectors was motivated by our aim to cover sectors across different technological classifications; low-tech, medium-tech and high-tech.[10]

A total of 178 large and medium size firms and 38 small firms were reached, resulting in a total sample of 216. Seven of these firms were excluded from the analysis as the missing data share was too large, leaving a sample size of 209 (See Appendix A3 for more detail on data cleaning). In line with our sampling strategy, the largest shares of firms in the sample are from Dar es Salaam (62 %), Arusha (14 %) and

Table 1
DCE attributes and attribute levels.

(1) Training	(2) Levy	(3) Incentives
Size What would be an appropriate size for the skills levy? ● 2.5 % ● 3.5 % ● 4.5 % ● 5.5 %	**Size** What would be an appropriate size for the skills levy? ● 2.5 % ● 3.5 % ● 4.5 % ● 5.5 %	**Size** What would be an appropriate size for the skills levy? ● 2.5 % ● 3.5 % ● 4.5 % ● 5.5 %
Length What should be the length of typical certified training provided by VETA? ● 6 months ● 9 months ● 2 years ● 3 years	**Frequency** With what frequency should the skills levy be payable? ● Monthly ● Quarterly ● Yearly	**Incentives for firms** What would be the most favourable concession against a contribution to skills training? ● Reimbursement of incurred training costs up to 20 % of levy ● Reimbursement of incurred training costs up to 30 % of levy ● 30 % upfront reduction of levy for the first three years of employment of a recent[d] VETA graduate
Content Who should oversee the design of the curriculum of the training? ● VETA in consultation with business associations/chambers of commerce ● Business associations/ chambers of commerce and ratified by VETA ● Newly established sector skills councils[a] and ratified by VETA ● Customised curriculum by individual firms co-developed with VETA	**Allocation** How should the skills levy be allocated and managed? ● Pooled: 1/3 to VETA, 2/3 to National Education Fund ● Pooled: 2/3 to VETA, 1/3 to National Education Fund[b] ● All to VETA: 2/3 for sector-specific training,[c] 1/3 for other types of training ● All to VETA: 1/3 for sector-specific training,[c] 2/3 for other types of training	**Investment** What would you be willing to contribute to the training? ● Investment in training teaching staff, machinery, equipment and facilities ● Providing access to machinery, equipment and facilities in the company ● Joint investment in training teaching staff, machinery, equipment and facilities as part of sectoral council/ chamber of commerce/ business association
Placement What share of work experience should the ideal training have and in what way should the work experience be ensured? • 2/3 theory and 1/3 field placement/ internship • 1/3 theory and 2/3 field placement/dual apprenticeship	**Base** How should the levy be determined? • Levy as a percentage of payroll • Levy as a percentage of profit	**Incentives VETA** In your opinion, which incentive would make VETA centres most responsive to your company's needs and improve the quality of training? • VETA centres retaining the profits from offering SCs at competitive rates • VETA centres receiving a subsidy for providing SCs customised for individual firms • VETA centres receiving a financial reward with each student who gets a full-time job

Notes: a) Sector Skills Councils would be composed of private sector firms, training providers, labour, ministries and relevant regulatory agencies with a strong employer majority to promote public–private sector cooperation.
b) Higher Education Students' Loan Board, NACTE, Ministry of Labour National Apprenticeship and Internship Programmes.
c) Via newly established sector skills councils.
d) VETA graduate who graduated within the last two years.
Source: The authors.

[9] Tanga includes Coast as a newly established region.

[10] As defined by the United Nations Industrial Development Organization (UNIDO); see https://stat.unido.org/content/learning-center/classification-of-manufacturing-sectors-by-technological-intensity-%28isic-revision-4%29.

Table 2
Revealed interests-incentives scenarios.

	Incentive package prioritising quality of VET outcomes	Incentive package prioritising costs of VET scheme
HCMP firms	**Aligned interests-incentives scenario** Main features based on incentive package attributes: Training: Customised and tailored curriculum co-developed with VETA. Levy: SDL used mainly for sector-specific training. Incentives: Coordinated investment in sector-specific training facilities. Incentives: Monetary rewards for VETA centres for quality skills outcomes.	**Misalignment of interests-incentives scenario**
LCLP firms	**Misalignment of interests-incentives scenario**	**Aligned incentives scenario** Main features based on incentive package attributes: Training: Shorter lengths of training Levy: SDL to be based on profits to reduce costs for less profitable firms. Incentives: Reduction in the SDL in return for employment of a recent graduate. Incentives: Subsidising SCs to make them cheaper.

Source: The authors.

Morogoro (11 %); the three regions that rank highest in terms of total manufacturing value addition (NBS, 2016).

4. Research results

Details about employees' skills profile and the amount, type and costs of training provided by employers sampled are summarised in sub-section 4.1. Sub-sections 4.2. and 4.3 summarise the DCE results, first presenting average results and then differentiating by observed firm characteristics.

4.1. The skills gap and training provision

In line with previous reports, English language and IT skills are assessed by employers as being the least adequate across all employee categories (WB 2017; Andreoni, 2018). This is followed by critical thinking and writing skills, and then problem-solving skills. Non-skilled workers are rated the most deficient in all skills categories, while managerial and professional staff skills are rated mostly adequate. In all three employee categories interpersonal, work ethic and job-specific skills are rated the highest; see Fig. 1.

The perceived skills gap varies not only across employee categories but also across the type of firm. Smaller Tanzanian-owned companies are more heavily affected by the perceived skills gap in English and IT. These companies might be unable to attract highly skilled labour or tap into overseas labour markets to satisfy their skills requirements. Interestingly, job-specific skills are particularly highly rated in terms of adequacy for companies with fully automated production processes, possibly indicating the importance of on-the-job training for these firms to operate production technologies.

Fig. 2 supports the conjecture about the varied access of firms to skilled labour due to differences in ownership. While the overall share of foreign workers in the total workforce is small, it is significant for managerial roles and roles requiring education in science, technology, engineering, and mathematics (STEM). A quarter of all STEM positions on average are filled by foreign workers. As expected, the share of foreign workers in all categories is higher for foreign-owned firms or joint ventures, indicating easier access to overseas labour markets.

Asked about where employees gathered relevant work experience before filling their current post, employers indicated that most employees have gained experience within the same company. The relatively higher share of employees recruited internally, 45–55 per cent across employee categories, indicates that trained employees can and are being retained. About 61 per cent of the recently employed VET graduates required additional training and more than 66 per cent of the sampled firms indicated that they provide employees with training.

The training received differs by employee type (see Fig. 3a). Most training is non-certified and is delivered in-house either in the form of shadowing, mentoring and supervised work or in the form of structured but non-certified training programmes. Structured training programmes are used for operative non-skilled workers, while for managerial and professional staff training is mainly received through shadowing, mentoring and supervised work. Interestingly, a substantial share of operative skilled workers receives additional certified training through VETA SCs, the costs of which is covered by the firm.

The objectives of the training provided also differ by employee type. The main purpose for managerial and professional staff is professionalism and soft skills, followed by general productivity-enhancing skills (Fig. 3b). For operative skilled and non-skilled workers, the main purpose is productivity-enhancing skills. For unskilled workers industry-specific knowledge is another important objective. The average duration of training provided ranges between three and four weeks across all employee types. The average costs for training provided are highest for managerial and professional staff.[11] The average training costs if covered internally are substantially higher than costs that are covered externally (Fig. 3c).

Overall, the data suggests that firms make substantial investments into further training for their employees. Further, SCs are in much higher demand than LCs for post-employment training, which explains why firms voice dissatisfaction over the need to invest in further certified training. Yet, with only 66 per cent of the sampled firms reporting that they provide training for their employees, these issues affect some but not all firms.

4.2. Preference structure

The DCEs reveal latent preference structures for sampled firms with respect to: (1) the design of training, (2) the nature of the skills levy, and (3) the design of incentives for firms and VETA for skills provision. Complementing these results with insights from the questionnaire, we can evaluate how these preference structures vary based on observed characteristics, as hypothesised in section 2. For ease of reading the subsequent figures and tables, Appendix B Table 2 provides a glossary of all variable names and their description.

The ranking exercise identifies a consistent preference structure across firms for length of training (two years is preferred), placements (a greater share of work placements is preferred), and size of the levy (unsurprisingly, the lowest option of 2.5 % is preferred). Results are summarised in Fig. 4. As hypothesised, preferences appear to vary with the observed characteristics. For instance, smaller firms and those that mainly rely on manual production processes prefer the SDL to be based on profits rather than payroll and show a strong preference for subsidising SCs. Larger firms and firms that rely more heavily on semi-automatic and fully automatic production processes instead prefer the levy to be based on payroll and VET centres to retain the profits from these SCs or be rewarded for each student who gets a full-time job.

These preference structures are largely confirmed in the DCEs. Results are summarised in Table 3. For the dummy coded attributes, the

[11] High costs are incurred as managerial and professional staff are often sent abroad for specific and highly technical training.

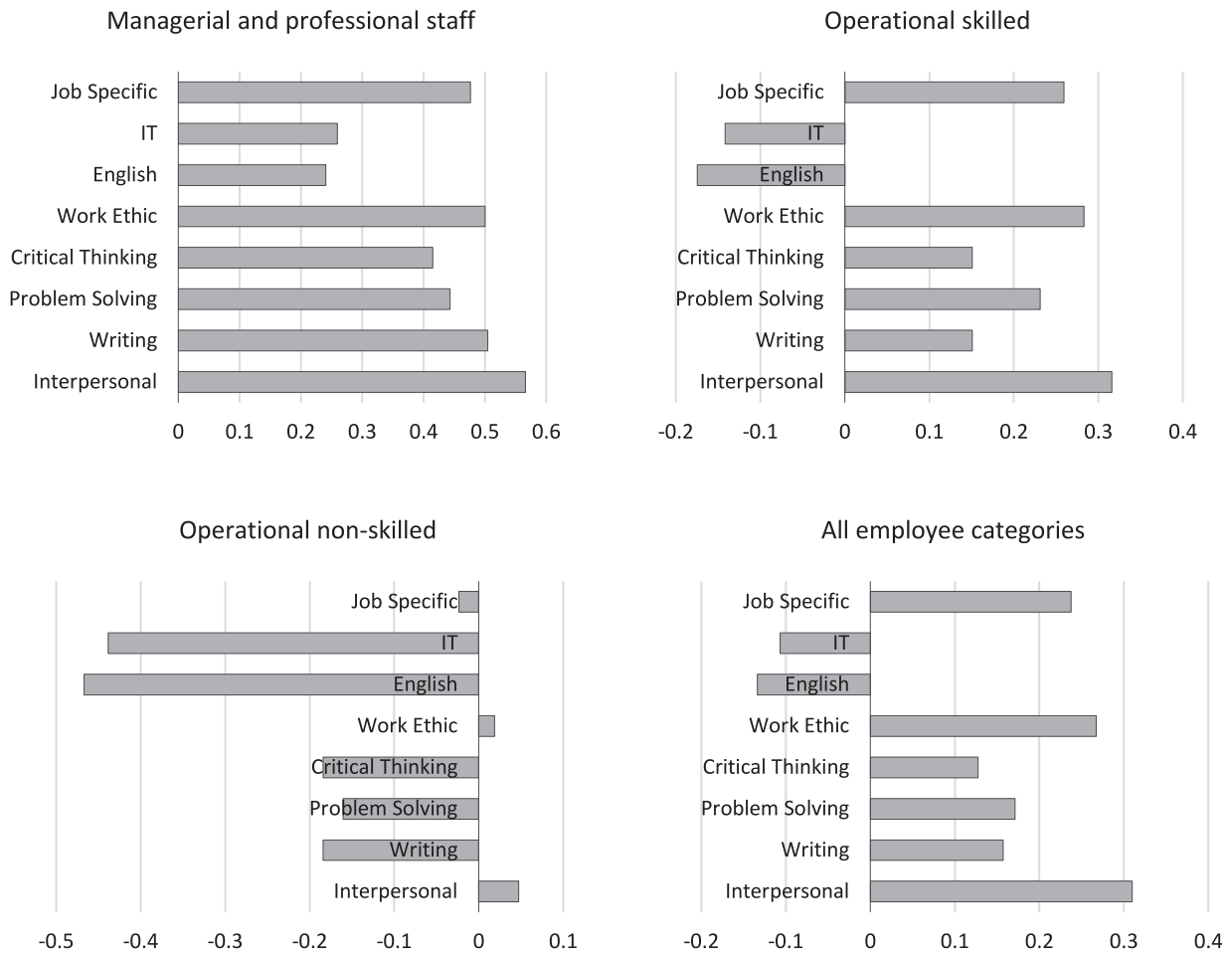

Fig. 1. Perceived skills gap by employee category. Note: Average of assessed adequacy of skills: −1 below required, 0 adequate, 1 above required. A breakdown of the data is provided in Appendix B Table 1.
Source: The authors.

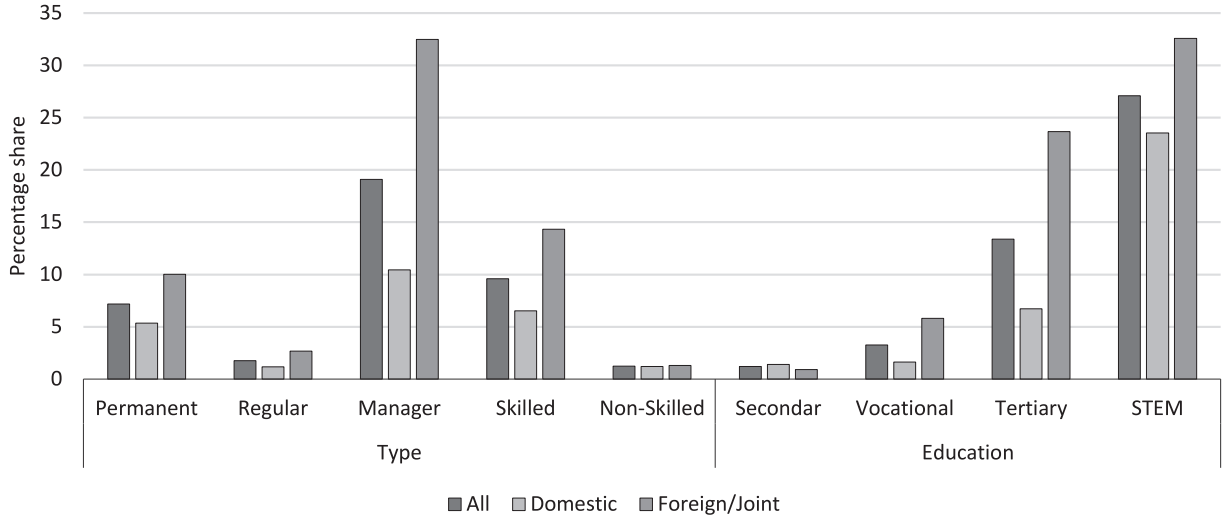

Fig. 2. Share of foreign workers differentiated by employee skills characteristics and ownership.
Source: The authors.

size of the coefficient shows the relative preference for a particular level over the omitted level. A clear preference for a smaller skills levy, as expected, is revealed. The skills levy estimates are strongly significant and consistent throughout all three DCEs, which enables us to derive WTP estimates, making the preference structures comparable across all three experiments (Hole, 2007; Lancsar et al., 2017). The WTP coefficient can be interpreted as the amount in percentage of the SDL that the average firm is willing to sacrifice to gain utility (positive coefficients) or

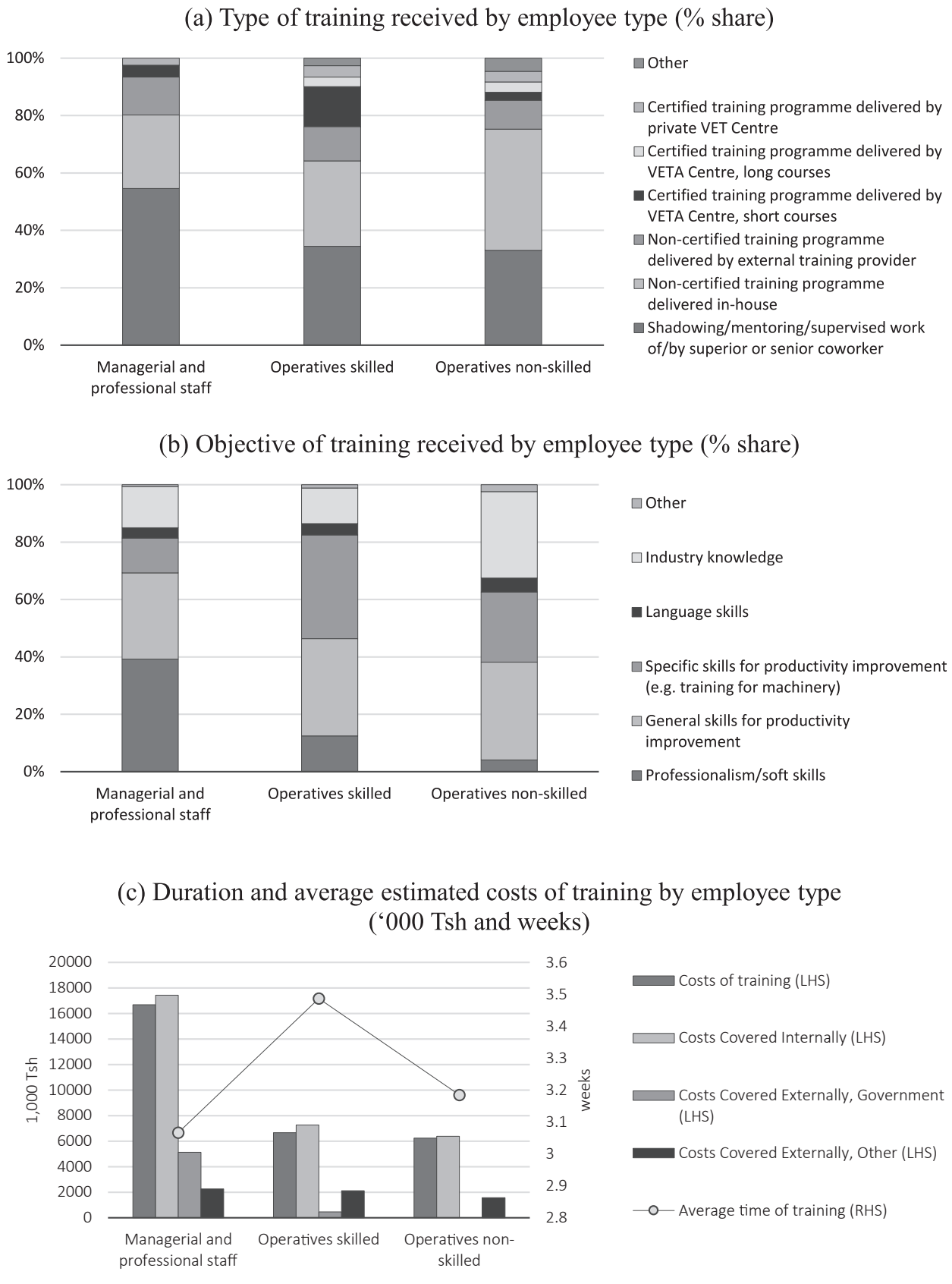

Fig. 3. Type, objective and costs of training provided by employee type.
Source: The authors.

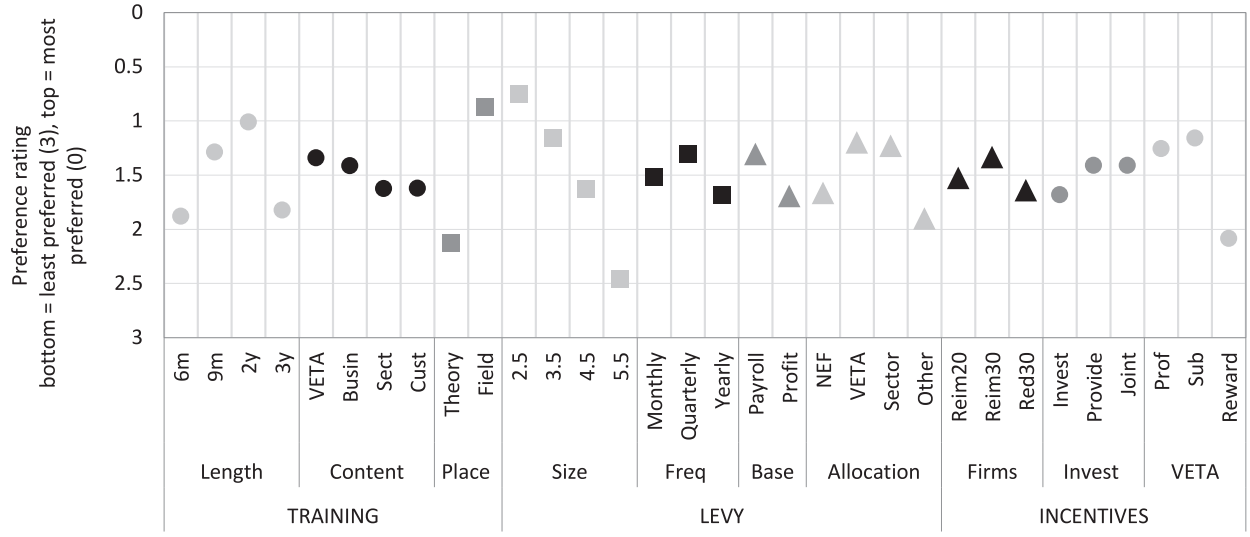

Fig. 4. Average ranking of attribute levels. Note: Rankings are adjusted to scale, ranging from top (first choice) to bottom (last choice).
Source: The authors.

Table 3
DCE estimation results.

Training							
		β	s.e.	η_j	s.e	WTP	s.e.
Size	Continuous	−0.2841***	0.0490				
Length	Continuous	0.0915***	0.0142	0.0426***	0.0073	0.3221***	0.0757
	Squared	−0.0021***	0.0004	−0.0004	0.0004	−0.0075***	0.0017
Content	VETA	−0.0336	0.1189	0.3260**	0.1507	−0.1185	0.4276
	Busin	−0.0872	0.1149	−0.0199	0.1365	−0.3069	0.4298
	Sect	−0.0772	0.1059	0.0769	0.1682	−0.2719	0.3901
Place	Theory	−0.2998***	0.0742	0.4961***	0.1072	−1.0554***	0.2583
Levy							
Size	Continuous	−0.2326***	0.0673				
Freq	Month	−0.1554*	0.0883	0.6939***	0.1120	−0.6678	0.4493
	Quarter	−0.0728	0.1008	0.4036**	0.1712	−0.3130	0.4075
Base	Payroll	0.0060	0.1593	1.0750***	0.1093	0.0258	0.6789
Allocate	NEF	0.0801	0.1258	0.0873	0.3987	0.3443	0.5975
	VETA	−0.0242	0.1189	−0.6099***	0.1266	−0.1040	0.5082
	Sector	0.1214	0.1250	0.3727**	0.1522	0.5219	0.6226
Incentives							
Size	Continuous	−0.2584***	0.0543				
Firms	Reim20	−0.1266	0.0851	0.5625***	0.1078	−0.4900	0.3086
	Reim30	−0.0420	0.0922	0.5622***	0.1314	−0.1626	0.3543
Invest	Invest	−0.0090	0.0716	0.0348	0.1935	−0.0347	0.2773
	Provide	−0.2039**	0.0858	0.4535***	0.1331	−0.7890**	0.3541
VETA	Sub	0.0956	0.0702	0.0303	0.2671	0.3699	0.2784
	Reward	−0.0437	0.0734	0.1238	0.1420	−0.1690	0.2873

Notes: *, **, *** indicating 10%, 5% and 1% significance level, respectively. WTP is the willingness to pay estimate, derived by coefficient estimates over negative of the coefficient for Size. See Table 2 for attribute levels. One level is omitted per attribute, except for the continuous coded attributes, size and length.

avoid disutility (negative coefficients).

Fig. 5 visualises the WTP estimates for all three experiments combined with their respective standard errors. A significant preference for longer training durations with declining marginal utility (maximum utility is reached at 22 months) is revealed. Further, a strong and significant preference for a greater share of work experience over theoretical training and for investment and joint investment in training staff and machinery over providing access to machinery is revealed.[12] Results for the remaining attribute are less pronounced and largely insignificant (see Table 3). Overall, there appears to be a small preference for customised curricula, for annual frequency of payments, for the levy to be allocated to VETA and used primarily for sector-specific training, for an upfront reduction of the levy if employing a recent VETA graduate, and for VETA centres to receive a subsidy to provide SCs customised for

[12] Providing trainees access to machinery is strongly rejected across all firms. Interviews with companies reveal that companies are concerned about the fact that trainees could damage expensive machinery. In this case, the introduction of an insurance scheme to reimburse companies would make them more willing to involve young trainees in in-house practical training at the shop floor level.

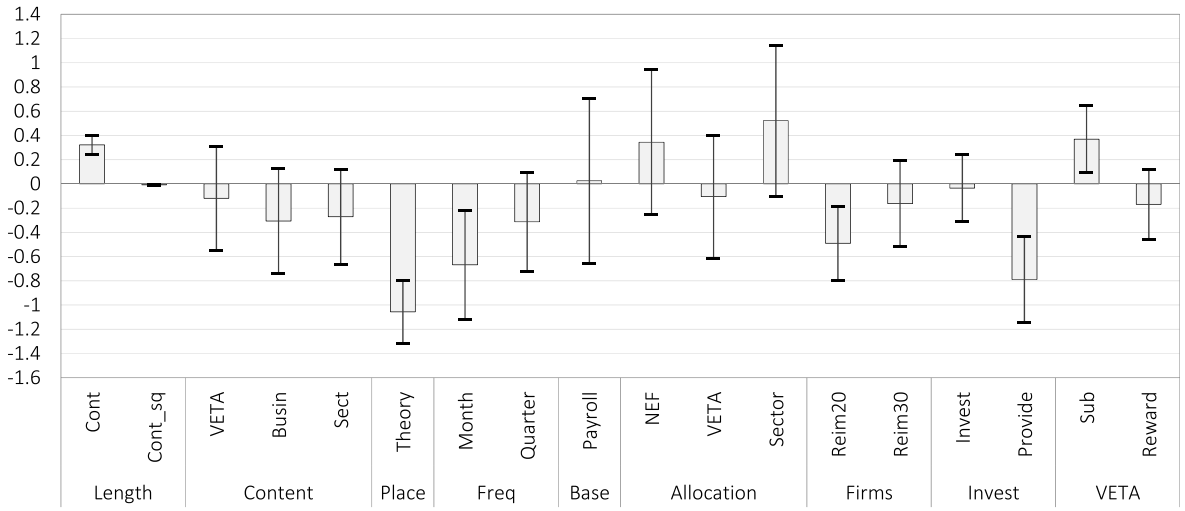

Fig. 5. WTP estimates and their standard errors.
Source: The authors.

individual firms over the alternatives.

4.3. Preference structure by differences in firm characteristics

The results from the mixed logit estimation suggest heterogeneous preferences; see the number of significant η_j estimates in Table 3. Hence, in a second step, we evaluate potential heterogeneities in preferences across observed characteristics. Based on our hypotheses, we construct different measures that capture dimensions of what we term productive capabilities. Specifically, we construct five indices by means of PCA: (i) size, (ii) technical capabilities, (iii) skills demand, (iv) human resources, and (v) labour intensity (See Appendix A4 for further information about the index construction). We expect HCMP firms to be larger, technically more capable, with a higher level of human resources and less labour-intensive production processes (and the reverse for LCLP firms).

These indices are interacted with attribute levels of the three DCEs. Interactions are summarised in Fig. 6. Indices are divided into quartiles with the top and bottom 5 per cent cut to avoid distortions due to outliers. The horizontal line divides the space between utility (top) and disutility (bottom). As before, WTP estimates measure the strength of preference of the attribute level relative to the omitted level of the attribute. Results are reported for each DCE separately. The tiles are organised by attribute (column) and by index (row). Where standard errors include the zero line (dotted), WTP estimates are insignificant. Where WTP estimates are relatively invariant across index quartiles, differences by the observed characteristic are insignificant.

According to Fig. 6, technically capable and large firms have similar preference profiles and so have labour intensive firms and firms faced with a shortage of skilled workers. Some preferences are also universal across firms. Firms agree on a stronger focus on field placements over theory as part of the curriculum and show a strong dislike for the proposal to provide access to machinery and equipment for training purposes. The degree of dislike increases with the sophistication of the machinery. Further, smaller and less technically capable firms show indifference over most attribute levels.

Larger and technically capable firms prefer being reimbursed for incurred training costs, while smaller and technically less capable firms prefer an upfront reduction of the levy for employment of a recent VETA graduate – which suggests that larger and technical capable firms are already engaged in training provision. Large firms and those that rank highly in the human resources index show a strong preference for a customised curriculum co-developed by individual firms and VETA over the alternatives and a preference for most of the SDL to be used for sector specific training. Larger firms also prefer a joint investment in training as part of a sectoral council and VETA centres to provide customised SCs. Less technically capable firms prefer the status quo instead, which is SCs to be offered by VETA centres at a competitive rate.

Lager, more technically capable firms and firms with more labour-intensive production processes show a preference for the levy to be paid annually, while firms that rank highly on the human resource index, have a slight preference for monthly payments. The latter is explained by the group of firms that rank highly on the human resource index being dominated by foreign firms. Monthly payments of the SDL as part of payroll are preferred by foreign firms as this aligns with their bookkeeping, while domestic firms prefer annual payments.[13] Unsurprisingly, labour-intensive firms strongly prefer the SDL to be based on profits, while more technically capable firms prefer the SDL to be based on payroll instead.

Firms with a strong demand for skills and firms with labour intensive production processes have a strong preference for shorter training courses while firms which rank highly on the human resource index prefer longer training courses. Specifically, for firms ranking highest on the human resource index, the preferred duration is 21 months, while for those with the highest skills needs, the preferred duration is 16 months. Firms with a strong demand for skills signal willingness to invest in training resources (but not as part of a sectoral council), prefer to be reimbursed for training costs incurred and show a preference for customised SCs to be offered by VETA centres – which suggest that these firms are already investing in training and would welcome some of the training to be provided by VETA.

In a final stage of analysis, we use training provision as a dummy interaction term to exploit heterogeneities in binary characteristics. Fig. 7 summarises the results. Firms that provide training prefer the SDL to be paid annually, the SDL to be allocated to VETA with the majority being used for sector-specific training, have no dominant preference for firm incentives for skills provision (this is expected, since they provide training regardless),[14] and prefer a joint investment in training and teaching staff as part of a sectoral council. Firms that provide training also show a stronger preference for a focus on work placements over theory than those that do not provide training.

The results suggest significant heterogeneity across firms. Firms that

[13] We interacted the attribute levels with an ownership dummy (foreign, domestic) and returned highly significant results which confirm this conjecture.

[14] Interestingly and expectedly, firms that do not provide training prefer an upfront reduction of the levy in return for employment of a recent VETA graduate over being reimbursed for training provision.

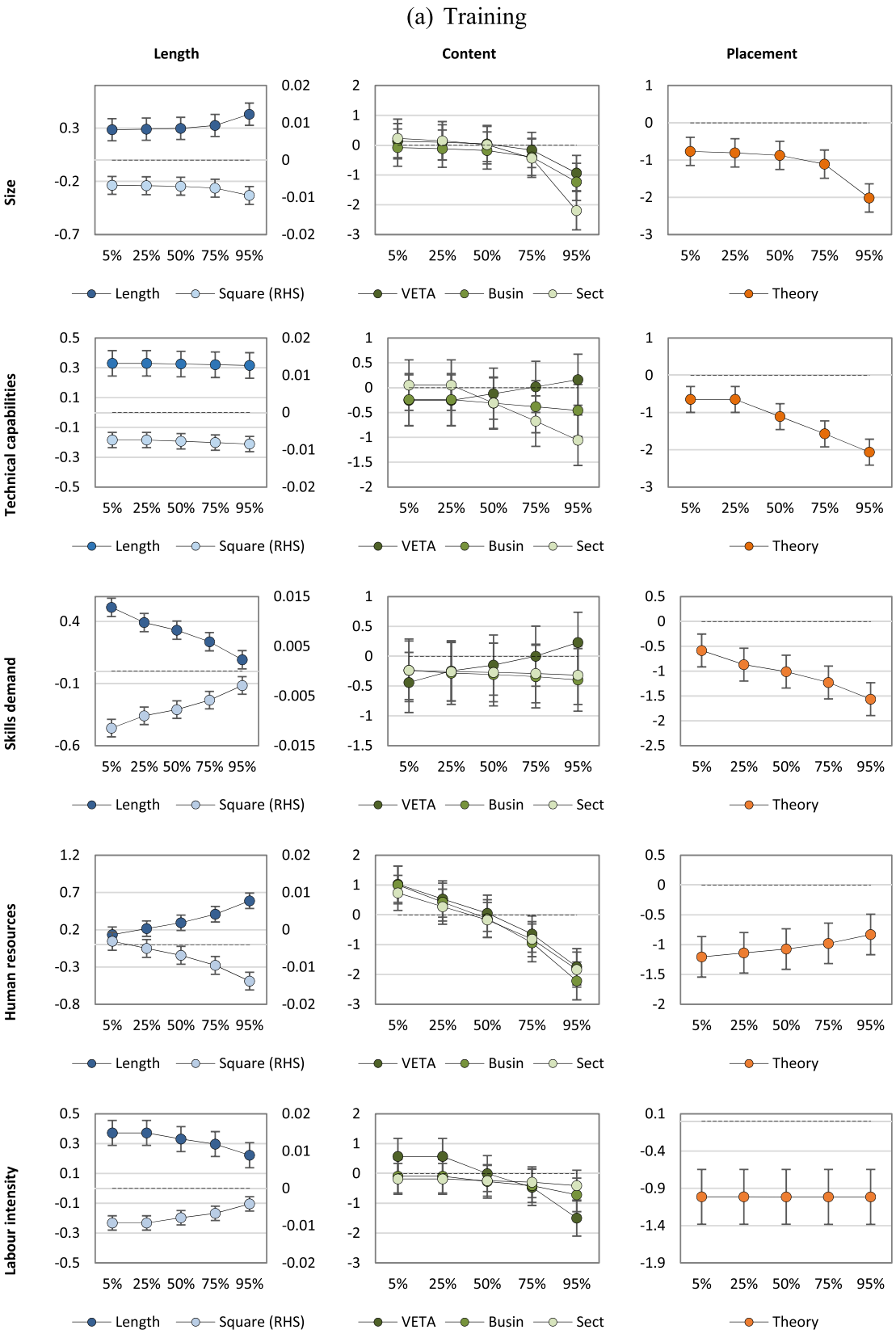

Fig. 6. Changes in WTP estimates with firm characteristics. Note: The horizontal line divides the space between utility and disutility. The error bars are standard errors.
Source: The authors.

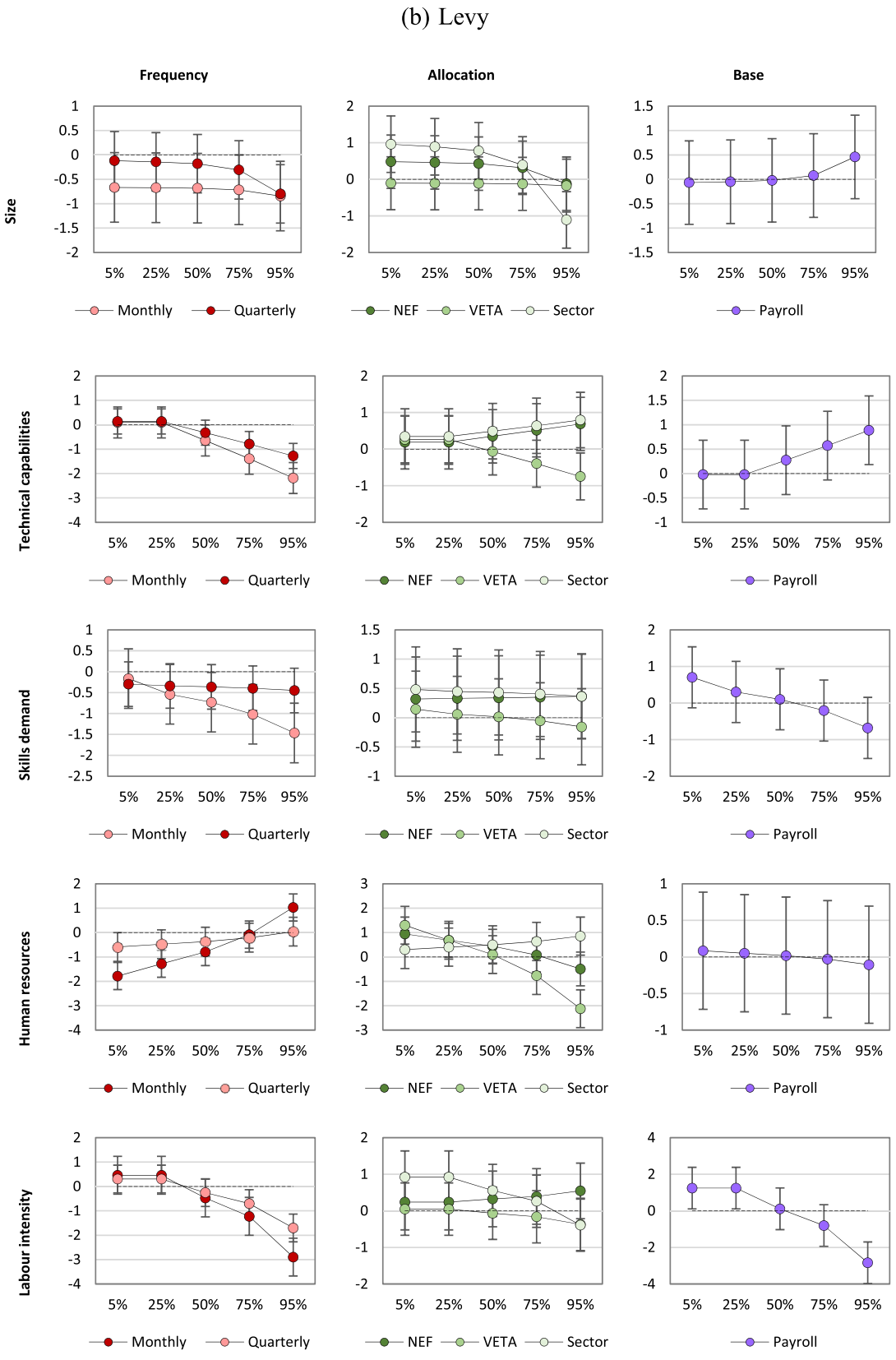

Fig. 6. (*continued*).

provide training welcome the introduction of a sectoral council and the provision of more tailored training courses. These preferences align with firms that have previously been identified as large and highly technically capable (HCMP firms). Such firms also show a preference for the levy to be based on payroll rather than profits and to be reimbursed for training costs rather than an upfront reduction of the levy. Despite the differences in preference structure overall, firms agree that greater emphasis should be placed on field placements as part of standard VET courses,

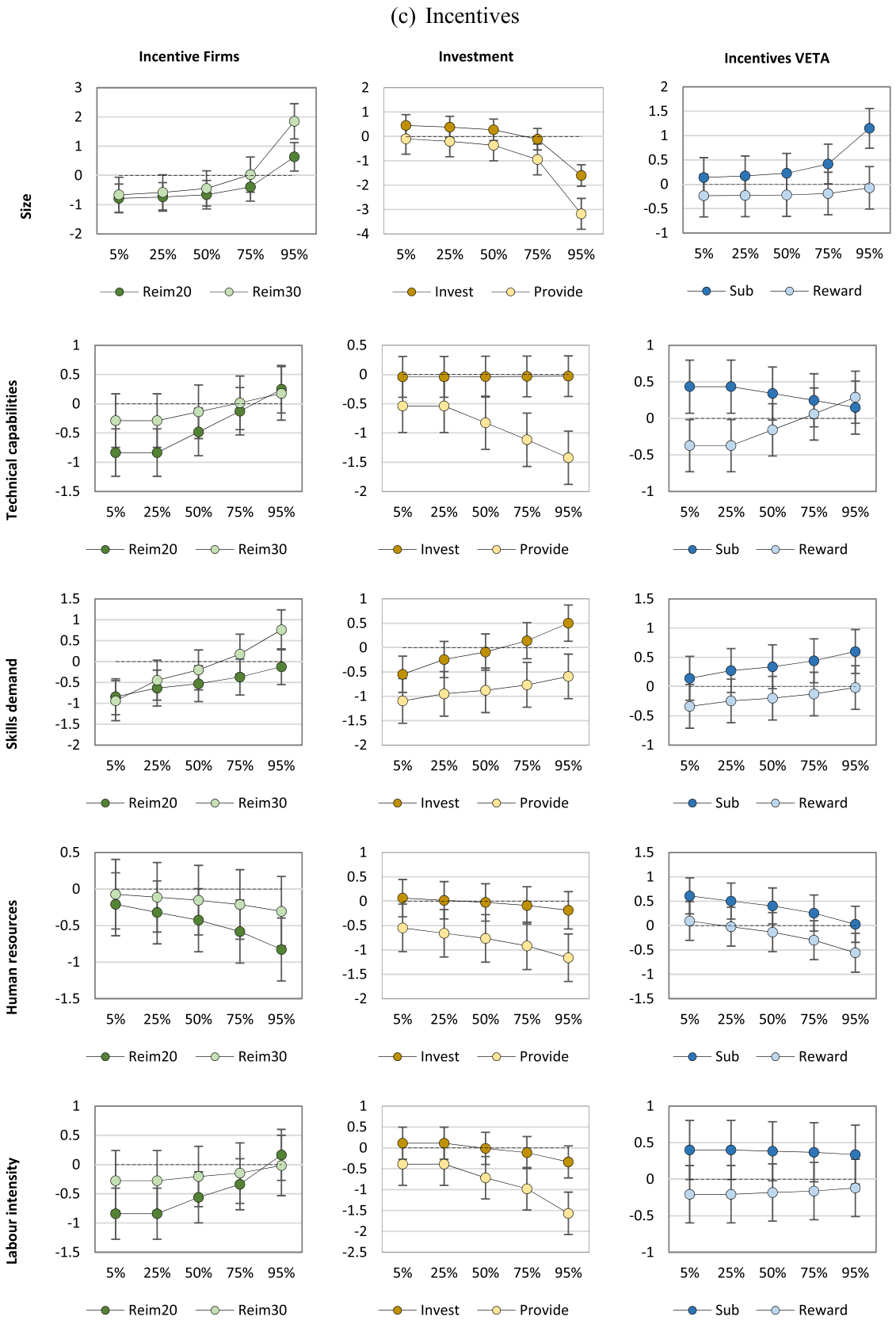

Fig. 6. (*continued*).

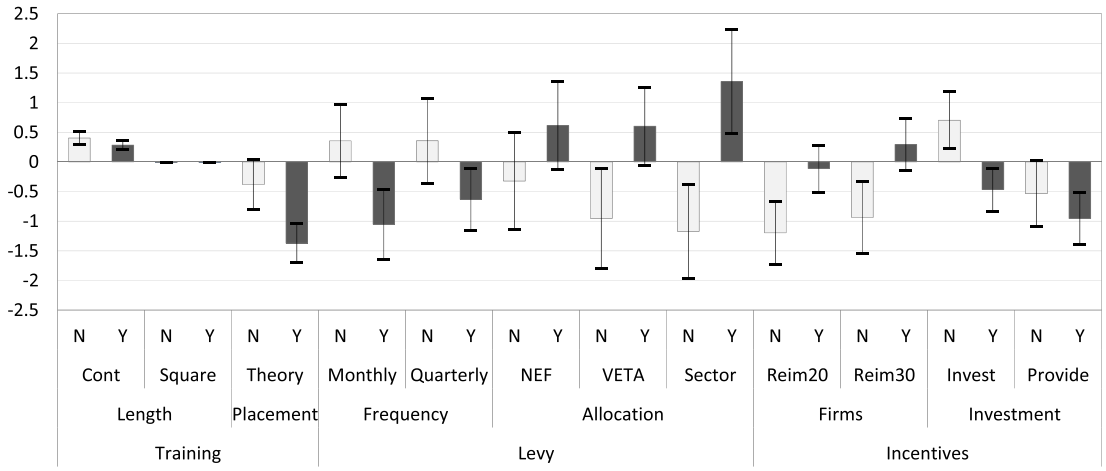

Fig. 7. WTP estimates by training provision. Note: Only significant interaction effects are depicted. Bars indicate standard errors. Light grey (N) = firms with no training provision; dark grey (Y) = firms with training provision.
Source: The authors.

that firms should not provide access to their machinery for training purpose and that the duration of courses should not exceed two years.

5. Designing for differences: An anti-corruption strategy for Tanzania's skills sector

Reforms in the skills sector have been slow in Tanzania and this has made it difficult to improve development outcomes in a key sector of the economy. While all stakeholders recognise the skills sector as a priority, there has been increasing mistrust between the government and the private sector. Allegations of SDL misallocation and double taxation from the private sector have resulted in frustration and have cascaded in chains of rule-breaking behaviours. The high level of the SDL has also acted as a dis-incentive towards formal employment. On the other hand, accusations of large-scale tax avoidance have made it difficult to improve VET-centre outcomes, and several informal practices have emerged at that level along with parallel semi-formal streams of financing.

The general policy response to this low-productivity skills trap has seen the government shifting from a position in which 'vertical enforcement' of the rules (e.g., fighting tax avoidance) has been preferred (indeed, SDL tax collection has increased), to one in which monetary incentives have been introduced in an undifferentiated manner (indeed, incentives have gone to both HCMP and LCLP firms).[15] Our firm-level evidence shows why these efforts have not generated the expected outcomes – the government did not take firms' differences sufficiently into account, hence it failed to re-align the incentives of key stakeholders.

Results from our DCEs, drawing on a stratified sample of more than 200 Tanzanian companies, reveal substantial heterogeneity in preferences across observed firm characteristics. The main differences relate to different dimensions of productive capabilities.

HCMP firms support sectoral councils – hence more sector-specific skills development and joint commitment of funding – and show willingness to engage with curriculum design in collaboration with VETA. These firms also put great emphasis on work experience as part of training. Crucially, these firms are less concerned about the size of the levy or with other financial incentives without improvements in outcomes. This means that HCMP firms would be willing to support an incentive package that prioritises the quality of VET outcomes over a reduction in the cost of the scheme.

In contrast, the preferences revealed for LCLP firms appear skewed towards an incentive package that prioritises a reduction in the costs of the VET scheme while remaining indifferent to most other attributes studied. These firms are happy with most of the levy going to VETA and do not have an interest in a sectoral council or sector-specific training provision.

Against this evidence, an effective strategy to unlock failings in the sector and to enforce rule-following behaviour through horizontal

Table 4
A feasible anti-corruption strategy for the skills sector.

	Incentive package prioritising quality of VET outcomes	Incentive package prioritising costs of VET scheme
HCMP firms	**Aligned interests-incentives scenario** Main features based on incentive package attributes: Training: Customised and tailored curriculum co-developed with VETA. Levy: SDL used mainly for sector-specific training. Incentives: Coordinated investment in sector-specific training facilities. Incentives: Monetary rewards for VETA centres for quality skills outcomes.	**Misalignment of interests-incentives scenario**
LCLP firms	**Misalignment of interests-incentives scenario, but realignment possible with tailored measures including:** Raise awareness about skills-specific needs and profiles. Pathways to join sectoral councils. Reform in SC provision from VET centres.Manufacturing extension service access (also in partnership with technology intermediate institutions) . Dynamic incentives with conditionalities.	**Aligned interests-incentives scenario, but non-conductive to overcoming the low-productivity skills trap**

Source: The authors.

[15] The distinction between 'horizontal' and 'vertical' enforcement is introduced in (Khan et al., 2019). Differently from top-down approaches to policy enforcement, horizontal enforcement leverages peer-pressure and differences in incentives and characteristics across stakeholders.

enforcement should be based on an incentive package designed around the preferences of HCMP firms (see Table 4). Such a package would not only crowd-in the 'right' type of firms – that is, high capability firms that are crucial to lift the sector, jointly with VETA – it would also crowd-out low capability firms that are mainly interested in a reduction in the SDL. The opposite strategy – an incentive package that prioritises the costs of the VET scheme – would be in line with the preferences of LCLP firms but it would not be effective in crowding in the HCMP firms. It must be noted that the incentive package targeting HCMP can also help overcoming some of the search and matching frictions. With HCMP companies being more directly involved in the VET design and delivery – especially through on-the-job training – workers have a chance to signal HCMP firms their level of skills and potential contribution to enhanced productivity. Simply enhancing the quality of VET training, without a more direct involvement of firms would not achieve the same outcomes, and search and matching frictions would remain high.

An incentive package prioritising the quality of VET outcomes has three advantages. First, it is feasible – it will allow the emergence of coalitions of interests across the private and public sector willing to support high-quality VET outcomes. Second, it is effective – it aligns the interests of the powerful organisations with the desired development outcomes. Finally, it is enforceable and less vulnerable to resource misallocation and tax evasion – stakeholders at the sectoral level will have a strong incentive in peer monitoring the flow of resources and in making sure they reward productive arrangements between companies and VET centres.

While selecting an incentive package that prioritises the quality of VET outcomes and is aligned with HCMP firms, the government will need to implement complementary measures to support LCLP firms reaching minimum capability thresholds and crowd-in these firms incrementally via extension services, and training of entrepreneurs. These measures must consider the specific characteristics of the LCLP firms and address the specific challenges that they face. The government must offer such firms a pathway to become more capable and to contribute more to skills development in the country.

These complementary measures for LCLP firms (Table 4, bottom left) should have three objectives:

First, VET centres should work to raise awareness of sector- and technology-specific skills and their benefits. This could help low capability firms to realise the potential of joining sectoral council solutions, being involved in the co-design of skills development programmes, and contributing to the SDL. In turn, this would establish a different dialogue between VET centres and firms, particularly around the proliferation of SCs and their formalisation and transparency of VET centres.

Second, VET centres could partner with existing domestic intermediate technology institutions[16] to provide manufacturing extension services and improve organisational capabilities and operational design solutions so that skills can be deployed effectively. Less than one quarter of firms in Tanzania have ever interacted with these organisations, another example of the problems faced by LCLP firms (MITI and UNIDO, 2016).

Third, dynamic incentives with conditionalities attached could open pathways for LCLP firms to graduate towards high capability status. This could be achieved using time-limited incentives that reward matched investments and other investments in the development of organisational and technical capabilities. The incentives could link also to the extent to which companies retain employees and are willing to invest in their workforce along the graduation journey.

In sum, there is evidence that an incentive package that combines prioritising the quality of VET outcomes (tailored around the preferences and characteristics of high capability firms) with complementary measures (tailored around the characteristics of low capability firms) that offer pathways to graduation from low to high capability status can deliver an effective strategy for the Tanzanian skills sector. This strategy has the merit of horizontal enforcement mechanisms, realigned incentives for key stakeholders and options for those firms willing to be rule-following. The overall outcomes would be one of incremental improvement in this key sector of Tanzania's economy.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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[16] For example, the Tanzania Industrial Research and Development Organization (TIRDO), the Tanzania Engineering & Manufacturing Design Organisation (TEMDO), and the Small Industries Development Organization (SIDO).

Appendix

Appendix A. . Details on research design

A1. Preliminary analysis

Between 2018 and 2019, the research team conducted over 30 interviews with key stakeholders in Tanzania's private and public sectors. The private sector stakeholders included business associations such as the Association of Tanzanian Employers (ATE), the Tanzanian National Business Council (TNBC), the Tanzania Private Sector Foundation (TPSF) several members of Chambers of Commerce (e.g. the Tanzanian Chambers of Minerals and Energy, TCME) and the CEO Roundtable of Tanzania. Following a snowball sampling technique, each of these organisations were asked to provide access to a selected sample of key firms mainly located in Dar es Salaam, for further interviews. Most interviews were conducted following semi-structured interview formats, which were adapted to different types of firms, with the aim of capturing potentially relevant characteristics and stylised facts in terms of their behaviours and opinions on the SDL.

Interviews with public sector institutions involved: multiple engagements with the VET Authority of Tanzania (including some regional boards such the one in Moshi), the National Council for Technical Education (NACTE), the Higher Education Students Loan Board (HSLB), the Tanzanian Education Authority (TEA), the Tanzania Revenue Authority (TRA) and finally three relevant ministries dealing with labour, education and industries respectively.

In all the interviews with public sector institutions we followed a two-pronged approach. A first round of interviews was structured around publicly available secondary data on enrolment, financing, training schemes, and their validation. When data were not readily available or made available, we went to the direct sources. For example, we reconstructed the complete portfolio of long and short courses offered by all VET centres to check for the main features of these training courses. A second round of interviews with public organisations offered interviewees the opportunity to respond to specific issues raised by firms in our previous engagements.

Finally, the collected evidence was further corroborated through focus groups with relevant third sector stakeholders, such as NGOs and international organisations involved in the delivery or financing of training in the East African Community – including the World Bank, and VET authorities in Kenya and South Africa where a skills levy is also used.

A2. Sampling strategy and data collection

Tanzania's Annual Survey of Industrial Production 2016/17 was initially used as sampling frame. We selected firms across 10 manufacturing sectors with more than 20 people engaged, located in six regions in the northeast of the country: Arusha, Dar es Salaam, Iringa, Kilimanjaro, Morogoro and Tanga.[8] The six regions combined cover about 82 per cent of total manufacturing value added in Tanzania, and hence the selection provides a cost-efficient way to cover a substantial share of large manufacturing companies in the country (NBS, 2016).

As summarised in Table A2.1, the strategy yielded 117 pre-selected medium and large firms (See No. of large firms). The selection provided a good coverage in terms of value addition and employment across the selected regions and the country as a whole, except for manufacturing of wood and wood products and furniture (See % coverage of total). This sample was complemented by several smaller firms located in Dar es Salaam. The number of firms registered in Dar es Salaam with 5–19 people engaged came to 400 (See No. of small firms). Another 70–80 firms from this population were targeted to reach a total sample size of around 200 firms.

The selected firms were cross-referenced with data collected by REPOA for the *Global Competitiveness Report* and the most recent list of companies registered with the Business Registration and Licencing Authority (BRELA). Firms were then contacted to confirm the information held by the research team. During this process, several firms were found to have ceased operations since the 2016/17 survey. To compensate for the smaller sample, large and medium-sized firms form additional sectors were included in the final sample (See last 4 rows in Table A2.1)

Table A2.1
Firms selected by sampling strategy and firms reached.

Sector [a]	Sub-sector[b]	No. of large firms.[c]	Large firms selected[cd]	% coverage of total						No. of small firms.[c]	Small firms selected[cd]	Total selected	% share in sample
				All regions & large firms			All regions & all firms						
				No. of firms	Value ad.	Employees	No. of firms	Value ad.	Employees				
Manufacture of beverages	L	16	**20**	40 %	61 %	55 %	22 %	61 %	54 %	4	**1**	**21**	**10.05 %**
Manufacture of chemicals	H	9	**14**	39 %	26 %	31 %	11 %	25 %	29 %	5	**5**	**19**	**9.09 %**
Manufacture of fabricated metal	M	5	**3**	26 %	46 %	27 %	0 %	42 %	8 %	66	**0**	**3**	**1.44 %**
Manufacture of food products	L	49	**19**	32 %	37 %	33 %	2 %	36 %	26 %	118	**11**	**30**	**14.35 %**
Manufacture of furniture	L	5	**12**	21 %	7 %	13 %	0 %	6 %	5 %	68	**5**	**17**	**8.13 %**
Man. of other non-metallic minerals	M	8	**12**	21 %	77 %	35 %	1 %	73 %	21 %	33	**7**	**19**	**9.09 %**
Manufacture of rubber and plastics	M	13	**17**	41 %	56 %	42 %	22 %	55 %	40 %	0	**2**	**19**	**9.09 %**
Manufacture of textiles	L	7	**7**	29 %	24 %	12 %	2 %	24 %	12 %	7	**2**	**9**	**4.31 %**
Manufacture of wearing apparel	L	2	**4**	25 %	25 %	9 %	0 %	21 %	5 %	44	**0**	**4**	**1.91 %**
Manufacture of wood	L	3	**3**	17 %	3 %	6 %	0 %	2 %	3 %	55	**0**	**3**	**1.44 %**
Other manufact., high-tech	H	–	**9**							–	**2**	**11**	**5.26 %**
Other manufact., med-tech	M	–	**19**							–	**1**	**20**	**9.57 %**
Other manufact., low-tech	L	–	**25**							–	**0**	**25**	**11.96 %**
Other non-manufacturing	–	–	**7**							–	**2**	**9**	**4.31 %**
Grand total		117	**171**							400	**38**	**209**	**100 %**

Notes: For instance, the initial sampling strategy taking the Tanzania's Annual Survey of Industrial Production 2016/17 as sample frame resulted in the selection of 16 large firms and 4 small firms in the Manufacture of beverages sector. The selected firms covered 40 % of all large firms and 22 % all firms in the sector, 61 % of value added by large firms and all firms in the sector, and 55 % and 54 % of total number of employees by all large firms and all firms respectively in the sector. The revised sample frame resulted in the selection of 20 large firms and 1 small firm resulting in 21 firms interviewed that operate in the sector, making up 10.05 % of the total sample.
a) Selected regions: Arusha, Dar es Salaam, Iringa, Kilimanjaro, Morogoro and Tanga.
b) L: low-tech, M: medium-tech, H: high-tech.
c) Medium and large firms are those with 20 or more employees. Small firms are those with fewer than 20 employees. Firms with no information about number of employees are counted as small firms also.
d) Industry affiliations have been established by drawing from information provided in Part A question 1.4 with Part C question 2.1 and with reference to ISIC Ref. 4: https://unstats.un.org/unsd/classifications/Econ/Download/In%20Text/ISIC_Rev_4_publication_English.pdf .
Source: The authors.

.Following this augmented sampling strategy, a total of 178 large and medium size firms and 38 small firms were reached, resulting in a total sample of 216. Seven of these firms were excluded from the analysis as the missing data share was too large, leaving a sample size of 209 (See Appendix A3 for more detail on data cleaning and missingness). In line with our sampling strategy, the largest share of firms in the sample are from Dar es Salaam (62 %), Arusha (14 %) and Morogoro (11 %); the three regions that rank highest in terms of total manufacturing value addition (NBS, 2016).

For almost all sectors, the number of medium and large firms in our sample exceeds the number in the pre-selected sample. Some firms have only recently started operations and hence are not included in the 2016/17 survey. However, the great majority of firms not covered in the sample frame have grown over recent years and have since crossed the threshold of 20 or more people engaged. With the coverage of sectors expanded, we were able to reach a more balanced sample in terms of technological classification with 55 % of firms falling into the low-tech category (70 % in the pre-selected sample).

The DCEs and the questionnaire were piloted in January and February 2019 and the DCEs, questionnaires and sampling strategy were finalised in March 2019. Between June and August 2019, questionnaires and DCEs were coded using Open Data Kit[17] which enabled data collection using tablets. REPOA recruited 12 research assistants from its own database for enumeration. Enumerators went through a two-day intensive training course in early September 2019. After completion of the training, the survey was piloted again with selected firms in Dar es Salaam that met the sampling criteria but that were not part of the sample.

A3. Data cleaning and transformation

The questionnaire is divided into three parts: A, B and C. These parts were answered by different staff, at different points in time, and were later

[17] https://opendatakit.org/

matched by a unique identifier. The unique ID of the device on which the answers were recorded (held by the enumerator) as well as a timestamp of the entry were also used to match the parts of the survey. This measure was introduced in case errors were made when the unique company identifiers were recorded.

Table A3.1
Matching parts A, B, C of the questionnaire.

Missing	
AM014	Missing from C
EL009	Missing from C
EK003	Missing from C
EK004	Missing from C
Enumerator errors	
GM15	Matched with GM015 in A and C
GM0016	Matched with GM016 in A and C
Am022	Matched with Wm022 in C
PP029	Matched with PPO29 in A and C
GM010	No part A and hence not matched (A only has GM 001 but the time stamp does not match, hence both are excluded)
JM002	Appears twice throughout for different companies. Matched the first entries with ID_35 and the second with ID_60 judging by the time stamp when the data was collected.
GM005	Appears twice in C with entries identical up until question 3.2. Afterwards entries differ. We selected the first entry as the data was more in line with data from question 3.1.

Source: The authors.

Matching left us with 216 companies that responded to all three parts of the questionnaire. Part A and B were complete for these companies. However, Part C suffered from missing observations for several companies. Note that some questions with qualitative responses are missing from Table A3.2. Out of these 216 companies, 4 companies did not respond to any question in Part C and another 3 did not respond to any questions regarding employees in Part C (Section 3). We excluded these seven companies. This leaves a set of 209 companies with complete responses for most variables.

Table A3.2
Missingness of data for part C of questionnaire.

Question	Number missing	Percent missing	Number complete
2.1_Value_Sold	66	31	150
2.2_Capacity_Utilization	90	42	126
2.3_Fixed_Assets	101	47	115
2.4.1_Investment	78	36	138
2.4.2_Turnover	80	37	136
2.4.3_Profit	85	39	131
2.5_Goods_Purchased	88	41	128
2.6_Capital_Goods	131	61	85
2.7_Machinery	19	9	197
2.8.1_Energy_Supplier	4	2	212
2.8.2_Blackouts	4	2	212
2.8.3_Owns_Generator	4	2	212
2.9_Number_Production_Lines	4	2	212
2.10_ICT	4	2	212
2.11_Certification	4	2	212
2.13_Laboratory_Quality_Control	4	2	212
2.14_Royalties_Technology	4	2	212
2.15_Laboratory_RD	4	2	212
3.1_Permanent_Regular_Employees	7	3	209
3.2_Skilled_Unskilled_Employees	7	3	209
3.3_Education_Level_Employees	7	3	209
3.4_Total_Payroll	85	39	131
3.5_Work_Experience_Employees	7	3	209
3.8_Training_Provided	4	2	212
3.11_Employee_Skills_Assessment	4	2	212

Source: The authors.

Table A3.3 provides a full breakdown of the sample by size of firm, sector and technological classification in comparison to the targeted sample.

Table A3.3
Firms reached by sector and size.

Sector[a]	Sub-sector[b]	Medium & large firms[c]	% relative to sampling strategy	Small firms	Total	% share in sample
Crop and animal production	–	3	–	0	3	1.44 %
Fishing and aquaculture	–	1	–	0	1	0.48 %
Manufacture of basic metals	M	19	–	1	20	9.57 %
Manufacture of beverages	**L**	**20**	**125 %**	**1**	**21**	**10.05 %**
Manufacture of chemicals and chemical products	**H**	**14**	**156 %**	**5**	**19**	**9.09 %**
Manufacture of electrical equipment	H	3	–	0	3	1.44 %
Manufacture of fabricated metal products	**M**	**3**	**60 %**	**0**	**3**	**1.44 %**
Manufacture of food products	**L**	**19**	**39 %**	**11**	**30**	**14.35 %**

(continued on next page)

Table A3.3 (*continued*)

Sector[a]	Sub-sector[b]	Medium & large firms[c]	% relative to sampling strategy	Small firms	Total	% share in sample
Manufacture of furniture	**L**	**12**	**240 %**	**5**	**17**	**8.13 %**
Manufacture of leather	L	4	–	0	4	1.91 %
Manufacture of machinery and equipment	H	5	–	2	7	3.35 %
Manufacture of other non-metallic mineral products	**M**	**12**	**150 %**	**7**	**19**	**9.09 %**
Manufacture of paper	L	8	–	0	8	3.83 %
Manufacture of pharmaceuticals	H	1	–	0	1	0.48 %
Manufacture of rubber and plastics products	**M**	**17**	**131 %**	**2**	**19**	**9.09 %**
Manufacture of textiles	**L**	**7**	**100 %**	**2**	**9**	**4.31 %**
Manufacture of tobacco products	L	2	–	0	2	0.96 %
Manufacture of wearing apparel	**L**	**4**	**200 %**	**0**	**4**	**1.91 %**
Manufacture of wood and of products of wood and cork	**L**	**3**	**100 %**	**0**	**3**	**1.44 %**
Other manufacturing	–	1	–	0	1	0.48 %
Other mining and quarrying	–	2	–	1	3	1.44 %
Printing and reproduction of recorded media	L	10	–	0	10	4.78 %
Repair and installation of machinery and equipment	–	0	–	1	1	0.48 %
Services	–	1	–	0	1	0.48 %
Grand total		**171**	**136 %**	**38**	**209**	**100 %**

Notes: a) Sectors included in the sampling strategy are highlighted in bold. Industry affiliations have been established by drawing from information provided in Part A question 1.4 with Part C question 2.1 and with reference to ISIC Ref. 4: https://unstats.un.org/unsd/classifications/Econ/Download/In%20Text/ISIC_Rev_4_publication_English.pdf.
b) L: low-tech, M: medium-tech, H: high-tech.
c) Medium and large firms are those with 20 or more employees. Small firms are those with fewer than 20 employees. Firms with no information about number of employees are counted as small firms also.
Source: The authors.

A4. Productive capabilities index construction

Table A4.1 provides a summary of the variables used for index construction via PCA.

Table A4.1
Capability indices, their interpretation and input variables for construction.

Index name	Direction	Variable input for construction
Size	Small to large	• number of employees, • number of production lines, • whether a firm is a conglomerate or not.
Technical capabilities	Low to high	• presence of certificates and standards, • presence of laboratories for quality control, • research and development (R&D).
Skills demand	Low to high	• growth in permanent employees over reference period, • growth in regular employees over reference period, • age of firm.
Human resources	Low to high	• share of skilled employees, • share of employees with vocational education, • share of employees with STEM education.
Labour intensity	Low to high	• share of permanent employees in total employees, • level of automation in production processes.

Table A4.2 provides summary statistics of the constructed indices. As would be expected, size is positively correlated with technical capabilities and human resources and skills demand is positively correlated with labour intensity. Overall, the correlation between indicators is low (except for size and technical capabilities) suggesting that they indeed capture distinct dimensions of productive capabilities.

Table A4.2
Summary statistics for capabilities indices.

	(a) Size	(b) Technical capabilities	(c) Skills demand	(d) Human resource	(e) Labour intensity
	Summary Statistics				
Min	−0.7559	−1.1690	−4.1975	−1.6191	−1.1277
Max	8.8086	2.7178	4.1440	3.7762	2.7789
Var	1.5514	1.6735	1.5611	1.2124	1.1419
Skew	3.7276	0.6910	0.2038	0.8323	0.8022
Kurt	21.1490	2.2100	3.9939	3.3223	2.7541
	Percentiles				
5 %	−0.7343	−1.1690	−1.8185	−1.4407	−1.1277
25 %	−0.6326	−1.1690	−0.7126	−0.8202	−1.1277
50 %	−0.4687	0.0966	−0.1574	−0.2248	−0.1973
75 %	0.1055	1.3705	0.6897	0.6465	0.5532
95 %	2.3159	2.7178	2.0030	2.0181	2.2225
	Correlation				
(a) Size	1				
(b) Tec cap	0.3419	1			

(*continued on next page*)

Table A4.2 (*continued*)

	(a) Size	(b) Technical capabilities	(c) Skills demand	(d) Human resource	(e) Labour intensity
(c) Skills dem	−0.2025	−0.0716	1		
(d) Hum res	0.0451	0.1595	−0.1978	1	
(e) Lab int	0.0831	−0.1263	0.1276	−0.1456	1

Notes: Standardised so that all indices are mean 0. Standard deviation is also around 1 due to standardisation of input indicators.
Source: The authors.

Appendix B. . Additional figures and tables

Table B1
Perceived skills gap by employee category.

	Interpersonal	Writing	Problem Solving	Critical Thinking	Work Ethic	English	IT	Job Specific
	Managerial and Professional Staff							
Above	59.26 %	51.85 %	48.15 %	50.62 %	53.09 %	34.57 %	37.04 %	45.68 %
Adequate	37.04 %	44.44 %	48.15 %	40.74 %	41.98 %	49.38 %	48.15 %	48.15 %
Below	3.70 %	3.70 %	3.70 %	8.64 %	4.94 %	16.05 %	14.81 %	6.17 %
	Operational Skilled							
Above	37.04 %	29.63 %	41.98 %	32.10 %	43.21 %	12.35 %	16.05 %	40.74 %
Adequate	58.02 %	59.26 %	51.85 %	59.26 %	50.62 %	60.49 %	56.79 %	55.56 %
Below	4.94 %	11.11 %	6.17 %	8.64 %	6.17 %	27.16 %	27.16 %	3.70 %
	Operational Non-Skilled							
Above	24.69 %	14.81 %	13.58 %	14.81 %	25.93 %	6.17 %	8.64 %	20.99 %
Adequate	60.49 %	53.09 %	65.43 %	60.49 %	61.73 %	46.91 %	54.32 %	66.67 %
Below	14.81 %	32.10 %	20.99 %	24.69 %	12.35 %	46.91 %	37.04 %	12.35 %

Notes: Categories include above required (Above), adequate (Adequate), below required (Below).
Source: The authors.

Table B2
Glossary of variable names and description.

Attributes		**Attribute Levels**	
Variable	**Description**	**Variable**	**Description**
Size	**Size**: What would be an appropriate size for the skills levy?	2.5	2.5 (in %)
		3.5	3.5 (in %)
		4.5	4.5 (in %)
		5.5	5.5 (in %)
Length	**Length**: What should be the length of typical certified training provided by VETA?	6 *m*	6 months
		9 *m*	9 months
		2y	2 years
		3y	3 years
Size/ Length	Size or Length if coded as continuous variables.	Cont	Continuous
		Cont_sq	Squared
Content	**Content**: Who should oversee the design of the curriculum of the training?	VETA	**VETA** in consultation with business associations/ chambers of commerce
		Busin	**Business associations**/ chambers of commerce and ratified by VETA
		Sect	Newly established **sector skills councils** and ratified by VETA
		Cust	**Customised curriculum** by individual firms co-developed with VETA
Place	**Placement**: What share of work experience should the ideal training have and in what way should the work experience be ensured?	Theory	**2/3 theory** and 1/3 field placement/internship
		Field	1/3 theory and **2/3 field placement**/dual apprenticeship
Freq	**Frequency**: With what frequency should the skills levy be payable?	Month	Monthly
		Quarter	Quarterly
		Year	Yearly
Base	Base: How should the levy be determined?	Payroll	Levy as a percentage of **payroll**
		Profit	Levy as a percentage of **profit**
Allocation	**Allocation**: How should the skills levy be allocated and managed?	NEF	Pooled: 1/3 to VETA, **2/3 to National Education Fund**
		VETA	Pooled: **2/3 to VETA**, 1/3 to National Education Fund
		Sector	All to VETA: **2/3 for sector-specific training**, 1/3 for other types of training
		Other	All to VETA: 1/3 for sector-specific training, **2/3 for other types of training**
Firms	**Incentives for firms**: What would be the most favourable concession against a contribution to skills training?	Reim20	**Reimbursement** of incurred training costs up to **20 %** of levy
		Reim30	**Reimbursement** of incurred training costs up to **30 %** of levy
		Red30	**30 %** upfront **reduction** of levy for the first three years of employment of a recent VETA graduate
Invest	**Investment**: What would you be willing to contribute to the training?	Invest	**Investment** in training teaching staff, machinery, equipment and facilities
		Provide	**Providing access** to machinery, equipment and facilities in the company
		Joint	**Joint investment** in training teaching staff, machinery, equipment and facilities as part of sectoral council/chamber of commerce/business association

(*continued on next page*)

Table B2 (*continued*)

Attributes		Attribute Levels	
Variable	**Description**	**Variable**	**Description**
VETA	**Incentives VETA**: In your opinion, which incentive would make VETA centres most responsive to your company's needs and improve the quality of training?	Prof	VETA centres **retaining the profits** from offering SCs at competitive rates
		Sub/ Substi	VETA centres **receiving a subsidy** for providing SCs customised for individual firms
		Reward	VETA **centres receiving a financial reward** with each student who gets a full-time job

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