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Information flows and adaptation in Tanzanian cottage industries

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The aim of this research is to identify channels of information flows and their impact on business adaptation and survival. The analysis is set within a theoretical framework of information market failure and information flows. The paper draws on empirical data from a survey comprising approximately 400 small-scale entrepreneurs in dressmaking and woodworking industries at different levels of centrality in four regions in Tanzania. The data reveal that half of the businesses are growing and one-third have increased profitability by significant adaptations last year. Most changes occur in products and design. Customers and the media represent the most important sources of business information, followed by family members and business partners. Independent variables that significantly influence adaptability include customer relations, education, media exposure, social networks, and mobility. Associations are strongly modified by the entrepreneurs' age and gender and by businesses' size and location. The paper concludes that cottage industries in Tanzania have a remarkable ability to survive. Garment and woodwork markets are still predominantly local and competition from external businesses is limited. Access to business information and new ideas should be improved, however, to counteract growing competition from the modern sector.

Keywords: garment; woodwork; small-scale; location; Africa.

1. Introduction

In the era of a liberalized economy and a globalized society, business entrepreneurs in Africa have had increased opportunities to adapt businesses and expand markets. Profitable enterprises with a wide geographical range have been developed. Opportunities are not equal for everyone, however, and with the recent economic growth on the African continent, including in Tanzania, there are clear tendencies towards increasing business and social differences (Stein and Nissanke 1999, Ellis and Mdole 2003). Small-scale entrepreneurs and cottage industries in peripheral areas are easily marginalized in open competition with foreign investors and centrally located modern enterprises.

Recently, in Tanzania small-scale businesses have grown in number. Still, potential resources from small-scale entrepreneurs are not fully harvested (Satta 2003). Thousands of cottage industries operate along traditional lines of organizing

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production and marketing. In the African context in general, two specific problems are related to an economic development strategy based on small-scale entrepreneurs: one is the dominance of 'copyists', which means imitative rather than innovative businesses; the other is a limited ability to compete, on price and quality, in a liberalized economy. Both concern access to business information and exposure to new ideas and market development trends.

It has been argued that the main problem for cottage industries in developing countries is not their small size but their isolation, which hinders access to markets, as well as to information, finance and institutional support (Mead and Liedholm 1998). Several recent studies of factors behind entrepreneurial success in poor countries tend to place more emphasis on access to information than on access to capital through banks and credit schemes (Brockhaus 1991, Awasthi and Sebastian 1996, Saini and Bhatia 1996, Nafukho 1998). According to Poston (1994: 32), artisans in a typical rural African context are faced with a general unavailability of inputs and an almost total lack of information about the ways in which change can be accommodated or employed advantageously.

This paper aims to discuss relevant sources of information and strategies for increased access to information, and thereby the improved adaptability and competitive strengths among small-scale enterprises in Africa. The paper is empirically based on a survey of approximately 400 cottage industry tailors and carpenters at various locations in Tanzania. The two lines of business are selected because they are present in most areas of a developing economy, even at rural and peripheral sites. The sample is drawn from the total population of enterprises in a number of purposely selected wards at various levels of geographical and administrative centrality in the four regions of Dar es Salaam, Morogoro, Iringa and Mbeya. All interviewed persons are the owners of their own enterprises.

The paper is organized in six parts. Following this introduction there is a theoretical section on adaptability and survival of micro and small-scale industries in developing economies. Section 3 aims to bring in a more specific theoretical basis for the empirical analyses and the focus is on access to information, and includes a research model and hypotheses. The research design and methodology are presented in section four, together with a description of study areas. Section 5 offers the presentation of empirical findings and statistical analyses and the paper ends with a concluding discussion.

2. Adaptation and business survival

Previous studies of small-scale garment and woodworking industries in Tanzania have concluded that creativity and progress is limited due to a lack of information and business skills (Kristiansen 2004a, b). Profitability and salaries in such industries in Africa are still very low. However, several recent empirical studies have recounted that traditional industries thrive in Tanzania today (Mihanjo 2001, Müller 2001) and that they are able to 'negotiate their position and development in interaction with agriculture on the one hand and the urban economy on the other', thus securing their survival and even growth (Pedersen 2001: 18). Small-scale enterprises, especially in rural and peripheral areas, are still able to combine survival and even growth with their limited access to information and subsequent lack of innovativeness. Business adaptations are often defensive, rather than dynamic. They may be based on minor

adjustments to designs on products for local markets rather than general productivity improvements or expansion into new market areas.

As theories of information asymmetry and imperfect information markets are advanced (Stiglitz 1989, Besley 1994), economic losses in developing regions caused by incomplete and costly knowledge have received increasing attention. Imperfect information prevents awareness among potential entrepreneurs of possible market transactions with net benefits. In the market for information and knowledge, potential customers are typically ignorant of potential gains from obtaining services above their level of awareness. Private production or supply of information may be inhibited because potential purchasers find it difficult to evaluate information prior to its acquisition. A transition to new technology, higher quality or different market areas that offer benefits greater than costs cannot be accommodated, and inefficient or sub-optimal economic organizations become the dominant long-run equilibrium outcome. According to Weiler (2000), information about market opportunities could be particularly lacking in lagging regions, resulting in regressive forms of market failure. The physical and cultural-psychological distance between the lagging regions and the core areas of economic and intellectual activity may put them at a severe disadvantage for diffusion of information, innovation and potential growth.

In a world of frictionless markets and perfect institutions there would be no transaction costs and thus factors of production can move to maintain equilibrium, exclusive of entry barriers. The involved actors would have complete information about market opportunities, costs and benefits. However, in reality even neo-classical economists know that economic agents only act to move the system back to equilibrium when the deviation from equilibrium exceeds a critical threshold, whereby the benefits of adjustment exceed costs. Concurrently, increasing attention in economics maintains that incomplete and costly knowledge cause 'x-inefficiency' in society (Leibenstein 1966, Stiglitz 1989, Arnott *et al*. 1994). Lack of information, or lack of efforts to gather information, as well as lack of motivation and incentives to change, create a substantial time lag before individuals and firms accomplish potential improvements in technology, marketing and management, and levels of x-inefficiency are kept high. In the reality of small-scale business in developing economies, limited information on business alternatives simply impedes a shift into potential production with higher profitability and growth prospects (Kristiansen 2003).

In developing economies with a dominant labour surplus, unemployed people flock into businesses with proven ability to sustain previous business starters. Limited information on business alternatives, together with a lack of competence and capital, impede a shift into trades and markets with higher entry barriers and profitability. These barriers sustain path dependence (North 1993). Imitative businesses dominate over innovative entrepreneurship, which can easily imply low and diminishing margins in business and 'shared poverty' in society (Geertz 1963).

Barr (2000) made a distinction between various forms of business information of importance for entrepreneurial development in Africa. In her study she found that information on markets and technological aspects were of special importance to manufacturing industries in Ghana. Information on design, trustworthiness of potential partners, and on government policies also appeared to be of significant value for business growth.

Limited flows of business-related information and know-how seem to be a main hindrance for adjusting to more competitive contexts for small-scale and cottage enterprises, e.g. information on markets and alternative channels for the purchase

of raw materials and tools or machines. Enterprises in Tanzania tend to be 'losing customers and reducing capacity, and adaptations are defensive rather than dynamic and advancing' (Kristiansen 2004a: 389). While commodity markets have become free and globalized, and financial institutions have developed for international transactions, the market for information has hardly been established for small-scale enterprises in this environment. Meanwhile, small-scale Tanzanian entrepreneurs have pointed to the following potential sources of information and skills for their business development: customers, education, media, social networks, and physically moving out of one's region (Kristiansen and Mbwambo 2003, Kristiansen 2004a). In the following section, these potential means of knowledge supply are discussed in more detail. Measures of business adaptability are also introduced and these are the dependent variables in this research.

3. Sources of information and skills for business adaptability

It is not easy to measure among informal and small-scale enterprises in an African context, whether business adaptations are defensive or dynamic. Firm accounts are rarely available and hardly reliable, and critical and participant observation is difficult to combine with a survey approach. Based on previous case studies and recent quantitative research on micro-scale entrepreneurs in Tanzania (Kimeme 2005, Mbwambo 2005), it was found that the validity and reliability of entrepreneurs' subjective measures of their own adaptability are acceptable, and thus the best way to quantify changes in a study like this. The three variables selected are 'business development', 'major change last year', and 'number of changes'.

Our empirical analyses of business adaptability include five independent variables related to access to information. These are customer relations, education, media exposure, social networks, and mobility. In this section, we seek support from previous empirical studies for stating hypotheses on relations between access to information and business adaptability. Operationalization of dependent and independent variables follow in section 4.

3.1 Customer relations

There is a general agreement that customer relations are essential for business success, but there are few empirical studies on the impacts of such relations in comparison with other sources of information, especially for small-scale enterprises in Africa. In a study from Lesotho, Masten and Brown (1993: 142) found that good customer relations were crucial for the development of small-scale producers of garments, leather and metal work and some other goods and services. In a survey of 100 entrepreneurs, the interviewed businesspersons 'felt that the most important skill contributing to success was treating customers well and listening to what customers were saying. The second most important skill was the ability to develop a reputation for providing high-quality goods and services'. From Ghana, Barr (2000) also found that regular and dense contacts between buying and selling enterprises facilitate flows of knowledge between them. In addition, from Indonesia, Sandee (1994) has clearly documented how close contacts with traders and middlemen pass on essential technical, financial and market

information. The function of middlemen and networks enables rural industries to develop even without the support of a local market.

Hypothesis 1: Positive statistical associations are expected between customer relations and business adaptability.

3.2 Education

Previous empirical studies from Africa have also found significant correlations between levels of education and business adaptation and performance (Vijverberg 1991, Rasmussen 1992). Similarly, from India, Sinha (1996) revealed that the level of education is important for entrepreneurial intention as well as for business success. Also from Asia, Lee (1997) found that university education had a great impact on the need for achievement of women entrepreneurs in Singapore. In a study of Asian values and development, Cummings (1996) concluded that the extensive provision of education in Asian countries, such as in South Korea, Singapore, Taiwan, Malaysia, Thailand and China, has facilitated the general access to information and the entrepreneurial drive there. In a survey of factors behind business success in sub-Saharan Africa, Ramachandran and Shah (1999) found that formal education, both secondary and university, is significantly correlated with firm growth. What matters in education is not only knowledge and skills learned, but the enhanced ability to learn and to seek information.

Obviously, the value put on education and the efforts mobilized for achievement in schools are related to income, culture and traditions, and vary significantly among locations and ethnic and social groups in Africa. In Tanzania for instance, almost all members of Asian sub-groups complete secondary education, while the average share of the African Tanzanian population graduating from secondary school is less than 5%. Primary enrolment rates are generally high, but attendance at higher levels is skewed, also by gender and geography. Enrolment rates at secondary level are substantially higher for males and in urban areas.

Hypothesis 2: Statistical associations between entrepreneurs' level of education and business adaptability are expected to be found.

3.3 Media exposure

It is generally recognized that exposure to media, such as radio, newspapers and TV, creates opportunities for access to new ideas and business information. Singh and Krishna (1994), in their studies of entrepreneurship in India, pointed out that eagerness in information-seeking is one of the major entrepreneurial characteristics. Information-seeking refers to the frequency of contacts that an individual makes with various sources of information, such as newspapers, magazines and books. The result of this activity is most often dependent on general information accessibility, either through individual efforts and human capital, or as a part of social capital and networking. Shaw (1987) found that early adopters of technology in rural, developing areas tend to be significantly more exposed to mass media and a variety of information channels. In addition, Baron (2003) found that frequent media usage, including the Internet, opens up a wider range of possibilities for entrepreneurial

adaptations. Hisrich and Peters (1998: 235) have also documented how the use of the Internet represents a profitable enterprise investment in access to information, as long as public infrastructure is available.

For a long time in Tanzania, newspapers and radio channels have been sources of information on political, as well as economic and business issues, even in peripheral areas. More recently, television coverage has been geographically expanded and TVs can now be found in most villages. Even access to the Internet has become common in many places through the establishment of privately owned Internet cafés over the last few years. Such infrastructure is limited, however, to larger cities, mainly in the regional centres.

Hypothesis 3: Positive statistical associations between media exposure and business adaptability are expected.

3.4 Social networks

The study of entrepreneurship has increasingly reflected the general agreement that entrepreneurs and new companies must engage in networks to survive (Huggins 2000). Networks represent a means for entrepreneurs to reduce risks and transaction costs and improve access to business ideas and knowledge. A social network consists of a series of formal and informal ties between the central actor and other actors in a circle of acquaintances. According to Sverrisson (2001), entrepreneurship is based on knowledge that is embedded in social structures and facilitated by networks. The social networks' quality is determined by the number of social relations, diversity of ties, and network dynamics (Johannisson 1995).

Social networks are developed on a basis of cultural resources and differ widely among ethnic and sub-cultural groups in Africa. McCormick (1998), in her studies of garment industries in Kenya, found that networks diverge greatly, being segregated by ethnicity and level of education. Network characteristics, according to McCormick (1998: 120) 'at least partially explain the different operating styles and growth potential among garment manufacturers'. This has been seen in many African countries between business people of Asian origin and those of native backgrounds (McCormick 1996), but differences can also be observed among different indigenous African ethnic groups (Chukwuezi 2001, Meagher 2001, Havnevik *et al*. 2003). From Africa and elsewhere, studies have documented how social connections to extra-local networks play a crucial role in providing access to wider sources of information and knowledge (Kristiansen and Ryen 2003, Mackinnon *et al*. 2004).

Hypothesis 4: It is expected that the extension of business owners' social networks is positively associated with their business adaptability.

3.5 Mobility

Previous case studies of small-scale garment and woodwork entrepreneurs in Tanzania have clearly documented how mobility may influence their access to information and thereby their business adaptability (Jensen and Kristiansen 2004, Kristiansen 2004a). For women in particular, Chitsike (2000) found that culture and traditions in Zimbabwe created barriers for travelling and that a lack of external contacts hindered

flows of information and access to potential market areas. Women who travelled were often regarded as 'cheap' and associated with 'dirty games' and prostitution. Also from Tanzania, Kristiansen and Mbwambo (2003: 374) reported that mobility is generally limited and especially so for women, thus curtailing access to information. As stated by one female entrepreneur in Iringa: 'Being a woman and a married one, there are things I am limited to do, included travelling'.

In contrast, in Colombia, Kyle (1999) found that high physical mobility and temporary migration created the basis for the overseas market expansion of inexpensive handicrafts from cottage industries. Similarly, from China, Murphy (2000) revealed that returned migrants used their experiences and new ideas for business creation to promote changes in the local political environment. These mobile people represent dynamic agents for information transfer, creativity and entrepreneurship. Also from Thailand, Jongeward (2002) reported on the importance of physical mobility for access to business information and entrepreneurs' adaptability. Transforming traditional local craftwork into products fit for modern taste and urban markets has been possible by the close collaboration and regular meetings between local artisans and international textile and fashion consultants.

Hypothesis 5: It is expected that entrepreneurs' mobility is positively associated with business adaptability.

3.6 Conditional variables

In our empirical analyses, we shall also take into consideration the impacts on adaptability of entrepreneurs' age and gender and of business size and location. These items are termed conditional variables or moderators (Frankfort-Nachmias and Nachmias 1996).

From previous empirical studies in Tanzania and Kenya, we know that older entrepreneurs may have better access to information and thus tend to perform better than younger ones (Kimuyu 2001, Jensen and Kristiansen 2004). Several empirical studies from Africa indicate that gender may have an impact on access to information and thus on business adaptability and entrepreneurial success. Women generally have a weaker performance in business (Chitsike 2000, Nchimbi 2000, Rutashobya 2001, Mandel 2002). Previous studies from Tanzania have found that larger firms achieved higher growth rates than smaller ones (Olomi 2001) and that micro enterprises are more vulnerable in comparison to larger-scaled enterprises (Satta 2003). Business location can possibly affect business adaptability in several ways. Increasing distance from main centres of information and business dynamics may have a negative impact on adaptability. However, distance and poorly integrated spatial systems may also bring a short-term net benefit to local producers close to local markets. Studies from other developing regions have found that a lack of new ideas and dynamics may be compensated by the avoidance of aggressive sellers from other regions and thus an omission of subsequent trade leakages (Ananda 1998, Tylor and Ynez-Naude 2002). These four conditional variables will be analysed together with each of the five main independent variables in section 5.

Based on the foregoing theoretical discussion, the following research model (figure 1) is presented as the basis for our empirical analyses.

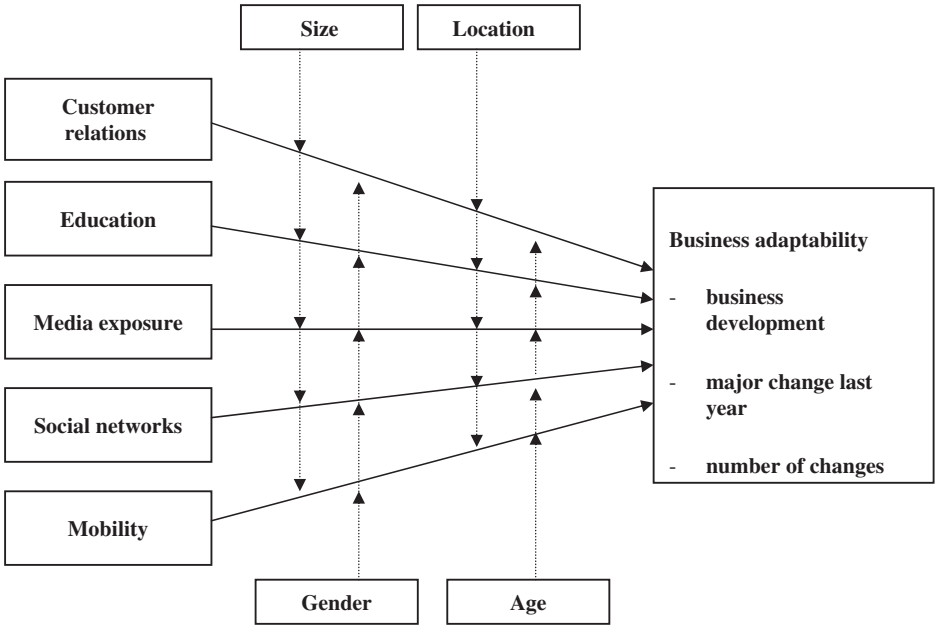

Figure 1. The research model.

4. Research design and methodology

The empirical study reported in this paper investigated information flows and business changes in small-scale garment and woodworking enterprises at various levels of centrality in Tanzania towards the end of 2002. A questionnaire was administered face to face with 392 owner-managers in a sample of small businesses (less than 50 employees). In the following, they are equally termed entrepreneurs and business owners. Most of the businesses fall within the category 'cottage industries', operated in humble premises, with simple technology, and with less than ten employees.

The sampling of enterprises was made within four administrative regions, Dar es Salaam, Morogoro, Iringa and Mbeya. A map of Tanzania is shown in figure 2. Tanzania's system of local administration is based on 20 regions on the mainland (excluding Zanzibar), an average of five districts within each region, and various numbers of wards within each district. We aimed for approximately 100 respondents from each region. Apart from in the capital city, we tried to find one-third of the targeted respondents at each of three levels of centrality: the regional capital, a major district town, and rural wards within that district. Based on previous mapping of the study areas, respondents could be selected to get an even distribution from both trades within these particular areas. If the owner of a selected enterprise was busy with customers, we agreed to come back after some time. If he or she was unavailable or reluctant to answer, we moved on to the nearest business. Very few entrepreneurs refused to respond (a non-response rate of less than 3%). Only in the capital city did we face a problem of selected enterprises where the owners were absent. However, we had approximately one week at our disposal for data collection in Dar es Salaam and were able to return for the interview on another day. In district towns, a limited total number of garment and woodworking enterprises could bring the number of sampled respondents under the target, as in Kilosa town in the Morogoro region.

Figure 2. Map of Tanzania.

In the capital city of Dar es Salaam, the sampling of 89 respondents was made randomly within nine purposely-selected wards, mostly centrally located, with approximately equal numbers in the three districts of Kinondoni (north), Ilala (centre) and Temeke (south). In the region of Morogoro, we interviewed 33 enterprises in the regional capital, Morogoro town. A sample of 16 entrepreneurs was made in the district town of Kilosa, while we included 53 randomly-selected respondents from a sample of rural wards in the Kilosa district. Similarly, in the region of Iringa, 37 enterprises were selected within the regional capital of Iringa, 25 in the district town of Mafinga, and 34 from rural wards in the Mufindi district. Also in the Mbeya region a similar procedure was followed: 41 respondents from wards in the regional capital town of Mbeya, 32 from the district town of Tukuyu in Rungwe district, and 32 from rural wards in the same district.

In the three regional towns, information on the total population of enterprises in the selected businesses could be collected from municipal trade offices and ward officers. This allowed a random selection of enterprises from both the formal

Table 1. Distribution of respondents by regions and levels of centrality ($n = 392$).

	Village	*District town*	*Regional town*	*Capital city*
Morogoro	53	16	33	–
Iringa	34	25	37	–
Mbeya	32	32	41	–
Dar es Salaam	0	0	0	89

(registered and licensed enterprises) and informal sectors of the two business lines within three to four selected wards. However, all interviews were made without the presence of any government officials. In Dar es Salaam and at the lower levels of centrality (district towns and rural wards/villages), a similar procedure was difficult to follow, simply because trade and ward officers did not keep reliable lists of enterprises within their regions of authority. Alternatively, the wards were purposely selected and the enterprises were randomly selected after an initial mapping of the selected locations. The distribution of respondents by regions and levels of centrality is shown in table 1.

Dar es Salaam city with its population of 2.5 million is the commercial and industrial centre of Tanzania. It is *de facto* also the political capital and the centre of business-related information and competence. The selected upcountry regional centres, Morogoro, Iringa and Mbeya, are connected to Dar es Salaam by the Tanzania–Zambia highway at respective distances of about 200, 500 and 800 km to the southwest.

Morogoro region has one of the richest agricultural potentials in the country and in the past enjoyed a coveted level of industrial clustering around the capital city. Following the economic crisis of the late 1970s and the early 1980s, most of the larger-scaled factories closed down. Morogoro town has a population of approximately 230 000, including a high number of retrenched people. Commercial and cultural interaction with Dar es Salaam is close. Kilosa district is one of six districts within the Morogoro region and has a population of half a million. The town of Kilosa is rather stagnant, with its former sisal plantations and cotton farming glory vivid in the rural surroundings.

The Iringa region is situated in the southern highlands and divided into seven administrative districts. The region is rich in agriculture and forestry. It is nationally famous for the production of tea, maize and vegetables. Iringa town has a population of around 150 000. Owing to an abundant wood supply, woodworking and furniture businesses seem to be more developed than tailoring in the area. Mafinga is the capital of Mufindi district, which has a population of 300 000. Rural people are peasants or workers in tea plantations.

Mbeya is also in the southern highlands of Tanzania, bordering Zambia and Malawi on its west and south. The region is rich in agricultural farming, particularly of maize, coffee, tea and bananas. It is divided into eight administrative districts. Mbeya town has a population of close to 300 000. As a commercial node, Mbeya has an active small-scale business sector, also engaged in cross-border trade with neighbouring Malawi, Zambia and Congo. Tukuyu is the administrative centre of Rungwe district, which has a population of 300 000. Its people are predominantly farmers.

The maximum number of cases in our analyses is 392. Several questionnaires had missing data on some variables and the valid number of cases is therefore normally lower. No systematic pattern can be found in the dispersion of missing data. The questionnaire was developed in English and translated into Swahili before conducting the interviews. The translation was checked by an independent re-translation into English. The questionnaire was tested and moderated twice before the final version was decided. From the interviews, which took around half an hour to complete, mainly details about changes in business and access to information were collected. All interviews were conducted at the business premises of the entrepreneurs. All respondents were formally assured of full anonymity. Emphasis was put on equalizing the interview settings by introducing the study in the same way. No systematic differences are found in data collected by the various enumerators.

The selection of variables, measurement methods, the composition of the questionnaire, and the research model are based on a series of previous qualitative and case studies of entrepreneurs in the garment and woodworking businesses in Tanzania (Kristiansen and Mbwambo 2003, Kristiansen and Ryen 2003, Mbwambo 2003, Jensen and Kristiansen 2004, Kristiansen 2004a, b). The content validity of the research instrument has thus been subjectively assessed. Most of the enumerators employed in the survey have participated in the previous studies and were well acquainted with research questions and the selected business lines and geographical contexts.

In the empirical analyses, five main independent variables are applied and they are operationalized as follows: customer relations are the numbers of customers that the entrepreneurs serve (by taking an order or selling) in a typical day. The entrepreneurs' education is either measured as the number of years in schooling (interval) or as an ordinal variable with four scales (Std7 or lower, Form IV, Form VI, and higher education). Media exposure is the number of media types (newspaper, radio, television and the Internet) that the respondents report to be in regular use (at least once a week) as sources of business-related information. Social networks are measured as the total number of business-related inter-personal contacts (consisting of family and friends, colleagues and business partners, and religious affiliations), which the entrepreneurs report have contributed by supplying information for change in their businesses over the last year. Mobility is the number of trips that entrepreneurs make out of their region in a typical year. Four conditional variables are included in the analyses: age, gender, business size, and location. Business size is measured as the number of employees in the enterprises. Location is considered both according to region and level of centrality. We apply three different dependent or adaptability variables. 'Business development' is either growing, stagnant or declining, based on the entrepreneurs' own perceptions of their turnover in the current and the previous years. The variable 'major change last year' represents the respondents 'yes' or 'no' to the question: Did you make any changes during the last year that increased your business profitability? The last dependent variable is the actual number of important changes that the entrepreneurs reported in last year's business activity.

Measures of the five independent and two of the four conditional variables are all based on the respondents' answers during the interviews. Based on previous case studies and observations while conducting this survey, we found no specific reason to mistrust the respondents' replies on these issues. All questions were presented in the same way to all respondents, with necessary elaborations on how to count the measures. The predictive validity of the business adaptability variables is more uncertain.

The three dependent variables are measured subjectively and respondents might have had reasons to distort reality, particularly in 'business development'. Some respondents may have been reluctant to report on business growth, as government tax is based on turnover while others may have been too eager to report on the success of their endeavours. This variable also has limited face validity as related to business adaptability. Growth or stagnation may be subject to general market development trends and not only to the ability to adapt. We consider that the validity and reliability of the two remaining dependent variables is higher. Measures of 'major change last year' and 'number of changes' are quite easy to recall, as they are limited to the last year of business operation. We find no reason why respondents should purposely avoid telling the truth. Formulation of these questions was thoroughly prepared through previous in-depth interviews and pre-studies to make sure that respondents caught the same meaning. The number of changes was specified on various types (product, fashion, etc.) to make it easier to recall. Comparing these two, we regard the reliability of 'major change last year' as highest. The number of changes is more dependent on subjective judgements on what is actually a significant change. As previously mentioned, in this type of quantitative research we regard the three subjective judgements in combination as the best possible measurement. The administrative and accounting systems of cottage industries in Tanzania do not allow for objective measures or external criteria for predictive validity assessment.

Another general methodological challenge is associated with the internal validity of the research design. One specific problem is related to the disparity between individual and firm level analyses. All independent and two of the conditional variables are measured at the individual level, while the dependent variables are measures at the firm level. As most enterprises are small (74% have three or less employees), this problem is limited. Still, the analyses should take into consideration that employees apart from the owner-manager might contribute to business adaptability by their education, social networks or mobility, for instance. Another methodological problem is related to the fact that the independent variables may not cover all aspects of matters that we want to measure (content validity). One example is mobility, which may play a role for an enterprise in the way that people apart from the owner travel and bring in new business ideas, fashions and technologies to the context within reach of the entrepreneur. The traveller may be a customer or an associate in the entrepreneur's social network.

In the statistical analyses we apply bivariate correlation analyses, using Pearson's coefficient when both variables are on interval scales and Spearman's rho when both variables are on ordinal scales. Interval values have in some cases been considered as ordinal values for correlation analyses (e.g. media exposure when correlated with business development), and in some cases ordinal values have been treated as nominal values for cross-tabulation analyses with another nominal value (e.g. business development when associated to gender). Cross-tabulation (Phi coefficient) is used for analysing the association between variables measured in nominal values. A *t*-test is used to compare means between two groups, while one-way ANOVA is used to compare means among more than two groups. When any significant difference is found we deploy Tukey's significant difference test in *post hoc* multiple comparison to see significant differences between specific groups. In the following statistical analyses, only significance levels lower than 0.05 ($p < 0.05$ and $p < 0.01$) were accepted.

5. Findings

Some 53.1% of our respondents are in the garment industry, while the remaining 46.9% are in the carpentry business. The average age of the enterprises is 8 years, and the mean number of employees is 3.2. The average age of the entrepreneurs is 33 years, ranging from 16 to 78 years. A total of 18% of them are females and 82% are males. Descriptive statistics are depicted in table 2.

Almost half (48.5%) of the respondents reported that their businesses were growing, while 51.5% said that their business was either stagnant (38.9%) or declining (12.6%). More than one-third (35.2%) of the entrepreneurs had made changes during the last year that had increased their business profitability. The remaining (64.8%) did not report any major changes. The average number of changes over the last year is 3.2 (including zero for those who did not report any major changes). Generally, males report a significantly higher number of changes in comparison to females (means 3.6 and 1.4, respectively). There is no significant difference on any of the adaptability variables at any age cut-off points. The share of enterprises that made profitable changes last year is highest in the Morogoro region (47.1%), closest to the capital city, and lowest in the most distant Mbeya region (24.8%).

For the 138 enterprises reporting changes with a positive impact on profitability last year, the average number of changes is 9.4 (the standard deviation is high, 13.7). Most changes occur in design (3.5 changes per year) and products (3.0 changes per year),

Table 2. Descriptive statistics.

Variable	*Mean (SD)*	*n*	*%*
Age (years)	33.08 (10.39)		
≤33 years		224	57.1
>33 years		168	42.9
Gender			
Female		69	17.6
Male		323	82.4
Company size (no. of employees)	3.21 (4.67)		
≤3 employees		288	74.0
>3 employees		101	26.0
Customer relations			
Number of customer served per day	3.79 (3.69)		
≤4 customers		270	75.21
>4 customers		89	24.79
Education (years in schooling)	7.97 (1.93)		
Standard 7		296	78.3
Form IV		69	18.3
Form VI		9	2.4
University		4	1.1
Media exposure			
Newspaper (no. of entrepreneurs)		170	56.7
Radio (no. of entrepreneurs)		168	56.2
TV (no. of entrepreneurs)		133	44.5
Internet (no. of entrepreneurs)		10	3.30
Social networks	5.81 (9.86)		
≤6 persons		300	76.50
>6 persons		92	23.50
Mobility	2.74 (5.32)		
≤3 journeys per year		318	81.12
>3 journeys per year		74	18.88

Table 3. Main correlation values (all cases).

	Business development	*Number of changes*
Customer relations	0.12*	0.05
Education	0.15**	0.03
Media exposure	0.08	0.12*
Social network	0.11*	0.20**
Mobility	0.11*	0.17**

*$p < 0.05$, **$p < 0.01$.

while relatively few modifications are reported in equipment (technology) or managerial techniques (supervision) (approximately 1.5 changes per year). Changes are normally quite small, such as a new style of gown collar or another form of bedside table.

We find significantly higher scores on the variables 'major change last year' and 'number of changes' in the carpentry industry compared to garments businesses. There is no significant difference between the two sectors with regard to business development.

In the following, we analyse statistical associations between the main independent variables (customer relations, education, media exposure, social networks, and mobility) and the dependent, adaptability variables (business development, major change last year, and number of changes). Correlation coefficients for two of the dependent variables are depicted in table 3. Subsequently, we also discuss the impact of the conditional variables (age, gender, size, and location) under each of the independent variable headlines.

5.1 Customer relations

On average, the entrepreneurs in our survey serve 3.8 clients per day. The number is significantly higher for Dar es Salaam as compared to the village level of centrality, 4.8 and 3.4, respectively. The average time spent per customer in one business transaction is 20 minutes. As many as 76.8% of customers are reported to live in the vicinity of the entrepreneurs.

As can be seen from table 3, the variable 'customer relations' is significantly correlated with business development ($r = 0.12$, $p < 0.05$), while not with number of changes. In addition, customer relations are significantly higher among those enterprises who made profitable changes last year compared with the non-changers ($t = -2.93$, $p < 0.01$). The average number of customers served in a typical day is 4.6 among changers, compared to 3.3 for non-changers. Bringing the conditional variables into the analyses reveals additional relations and differences. Business development is more strongly correlated with the number of customers for the smaller enterprises and for those located in the Mbeya region. We also find that the difference between changers and non-changers is greater among males and among entrepreneurs in regional towns and the capital city. For instance, the average number of customers served in a day is 6.3 for entrepreneurs in Dar es Salaam who made profitable changes last year, compared to 4.0 for those who did not.

5.2 *Education*

As can be seen from table 3, education is positively and significantly correlated with business development when all cases are analysed together. By bringing in the conditional variables, we find that business development is more strongly affected by education for older and female entrepreneurs, and for smaller enterprises (<3 employees) and those located in the capital city of Dar es Salaam. For the whole sample, there is no significant correlation between education and the number of changes. For female entrepreneurs, however, this correlation is quite strong ($n=67$, $r=0.34$, $p<0.01$). Also for enterprises in regional towns, we find a significant correlation between education and number of changes ($n=105$, $r=0.19$, $p<0.05$).

Analysing adaptability as a categorical variable ('major change last year'), we make a means comparison (using Chi-square test for education as an ordinal variable and independent-samples-*t*-test for measures on an interval level). We find a significantly ($p<0.05$) higher level of education for those who made profitable changes last year. Particularly for females, this difference is substantial. Average number of years in schooling is 9.8 for female entrepreneurs who made changes and 7.6 for the non-changers ($n=67$, $t=-3.15$, $p<0.01$). The difference in levels of education between changers and non-changers is also substantially larger in the capital and regional towns compared with the lower levels of centrality.

5.3 *Media exposure*

Media exposure is positively and significantly correlated with the number of changes being made for the whole sample ($r=0.12$, $p<0.05$). This correlation is stronger in the Mbeya region ($n=105$, $r=0.25$, $p<0.01$). There is no significant correlation between media exposure and business development in all cases. However, this correlation is significant and positive for the female entrepreneurs ($n=53$, $r=0.30$, $p<0.05$). Analysing media exposure using independent samples *t*-test, we also find that there is a significant difference between those who made profitable changes and those who did not ('major change last year') ($t=-2.39$, $p<0.05$). Differences are bigger for females, smaller enterprises, and for entrepreneurs in regional towns. Among the 109 enterprises in regional towns, for instance, changers on average obtained weekly business information from 2.6 different sources, mostly newspapers, radio and television, while the comparable average for non-changers was 1.9.

Figure 3 depicts media exposure as being remarkably equally distributed among the four levels of centrality, although somewhat higher in the regional centres. Although the Internet is generally unavailable at the village level, the use of other media is actually higher at this level than in district towns and Dar es Salaam. The most predominantly important type of information obtained from the use of media is related to fashions and design, which is followed by information on products.

5.4 *Social networks*

The share of social contacts who live in the vicinity is relatively high (family and friends: 70.5%; colleagues and business partners: 79.6%; religious affiliations: 58.2%). Social networks are more dominant contributors to access of market information in

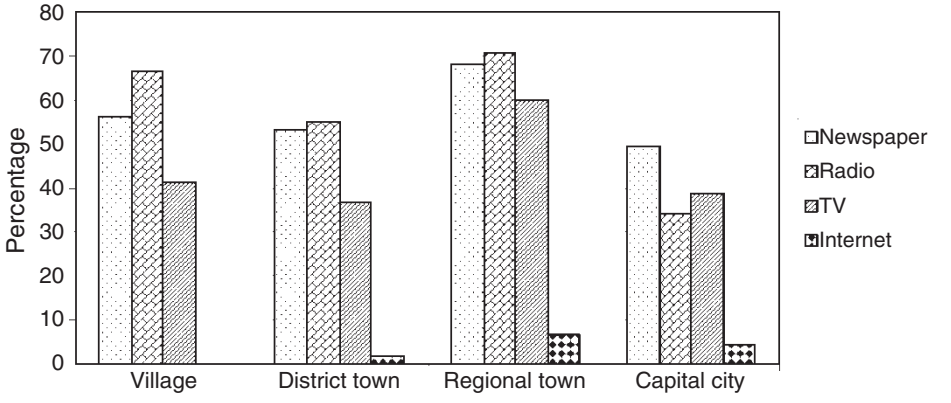

Figure 3. Entrepreneurs' use of media (percentage) at the four levels of centrality.

the capital city compared to other levels of centrality, while entrepreneurs on the lower levels emphasize the value of information on fashions, resources, equipment and supervision obtained through social networks.

The size of social networks is significantly positively correlated with business development ($r = 0.11$, $p < 0.05$) and the number of changes being made ($r = 0.20$, $p < 0.01$) (table 3). Social networks are also significantly more extensive among those who made profitable changes last year compared with the non-changers ($t = -2.08$, $p < 0.05$). The average size of social networks is 7.3 among changers, compared to 5.0 among non-changers. By bringing the conditional variables into the analyses, additional relations are revealed. The number of changes being made is more strongly correlated with the extension of social networks for younger entrepreneurs, for the larger enterprises, and for those in district towns and in the Mbeya region. In addition, we find that the difference in size of social networks among changers and non-changers is larger among young entrepreneurs, females, and enterprises in Mbeya. Females who made changes, for instance, had social networks comprising 8.1 persons, compared to 2.6 for the non-changers.

Figure 4 illustrates the various kinds of information obtained from different sources, including customers, media and social networks (family, colleagues and religious affiliations). The percentage figures on the vertical axis are calculated on the basis of the number of respondents who valued the individual information sources as relevant for their business development. As can be seen from figure 4, customers are especially valued for their inputs to developing fashions and design.

All these sources of information are actually regarded as most important for the respondents' access to information on fashions and design. Colleagues and business partners are the most important sources of information on products, resources and equipment. Religious networks, typically stretching geographically wider, are regarded as a valued source of information especially on markets.

5.5 Mobility

Mobility shows a significant positive correlation with business development ($r = 0.11$, $p < 0.05$) and the number of changes being made ($r = 0.17$, $p < 0.01$) (table 3). There is also a significant difference in mobility between those who made profitable changes

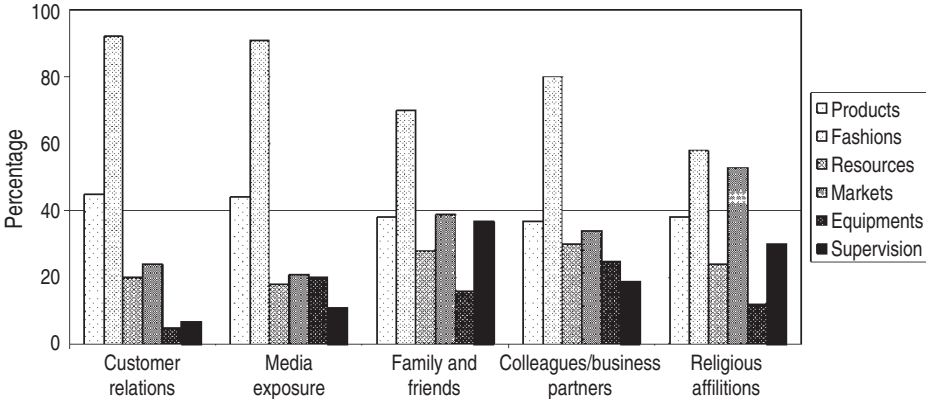

Figure 4. Information sources and types of business information. (Family and friends, colleagues and business partners, and religious affiliations are all included in the social networks variable.).

Table 4. Correlations between mobility and number of changes.

	n	*r*	*P*
All samples	392	0.17	0.01
Age			
≤33 years	224	0.25	0.01
>33 years	–	–	–
Gender			
Male	323	0.19	0.01
Female	–	–	–
Size			
≤3 employees	–	–	–
>3 employees	101	0.53	0.01
Centrality			
Village	–	–	–
District town	73	0.74	0.01
Regional town	–	–	–
Capital	–	–	–
Region			
Morogoro	–	–	–
Iringa	–	–	–
Mbeya	105	0.55	0.01
Dar es Salaam	–	–	–

(–) means not significant.

and those who did not ($t = -2.39$, $p < 0.05$). The mean number of trips out of one's region per year is 3.7 for those who made substantial changes and 2.2 for those who did not ($n = 392$). Rather surprisingly, the average female mobility is as high as that for males.

Again, conditional variables add to our understanding of the value of mobility for business changes. The correlation between mobility and number of changes is higher for younger than for older entrepreneurs, stronger for males than for females, and much higher for larger enterprises compared to smaller, and for those located in district towns and the Mbeya region when compared to other levels of centrality and other regions. These correlations are shown in table 4.

Also when comparing means between groups (independent-samples *t*-test on the variable 'major change last year'), we find that mobility makes the most significant impact on males and larger enterprises. For instance, business owners in larger enterprises who made profitable changes last year made 5.1 trips out of their region, compared to 1.9 for those who made no changes.

A summary of main findings from the bivariate analyses are presented in table 5. As can be seen, all the five hypotheses are verified. We have found statistically significant associations between the five information-related independent variables and at least two of the three dependent adaptability variables. The conditional variables (age, gender, size and location) are also found to have impact on most relations between information and adaptability variables.

5.6 Independent variables combined

Analysed together in regression analyses, our independent variables only weakly explain variances in business adaptability for the whole sample (4–6%). However, when conditional variables are taken into account, regression analyses show stronger explanatory power. For instance, 64% of the variance in the number of changes among all sampled enterprises in the Mbeya region is explained by independent variables (Adj $R^2 = 0.64$, $p < 0.01$), mostly by social capital and mobility. Similarly, 41% of the variance in number of changes among enterprises with more than three employees is explained by independent variables together in a regression analysis (Adj $R^2 = 0.41$, $p < 0.01$).

6. Concluding discussion

Our sample comprising 392 tailoring and woodworking entrepreneurs in Tanzania is dominated by men (82%), and male entrepreneurs are also significantly more adaptive than female business owners. The average age of the entrepreneurs is 33 years and age does not seem to have any impact on business adaptability. Surveyed enterprises are small, 3.2 employees on average, and those above average size are somewhat more likely to be adaptive. Maybe the most interesting observation in this study is the fact that less than 13% of the entrepreneurs characterize their businesses as declining. Almost half of the business owners (48.5%) report that their enterprises are growing, and more than one-third (35.2%) made changes last year that increased their profitability. Profitable adaptations occur mostly in products and design, and customers and media represent the major sources of information for adaptability in these fields. Changes are mostly minor, however, and rarely comprise substantial adaptations of technology, marketing or management.

In our study, adaptability is measured subjectively. Respondents may have various motives for reporting that their businesses are growing or declining. In spite of this, we assume that the three adaptability variables combined give a reliable picture of competitive status and strength in the sampled enterprises. Based on previous case studies, the content validity of the research instrument has been subjectively assessed and found to be satisfactory. The internal validity of the research design has some weaknesses, however, that need to be taken into account in the interpretation of findings.

Table 5. Summary of statistical findings.

Hypothesis	*Independent variable*	*Dependent variable*	*Status (all cases)*	*Moderators*	*Comments*
H1	Customer relations	Business development	Confirmed $r=0.12$ $p<0.05$	Size and location	Effect stronger for smaller and Mbeya
		Major change last year	Confirmed $t=-2.93$ $p<0.01$	Gender and location	Effect stronger for males, regional towns and Dar es Salaam
		Number of changes	Not confirmed	–	–
H2	Education	Business development	Confirmed $r=0.15$ $p<0.01$	Age, gender, size and location	Effect stronger for older, females, smaller, and Dar es Salaam
		Major change last year	Confirmed $t=-2.48$ $p<0.05$	Age, gender, size and location	Effect stronger for older, females, larger, and regional towns
		Number of changes	Not confirmed	Gender and location	Effect only for females and regional towns
H3	Media exposure	Business development	Not confirmed	Gender	Effect only for females
		Major change last year	Confirmed $t=-2.29$ $p<0.05$	Gender, size and location	Effect stronger for females, smaller, and regional towns
		Number of changes	Confirmed $r=0.12$ $p<0.05$	Location	Effect stronger in Mbeya
H4	Social networks	Business development	Confirmed $r=0.11$ $p<0.05$	Gender	Effect stronger for males
		Major change last year	Confirmed $t=-2.08$ $p<0.05$	Age and gender	Effect stronger for younger and females
		Number of changes	Confirmed $r=0.20$ $p<0.01$	Age, size and location	Effect stronger for younger, larger, district towns, and Mbeya
H5	Mobility	Business development	Confirmed $r=0.11$ $p<0.05$	Age, gender, size and location	Effect stronger for older, males, smaller, villages, and Morogoro
		Major change last year	Confirmed $t=-2.39$ $p<0.05$	Age, gender, size and location	Effect stronger for younger, males, larger, and regional towns
		Number of changes	Confirmed $r=0.19$ $p<0.05$	Age, gender, size and location	Effect stronger for younger, males, larger, district towns, and Mbeya

The five hypotheses set forth in this paper are all confirmed by statistical associations that are significant at the 0.05 level or lower. However, most correlation coefficients are low when the whole sample of respondents is analysed. Statistical associations between information and adaptability variables are generally much stronger when the conditional variables (age, gender, size and location) are taken into account.

Hypothesis 1, proposing positive statistical associations between customer relations and business adaptability, is verified for the whole sample as regards the adaptability variables 'business development' and 'major change last year'. Major moderators are gender and location. Contacts with customers tend to be more important for business adaptations for male entrepreneurs and for enterprises at higher levels of centrality (regional and capital towns). Male entrepreneurs rely more on information from their customers for market development compared to females, and customer relations are apparently more important in areas where competition among enterprises are higher.

Hypothesis 2, stating that entrepreneurs' level of education is associated with business adaptability, is confirmed in the way that entrepreneurs with higher education are more inclined to run growing enterprises and businesses that made profitable changes last year. The positive effect of education is stronger for women, for older entrepreneurs, and for enterprises located in larger towns (regional centres and the capital city of Dar es Salaam). The effect of education on adaptability is negligible at lower levels of centrality (in district towns and villages). For women in our survey, who have the same average number of years in school as men, longer education probably compensates for other setbacks related to gender, such as limited media exposure. In addition, education is probably more important in the larger towns with more educated entrepreneurs, more competition, and higher exposure to the modern sector of the economy.

Hypothesis 3, expecting positive statistical associations between media exposure and business adaptability, is confirmed in the way that the number of changes is higher for entrepreneurs who use more types of media for obtaining information. Media exposure is also significantly higher for business owners who made profitable changes last year. The effect of media exposure tends to be higher for female entrepreneurs, who are generally less exposed to media compared to male business owners. Information through media counts more for businesses in the most remote Mbeya region and thus seems to compensate somewhat for disadvantages of distance. The same is generally the case in regional towns, where media exposure is also higher than at other levels of centrality.

Hypothesis 4 expects that the extension of business owners' social networks is positively associated with their business adaptability. This proposition is confirmed for all adaptability variables. Younger entrepreneurs in particular seem to gain from extensive social networks, and thriving entrepreneurs probably learn from extensive contacts particularly with colleagues and business partners. Correlation coefficients are also especially high for social networks and the number of changes for enterprises with more than three employees ($r = 0.53$), in the Mbeya region ($r = 0.76$), and in district towns ($r = 0.80$). The regional differences in the role of social networks may be explained by the fact that entrepreneurs in Mbeya and district towns gain more from their religious affiliations, which are generally more geographically wide-ranging and may thus compensate for remoteness and limited mobility.

Hypothesis 5, expecting that mobility is positively associated with business adaptability, is confirmed for all adaptability variables. Mobility has a higher positive impact on male entrepreneurs' adaptability compared to that of females. The positive impact of mobility is also significantly higher in the woodworking business than in the garment industry, where all the female entrepreneurs in our sample are found. Mobility tends to be more important for younger entrepreneurs and owners of larger enterprises. Moreover, mobility is of special importance for business owners in the most remote Mbeya region. Travelling out of one's region to get new information is of little importance for entrepreneurs in Dar es Salaam, where the propensity to travel is also very low compared to the other areas.

Our statistical analyses point towards the need for further research on conditions for business adaptability and local entrepreneurship in economically poor contexts. Prevailing uncertainties about causal relationships between independent and dependent variables in our study may probably best be researched by systematic, comparative case studies and participant observation. Male and female entrepreneurs in selected business categories and age groups should be watched in daily activities and interviewed in-depth about the role of information and knowledge for the development of their competitive strength. More interpretations of statistical findings can then be made.

Still, the main objective of this paper has been fulfilled. Relevant bases and sources of information for cottage industries' adaptability and survival in Africa have been analysed. It was found that remarkably few of the surveyed businesses are declining and many are in a process of profitable changes. Our study reveals that information for adaptation is obtained from various sources. Customers, media, and social networks all matter. Business adaptability is also facilitated by entrepreneurs' education and mobility. However, differences in the relevance of these factors among business locations and size categories, and among gender and age groups point in the direction of fragmented markets for garments and woodworking in the Tanzanian economy. The findings that education and mobility have no significant impact on enterprises at the village level, for instance, correspond to the general impression that the modern sector of the economy has penetrated local levels only to a limited extent. Entrepreneurs can survive and even prosper using pedal-driven sewing-machines and hand-saws, even though they might possess little education or are unable to move out of their regions to pick up new ideas and knowledge. Profitable business adaptations can be made based on regular contacts with customers, friends and colleagues in the vicinity. For companies located in towns far from centres of economic activities and business innovation, the disadvantages of distance may be compensated by enhanced media exposure, more extensive social networks, and higher mobility, as is the case in the Mbeya region. The markets at the village levels are typically local, and competition from external businesses is still limited.

Business adaptation, survival and even growth in cottage industries can be made without significant productivity improvements or market expansion. Few changes are actually made in technology, business management, or market areas. Circulation of information in these fields is limited and the transition to new production techniques, product qualities and markets is inhibited. Limited information on business alternatives impedes a shift into potential production with higher profitability and growth prospects. Levels of x-inefficiency are maintained high and imitative businesses still dominate over innovative entrepreneurship. With a more aggressive competition from external producers in the modern sector, the localized markets can hardly be

maintained and even small-scale entrepreneurs will most probably have to search for additional sources of information for survival and progress.

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