Regional Project on Enterprise Development (RPED)
Ghana Manufacturing Enterprise Survey (GMES)
Waves I – V

Background Information on Use of Dataset

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Introduction

The objective of this background information is to provide potential users of this survey data set with some basic guidelines and explanations which will facilitate their ability to utilise this resource for their own research or other purposes.

The relevant material is a comprehensive panel data set on a sample of firms within the Ghanaian manufacturing sector. This data was collected in five rounds over the period 1992 to 1998. The first three rounds were annual surveys, referred to here as Waves I – III, as part of the Regional Program on Enterprise Development (RPED) organised by the World Bank. The fourth and fifth rounds of the data each cover two year periods. The data was collected by a team from the Centre for the Study of African Economies (CSAE), University of Oxford, the University of Ghana, Legon and the Ghana Statistical Office.

The original sample of 200 firms, which were first surveyed in 1992, was drawn on a random basis from firms contained in the 1987 Census of Manufacturing Activities. The firms constituted a panel which was intended to be broadly representative of the size distribution of firms across the major sectors of Ghana's manufacturing industry. These sectors include food processing, textiles and garments, wood products and furniture, metal products and machinery. It has been possible to obtain data over the waves for the majority of the original sample of firms, but, where necessary, firms that have dropped out of the survey (for a variety of reasons) have been replaced in the sample by similar firms.

The data collected over the first five waves of the survey, which are made available here, give the following information:

- firm level information - relating to the years 1991 to 1997;
- for each firm, information on a sub-sample of their workers & apprentices - relating to the years 1992 to 1998;

The questionnaire for Wave 4 contains firm-level information for the years 1994 and 1995 and individual worker information for the years 1995 and 1996. This is due to the fact that the questions for earning refer to the earning at the time the survey was conducted while for the firm level information we sought to collect information for the previous calendar years. Similarly the questionnaire for Wave 5 contains firm level information for the years 1996 and 1997 and individual data for the years 1997 and 1998. These differences are important for deflating the variables as inflation has been substantial over the period. 7

This dataset is being made available to potential users in two ways: firstly, it has been added to the collection of datasets held by The Data Archive at the University of Essex (tel: 01206 872001); secondly, it can be downloaded from the CSAE's website at the following address http://www.csae.ox.ac.uk/.

List of Files & their Contents

For ease of reference, the following files and folders are included in this release with a brief description of their contents. Please refer to the following sections for a more detailed description of the files, how they link together and how they can be used.

Name of File	Description of Contents
Wave 1 (folder)	Subdirectory containing a series of SAS transport files (*.dat) which contain the raw data collected from Wave 1 of the survey[1];
Wave 2 (folder)	Subdirectory containing a series of SAS transport files (*.dat) which contain the raw data collected from Wave 2 of the survey;
Wave 3 (folder)	Subdirectory containing a series of SAS transport files (*.dat) which contain the raw data collected from Wave 3 of the survey;
Wave 4 (folder)	Subdirectory containing a series of SAS transport files (*.dat) which contain the raw data collected from Wave 4 of the survey;
Wave 5 (folder)	Subdirectory containing a series of SAS transport files (*.dat) which contain the raw data collected from Wave 5 of the survey;
inv.dat	SAS transport file which contains additional investment data collected during wave 1 of the survey;
w1quest.pdf	File containing a scanned version of the Wave 1 questionnaire showing the coding structure utilised in the data entry programme;
w2quest.pdf	File containing a scanned version of the Wave 2 questionnaire showing the coding structure utilised in the data entry programme;
w3quest.pdf	File containing a scanned version of the Wave 3 questionnaire showing the coding structure utilised in the data entry programme;
w4quest.pdf	File containing the Wave 4 questionnaire showing the coding structure utilised in the data entry programme;
w4labour	Wave 4 appendices to labour market questionnaire: surveys for sub-samples of workers and apprentices
w5quest.pdf	File containing the Wave 5 main questionnaire showing the coding structure utilised in the data entry programme;
w5labour.pdf	Wave 5 workers and apprentices questionnaire
w5newfirm.pdf	Wave 5 new firms supplement
w5followup.pdf	Wave 5 follow-up questionnaire
common.sas	SAS program file generating firm level variables that are common across waves – including dummy variables for firm sector, location and size;
common.dat	SAS transport file containing the permanent dataset of variables and observations generated by the common.sas program file;
genfirm.sas	SAS program file generating general firm variables - including output,

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[1] These transport files will need to be converted back to SAS data files (*.sd2) before they can be utilised with the SAS program files. See convert.sas for an example of the programming commands necessary to convert SAS transport files to data files and vice versa.

employment levels, wage rates, input costs, capital stock and investment levels;

genfirm.dat	SAS transport file containing the permanent dataset of variables and observations generated by the genfirm.sas program file;
finance.sas	SAS program file generating financial variables – including both formal & informal sector borrowing;
finance.dat	SAS transport file containing the permanent data set of variables and observations generated by the finance.sas program file
invest.sas	SAS program file generating investment variables - including sources of financing
invest.dat	SAS transport file containing the permanent dataset of variables and observations generated by the invest.sas program file;
convert.sas	SAS program file which contains some examples of the programming necessary to convert data files between their transport format (*.dat) and their usable format in SAS (*.sd2). The data files included with this dataset will need to be converted in this way in order to run the SAS programs successfully;
investnote.pdf	Word file containing a further explanatory note on the investment data and investment-related variables generated in invest.sas;
workernote.pdf	Word file containing a further explanatory note on the worker and apprentice level data and the variables generated in the worker.sas and appren.sas program files;
production.pdf	Word file explaining how to run the basic production function for the data set.
datanotes.pdf	Word file which provides notes on the construction of a data set for the human and physical capital stocks of the firms and describes how real value-added can be measured using both output and input price deflators.

Description of Questionnaire(s)

The dataset presented here has been extracted from a detailed questionnaire conducted with the owners/ senior managers and, for relevant sections, workers of the sampled manufacturing firms. The original questionnaire was designed by a team from the World Bank.

Over the waves of the survey, the structure of the questionnaire and the range of questions included have evolved in the light of field experience and in response to emerging research issues. Outlines of each of the questionnaires are included with the material made available here.

The overall questionnaire has been divided into a number of sections, grouping questions related to different aspects of firm-level structure and performance and also a section of supplementary labour market information gathered from interviews with a sample of workers within each firm.

These sections are organised as follows in the Waves III - V questionnaires:

Survey Sections (Wave III)

0.   Firm Identification & Contact Details; Visit Details[2]
1.   Entrepreneurship Questionnaire
2.   General Firm Questionnaire
3.   Competition Questionnaire
4.   Technology Questionnaire
5.   Labour Markets Questionnaire
6.   Financial Markets Questionnaire
7.   Infrastructure Questionnaire
8.   Regulation Questionnaire
9.   Adjustment Questionnaire
10.   Investor Confidence Questionnaire
11.   Business Support Services Questionnaire

Appendix to Labour Markets Questionnaire:
Survey for a Sub-Sample of Workers & Apprentices

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[2]   Please note that information on the names of firms & persons interviewed and their contact details have been excluded from the data files made available here.

Survey Sections (Wave IV)

1. General Information Sheet
2. Entrepreneurship Questionnaire
3. General Firm Questionnaire
4. Investment Questionnaire
5. Technology Questionnaire (These questions were not asked)
6. Labour Questionnaire
7. Competition Questionnaire (These questions were not asked)
8. Regulation Questionnaire
9. Financial Markets Questionnaire
10. Infrastructure Questionnaire
11. Adjustment Questionnaire
12. Investor Confidence Questionnaire
13. Network Questionnaire
14. Conflict Resolution

Appendix to Labour Markets Questionnaire:
Survey for a Sub-Sample of Workers & Apprentices

Survey Sections (Wave V)

1. General Information Sheet
2. Entrepreneurship Questionnaire
3. General Firm Questionnaire
4. Investment Questionnaire
5. Labour Questionnaire
6. Government Regulation Questionnaire
7. Financial Markets Questionnaire
8. Infrastructure Questionnaire
9. Adjustment Questionnaire
10. Investor Confidence
11. Network Questionnaire
12. Conflict Resolution
13. Worker Questionnaire
14. Apprentice Questionnaire
15 Follow-up on labour, networks, insurance, property rights, miscellaneous

Questions within each of these sections have been further classified into a series of sequential records for ease of reference and data entry purposes. These individual record numbers provide the link between sections of the questionnaire and the data files in which the raw data is stored (see below).

Also, each wave of the questionnaire has been assigned a unique code letter to assist in referencing/ data entry as follows:

Wave I = R;   WaveII = Z;   Wave III = L; Wave IV = S; Wave V = F.

Variables within the data eg output, employment, exports can be identified and extracted by referring to the unique code for the data point which contains the relevant data entry for each of these variables. Some of these references are included in the tables of variables included below.

Description of Raw Data Files

This dataset has been stored and compiled using the Statistical Analysis System (SAS) programming language. The bulk of the raw data extracted from the three waves of the survey are contained in SAS data files (with file extension *.sd2).

These files have been converted to transport (*.dat) format to enable them to be downloaded from the CSAE website and will need to be converted back to their original format in order to be usable within SAS, or alternatively converted into the relevant formats for use with other statistical software packages. For SAS users, an example of the programming necessary to carry out this conversion is included in the convert.sas program file.

For the first three waves of the surveys the raw data files are organised by record number into three folders based upon the respective wave of the survey as follows :

Wave I	Rec 01ext, Rec03 – Rec66	(Questionnaire Code = R)
Wave II	Rec 02 ext, Rec203 – Rec251	(Questionnaire Code = Z)
Wave III	Rec 03ext, Rec303 – Rec358	(Questionnaire Code = L)

For Waves IV and V, an excel file is available for both the firm and the worker questionnaire.

Wave IV	The variables all begin S followed by section and number.
Wave V	The variables all begin F followed by section and number.

In each wave, the initial record contains data which identifies each firm's sector and location. However, the information that would identify the specific firm interviewed has been excluded. The subsequent records contain the raw data obtained from the relevant group of questions ie records in each questionnaire. Where these record numbers are suffixed with a "c" eg Rec03c this indicates that corrections have been made to the data in this file to account for errors identified in the data entry process.

There is one additional raw data file, which is not contained in the three folders described above. This data file titled **inv.sd2** contains some additional observations on the firm's

investment history collected during the Wave 1 survey, but which were not coded and entered with the rest of the data for Wave 1.

It is possible to use these raw data files for analytical purposes. This can be achieved in conjunction with the questionnaire for the relevant wave of the survey, using the coding structure for individual datapoints within each survey in order to create your own variables in SAS or other statistical programming languages. Note that the raw data files can be viewed in the SAS software programme using the "Libraries" function.

However, a great deal of work has already been undertaken to manipulate the raw data into a more usable format and derive a number of the more important variables in which economic researchers may be interested. This work is described in more detail in the following sections and is contained in the set of SAS program files included with this dataset. It is also the case that some variables, for example sector and ownership information, is only available in the SAS files for some firms, usually those that were added in the course of a survey. The SAS files are thus an essential input to using the data.

Data Organisation & Analysis

As already mentioned, over the waves of the survey, the structure and contents of the questionnaire have been modified. Hence, while the data collected over the seven years is broadly comparable, there are some differences, which have subsequently entailed substantial work to improve the data's organisation and derive consistent variables across the waves.

It has also been necessary to take into account various differences in reporting conventions between firms in the sample – for example firm's reporting their production and sales data for different time periods ie weeks, months, years.

This work of organising and "cleaning" the raw data in order to ensure that it can be used successfully in variable identification and analysis has been undertaken using the SAS programming language.

As a result of this work, standardised variables across the three waves have been created in several SAS program files (with file extension *.sas) and have been broadly separated according to the types of variables that these files generate. In order to be able to run these programmes on the data, it will of course be necessary to modify the library names given at the top of each programme which reference the paths of the directory in which the respective raw data files are stored.

Each of the programme files contains a series of data steps which organise the various waves of the data and create a whole range of variables (see listings below). At the end of each programme a permanent data file is created which contains only the main variables generated by the programme across the five waves of the data, where this is relevant. Hence each of the program files is associated with a permanent data file of the same name, which are also included with this dataset.

Program File	Description of Contents
common.sas	Firm-level variables that are common across waves – including dummy variables for firm sector, location and size;
genfirm.sas	General firm variables - including output, employment levels, wage rates, input costs, capital stock and investment levels;
finance.sas	Firm-level financial variables – including both formal & informal sector borrowing, banking arrangements and firm lending;
invest.sas	Firm-level investment variables - including values of investment in land, buildings and plant & equipment, sources of financing and investment/ capital ratios (see separate note on investment data);
capitalstock.sas	Creates a capital stock series based on the investment data;
humancap	Creates a firm-level dataset for human capital based on the individual level data combined with firm level information on the composition of the workforce (see data notes.doc for details of how this has been done);
production.sas	A SAS program for running a production function with both physical and human capital data;

As an example, the program file genfirm.sas contains a series of data steps which are designed to create a number of consistent variables over the three waves of the survey data. These are then combined into a permanent SAS data file titled genfirm.sd2 which contains only the data elements relevant to the calculation of general firm variables over all three waves.

A list of the main variables created within the common, genfirm and finance programs is included in the next section and tables along with a description of the method by which some of these variables (particularly the derived variables) have been created. Please see the two separate notes on investment and workers & apprentices for similar listings of the variables contained in these programs.

Main Variables - Definitions

Tables 1.1 – 1.3 contain a listing of the main variables contained in the first three of the program files entitled 'genfirm' 'common' and 'finance'(see above). Details include the variable name, the section of the survey to which they relate, a brief description & their record reference within the questionnaire. In Table 2 all of these variables are also listed alphabetically for ease of reference.

Please note that the program files also contain a large number of other variables which have not been included in these listings, since, either, they only relate to one particular wave of the survey, or they were derived for analysis of very specific issues within the questionnaire which may not be of particular interest to a wider audience.

These additional notes provide further information on the definition and derivation of some of the more important variables:

Capital Stock (CAP)	This is the replacement value of the firm's total capital stock, which is the measure used in all derived variables using capital. Another variable CAPSALE measures the capital stock's estimated resale value.
Capacity Utilisation output (CAPACT)	Measured as actual output/ potential output * 100. Potential was determined by asking firms how much additional output they could produce with no additional investment in plant and equipment. Note: the original data was not collected on a consistent basis.
Debt levels (DEBT)	Firm's aggregate debt level. This is measured as amounts of borrowing from both formal sources and informal sources over the previous 12 months less the amount of informal lending made by the firm to various types of recipients.
Entrepreneur's Education (EDUCENT)	A continuous variable, representing total years of education, has been derived from responses regarding the highest level of education completed by the entrepreneur. This assumes that primary = 6 years; middle school = 10 years; secondary = 14 years; university = 19 years; secondary plus vocational = 15 years and secondary plus polytechnic = 16 years.
Informal Lending (INFL)	Aggregate of any loans made by enterprise in the last year to suppliers, clients, employees, other enterprises, relatives & friends and others.
Intermediate Costs (INT)	Firm's raw material costs plus indirect costs, including rent, utilities and other overheads.

Output (OUTPUT)	Value of firm's total production during previous year. Note that where there is a missing observation, output is set as the value of firm's total sales in the previous year (= SALES).
Firm's Profits (PROFIT)	Calculated by taking sales revenue less wages less intermediate inputs and indirect costs. There is no allowance for depreciation. This is a measure of gross profits before tax and other charges.
Profit Rate (PRATE)	Measured as the firm's profits as a proportion of the capital stock (replacement value) ie the return on capital employed.
Value Added (VAD)	Calculated by taking firm output less intermediate inputs and indirect costs.
Capital Share (CAPSH)	The % contribution of capital to the firm's value added.
Labour Share (LABSH)	The % contribution of labour to the firm's value added.

Location dummies:

ACCRA	Dummy = 1 for firms based in Accra
KUM	Dummy = 1 for firms based in Kumasi
TAK	Dummy = 1 for firms based in Takoradi
CAPE	Dummy = 1 for firms based in Cape Coast

Sector dummies:

FOODS	Dummy = 1 for food sector (ISIC codes 3110 – 3139, excluding 3117)
BAKERY	Dummy = 1 for bakeries (ISIC code 3117)
WOOD	Dummy = 1 for wood products sector (ISIC codes 3310 - 3319)
FURN	Dummy = 1 for furniture sector (ISIC code 3320)
METAL 3819)	Dummy = 1 for metal products sector (ISIC codes 3810 –
MACHINES	Dummy = 1 for machinery sector (ISIC codes 3820 – 3849)
SSRII	Dummy = 1 for small-scale resource intensive industries. This subsector refers to three specific firms, two charcoal producers (firm # 80, 81) and one processor of gari, a starchy food product (firm # 95).

Size at establishment dummies:

MICRO00	Dummy = 1 for microenterprises (classified as firms with between 1 – 5 employees inclusive)
SMALL00	Dummy = 1 for small firms (6 – 29 employees inclusive)
MEDIUM00	Dummy = 1 for medium-sized firms (30 – 99 employees inclusive)
LARGE00	Dummy = 1 for large firms (100 or more employees)

Ownership dummies:

STATE	Dummy = 1 for 100% state-owned enterprises
SSTATE	Dummy = 1 for any firm with some degree of state ownership
SFOR	Dummy = 1 for private firms with some degree of foreign ownership
GHOWN	Dummy = 1 for private firms with 100% domestic ownership
ANYFOR	Dummy = 1 for any firm with some degree of foreign ownership

Table 1.1   Main Variables Contained in SAS Program File: genfirm.sas

Key Firm Level variables

Variable Name	Survey Section	Description	Wave 1	Wave 2	Wave 3
			Record/ Question Reference		
FIRM	0	Firm number in survey	REC01	REC201	REC301
OUTPUT	2	Total value of firm's output/annum (see note)	R7Q07	Z10Q11	L13Q16
MATA	2	Total cost of raw material inputs/ annum	R7Q09	Z10Q12	L14Q26
MISC	2	Total indirect costs of firm/annum (includes rent, utilities & other overheads)	R8Q15	Z11Q20	L15Q35
INT	2	Total intermediate costs (=MATA+MISC)			
EXPORTS	2	Dummy variable: exporting firm (takes value = 1 if firm exports)	R10Q27	Z11Q26	L16Q46
PEXP	2	% of firm's production that is exported			
EMP	5	Total employment level of firm (includes both full-time & part-time salaried employees)	R11Q01	Z14Q01	L21Q01
PIMPINP	2	% of total firm raw materials that are imported	R7Q11	Z10Q13	L14Q28
ADVERT	2	Total expenditure on advertising/annum	R8Q17	Z11Q22	L15Q36
WAGES	5	Total firm wage bill (including allowances)/annum	R7Q12	Z10Q15	L14Q30
CAP	2	Replacement value of firm's capital stock (see note)	R8Q13A	Z10Q17A	L14Q31
CAPSALE	2	Resale value of firm's capital stock	R8Q13B62	Z10Q17	L14Q34
EDUCENT	1	Education level of entrepreneur in years (see note)	R4Q08	Z4Q08	L5Q08
EDUCGM	4	Education level of general manager (total years)	R52Q07	Z12Q08	L20Q08
EDUCMAN	1	Education level of management (takes value of EDUCENT or, if null, the value of EDUCMAN)			
PROFIT	2	Firm's gross profit (= OUTPUT-MATA-MISC-WAGES)			
VAD	2	Value added (= OUTPUT - MATA - MISC)			
PRATE	2	Profit rate or Return on Capital Employed (= PROFITS/CAP)			
LABSH	2	Labour's share in value added (see note)			
CAPSH	2	Capital's share in value added (see note)			
LVADEMP	2	Log of value added per employee			
PREMP	2	Gross profits per employee (= PROFIT/EMP)			
OUTEMP	2	Value of output per employee (= OUTPUT/EMP)			

Table 1.1 (cont)

Variable Name	Section	Description	Wave 1	Wave 2	Wave 3
INTSH	2	Intermediate costs as share of total output			
MATASH	2	Raw material costs as share of total output			
MISCSH	2	Indirect costs as share of total output			
CAPACT	2	Level of Capacity Utilisation (see note)			

All values are in cedis (current values)

Table 1.2 Main Variables Contained in SAS Program File: common.sas

Firm-Level Variables Common Across Survey Waves

Variable Name	Survey Section	Description	Record/ Question Reference Wave 1	Wave 2	Wave 3
FIRM	0	Firm number in survey	REC01	REC201	REC301
SOLO	2	Dummy: sole trader	R7Q01		
PARTNER	2	Dummy: partnership	R7Q01		
LLE	2	Dummy: limited liability enterprise	R7Q01		
PRIVCORP	2	Dummy: private corporation	R7Q01		
STATCORP	2	Dummy: state-owned corporation	R7Q01		
SUBFOR	2	Dummy: subsidiary of multinational corporation	R7Q01		
EMPL00	1	Employment level at firm start date (employees + apprentices + 1 for entrepreneur)	R3Q02A/B		
EMPL91	5	Total employment level in 1991 (as above)	R11Q01		
ACCRA	0	Firm location dummy: Accra	R1LOC		
KUM	0	Firm location dummy: Kumasi	R1LOC		
TAK	0	Firm location dummy: Takoradi	R1LOC		
CAPE	0	Firm location dummy: Cape Coast	R1LOC		
BAKERY	0	Dummy variable: bakery subsector (see note on ISIC codes)	R1SEC	REC201	REC301
FOODS	0	Dummy variable: food & beverage subsector	R1SEC	REC201	REC301
FURN	0	Dummy variable: furniture subsector	R1SEC	REC201	REC301
GARMENT	0	Dummy variable: garment subsector	R1SEC	REC201	REC301
MACHINES	0	Dummy variable: machinery subsector	R1SEC	REC201	REC301
METAL	0	Dummy variable: metal products subsector	R1SEC	REC201	REC301
TEXTILE	0	Dummy variable: textile subsector	R1SEC	REC201	REC301
WOOD	0	Dummy variable: wood products subsector	R1SEC	REC201	REC301
SSRII	0	Dummy variable: small-scale resource intensive industries	R1SEC	REC201	REC301
STARTYR	1	Year of firm establishment	R3Q01		
FMAGE91	1	Firm's Age (= 1992 - STARTYR)	R3Q01		
UNION91	5	Dummy: Some or all employees unionised	R12Q13		

Table 1.2 (cont)

Variable Name	Section	Description	Wave 1	Wave 2	Wave 3
STATE	2	Dummy: 100% state owned enterprise	R7Q02		
SSTATE	2	Dummy: Any firm with some % of state ownership	R7Q02		
SFOR	2	Dummy: Private firms with some % of foreign ownership	R7Q02		
GHOWN	2	Dummy: Private firms with 100% Ghanaian ownership	R7Q02		
ANYFOR	2	Dummy: Any firm with some % of foreign ownership	R7Q02		
STATGH	2	Dummy: Ghanaian owned firms with some % of state ownership	R7Q02		
PRIVDOM	2	Dummy: Private Domestic firms ie Ghanaian owners only	R7Q02		
PRIVFOR	2	Dummy: Private Foreign firms ie foreign owners only	R7Q02		
PRIVDF	2	Dummy: Private Mixed firms ie Ghanaian & foreign owners	R7Q02		
SPRIVDOM	2	Dummy: Mixed State & Private: Ghanaian only	R7Q02		
SPRIVFOR	2	Dummy: Mixed State & Private: Foreign private only	R7Q02		
SPRIVDF	2	Dummy: Mixed State & Private with both Ghanaian & Foreign private owners	R7Q02		
EMPL92A	5	Employment level in 1992 (full & part-time workers)		Z14Q01	
EMPL92B	5	Employment level in 1992 (full-time workers only)		Z14Q01	
EMPL93	5	Total employment level in 1993			L21Q01
MICRO00	5	Dummy: Microenterprise = 1 - 5 employees inclusive (firm size at establishment)	R11Q01		
SMALL00	5	Dummy: Small Firm = 6 - 29 employees inclusive	R11Q01		
MEDIUM00	5	Dummy: Medium Firm = 30 - 99 employees inclusive	R11Q01		
LARGE00	5	Dummy: Large Firm = 100 or more employees	R11Q01		
ACCTS	5	Dummy: firms keeping accounts on an annual basis	R7Q04		

Table 1.3 Main Variables Contained in SAS Program File: finance.sas
Key Financial Variables

Variable Name	Survey Section	Description	Record/ Question Reference		
			Wave 1	Wave 2	Wave 3
FIRM	0	Firm number in survey (ranges from 1 - 215)			
BORRFOR	6	Total borrowing from formal & semi-formal financial institutions	R39Q06		
BORRINF	6	Total borrowing from informal sources	R43Q03		
ODRAFT	6	Level of overdraft facility (aggregate across financial insts.)	R37Q02		
OVERUS	6	Amount of o/draft facility actually used (aggregate)	R37Q03		
OVERI	6	Average interest rate paid on o/draft facility used	R37Q04		
INFL	6	Informal lending by firm to different categories of recipients (see note on categories)	R34Q03		
DEBT	6	Firm's aggregate debt = BORRFOR + BORRINF - INFL			
TRADB	6	Accounts payable - balance owed to all suppliers		Z28Q01	
TRADL	6	Accounts receivable - amounts due from suppliers eg from prepayment of goods & services		Z28Q02	
INBK	6	Informal borrowing in kind ie non-cash (from different sources)			L43Q04
INLK	6	Informal lending in kind ie non-cash (to different recipients)			
LOANA	6	Dummy: Did firm apply for loan in last year	R41Q24		
LOANNO	6	Dummy: Why did firm not apply for loan	R41Q26		
LOCOL	6	Dummy: Was loan collateral required	R40Q16		
LOCOTYPE	6	Dummy: Type of collateral required	R40Q17		
LOCOVA	6	Value of collateral required (for latest loan application)	R40Q18		

Table 2 Alphabetical Listing of All Variables Identified in Ghana Dataset

Variable Name	Survey Section	Description	Record/ Question Reference		
			Wave 1	Wave 2	Wave 3
ACCRA	0	Firm location dummy: Accra	R1LOC		
ACCTS	5	Dummy: firms keeping accounts on an annual basis	R7Q04		
ADVERT	2	Total expenditure on advertising/annum	R8Q17	Z11Q22	L15Q36
ANYFOR	2	Dummy: Any firm with some % of foreign ownership	R7Q02		
BAKERY	0	Dummy variable: bakery subsector (see note on ISIC codes)	R1SEC	REC201	REC301
BORRFE	6	Formal sector borrowing per employee			
BORRFOR	6	Total borrowing from formal & semi-formal financial institutions	R39Q06		
BORRIE	6	Informal sector borrowing per employee			
BORRINF	6	Total borrowing from informal sources	R43Q03		
CAP	2	Replacement value of firm's capital stock (see note)	R8Q13A	Z10Q17A	L14Q31
CAPACT	2	Level of Capacity Utilisation (see note)			
CAPE	0	Firm location dummy: Cape Coast	R1LOC		
CAPSALE	2	Resale value of firm's capital stock	R8Q13B62	Z10Q17	L14Q34
CAPSH	2	Capital's share in value added (see note)			
DEBT	6	Firm's aggregate debt = BORRFOR + BORRINF - INFL			
EDUCENT	1	Education level of entrepreneur in years (see note)	R4Q08	Z4Q08	L5Q08
EDUCGM	4	Education level of general manager (total years)	R52Q07	Z12Q08	L20Q08
EDUCMAN	1	Education level of management (takes value of EDUCENT or, if null, the value of EDUCMAN)			
EMP	5	Total employment level of firm (includes both full-time & part-time salaried employees)	R11Q01	Z14Q01	L21Q01
EMPL00	1	Employment level at firm start date (employees + apprentices + 1 for entrepreneur)	R3Q02A/B		
EMPL91	5	Total employment level in 1991 (as above)	R11Q01		
EMPL92A	5	Employment level in 1992 (full & part-time workers)		Z14Q01	
EMPL92B	5	Employment level in 1992 (full-time workers only)		Z14Q01	

Variable Name	Section	Description	Wave 1	Wave 2	Wave 3
EMPL93	5	Total employment level in 1993			L21Q01
EXPORTS	2	Dummy variable: exporting firm (takes value = 1 if firm exports)	R10Q27	Z11Q26	L16Q46

Table 2 (cont)

Variable Name	Section	Description	Wave 1	Wave 2	Wave 3
FIRM	0	Firm number in survey (ranges from 1 - 215)			
FMAGE91	1	Firm's Age (= 1992 - STARTYR)	R3Q01		
FOODS	0	Dummy variable: food & beverage subsector	R1SEC	REC201	REC301
FURN	0	Dummy variable: furniture subsector	R1SEC	REC201	REC301
GARMENT	0	Dummy variable: garment subsector	R1SEC	REC201	REC301
GHOWN	2	Dummy: Private firms with 100% Ghanaian ownership	R7Q02		
INBK	6	Informal borrowing in kind ie non-cash (from different sources)			L43Q04
INFL	6	Informal lending by firm to different categories of recipients (see note on categories)	R34Q03		
INLK	6	Informal lending in kind ie non-cash (to different recipients)			
INT	2	Total intermediate costs (=MATA+MISC)			
INTSH	2	Intermediate costs as share of total output			
KUM	0	Firm location dummy: Kumasi	R1LOC		
LABSH	2	Labour's share in value added (see note)			
LARGE00	5	Dummy: Large Firm = 100 or more employees	R11Q01		
LLE	2	Dummy: limited liability enterprise	R7Q01		
LOANA	6	Dummy: Did firm apply for loan in last year	R41Q24		
LOANNO	6	Dummy: Why did firm not apply for loan	R41Q26		
LOCOL	6	Dummy: Was loan collateral required	R40Q16		
LOCOTYPE	6	Dummy: Type of collateral required	R40Q17		
LOCOVA	6	Value of collateral required (for latest loan application)	R40Q18		
LVADEMP	2	Log of value added per employee			
MACHINES	0	Dummy variable: machinery subsector	R1SEC	REC201	REC301
MATA	2	Total cost of raw material inputs/ annum	R7Q09	Z10Q12	L14Q26
MATASH	2	Raw material costs as share of total output			
MEDIUM00	5	Dummy: Medium Firm = 30 - 99 employees inclusive	R11Q01		
METAL	0	Dummy variable: metal products subsector	R1SEC	REC201	REC301
MICRO00	5	Dummy: Microenterprise = 1 - 5 employees inclusive (firm size at establishment)	R11Q01		

Variable Name	Section	Description	Wave 1	Wave 2	Wave 3
MISC	2	Total indirect costs of firm/annum (includes rent, utilities & other overheads)	R8Q15	Z11Q20	L15Q35

Table 2 (cont)

Variable Name	Section	Description	Wave 1	Wave 2	Wave 3
MISCSH	2	Indirect costs as share of total output			
ODRAFT	6	Level of overdraft facility (aggregate across financial insts.)	R37Q02		
ODRAFTE	6	Outstanding overdraft per employee			
OUTEMP	2	Value of output per employee (= OUTPUT/EMP)			
OUTPUT	2	Total value of firm's output/annum (see note)	R7Q07	Z10Q11	L13Q16
OVERI	6	Average interest rate paid on o/draft facility used	R37Q04		
OVERUS	6	Amount of o/draft facility actually used (aggregate)	R37Q03		
PARTNER	2	Dummy: partnership	R7Q01		
PEXP	2	% of firm's production that is exported			
PIMPINP	2	% of total firm raw materials that are imported	R7Q11	Z10Q13	L14Q28
PRATE	2	Profit rate or Return on Capital Employed (= PROFITS/CAP)			
PREMP	2	Gross profits per employee (= PROFIT/EMP)			
PRIVCORP	2	Dummy: private corporation	R7Q01		
PRIVDF	2	Dummy: Private Mixed firms ie Ghanaian & foreign owners	R7Q02		
PRIVDOM	2	Dummy: Private Domestic firms ie Ghanaian owners only	R7Q02		
PRIVFOR	2	Dummy: Private Foreign firms ie foreign owners only	R7Q02		
PROFIT	2	Firm's gross profit (= OUTPUT-MATA-MISC-WAGES)			
SFOR	2	Dummy: Private firms with some % of foreign ownership	R7Q02		
SMALL00	5	Dummy: Small Firm = 6 - 29 employees inclusive	R11Q01		
SOLO	2	Dummy: sole trader	R7Q01		
SPRIVDF	2	Dummy: Mixed State & Private with both Ghanaian & Foreign private owners	R7Q02		
SPRIVDOM	2	Dummy: Mixed State & Private: Ghanaian only	R7Q02		
SPRIVFOR	2	Dummy: Mixed State & Private: Foreign private only	R7Q02		
SSRII	0	Dummy variable: small-scale resource intensive industries	R1SEC	REC201	REC301
SSTATE	2	Dummy: Any firm with some % of state ownership	R7Q02		
STARTYR	1	Year of firm establishment	R3Q01		
STATCORP	2	Dummy: state-owned corporation	R7Q01		
STATE	2	Dummy: 100% state owned enterprise	R7Q02		

STATGH   2   Dummy: Ghanaian owned firms with some % of state ownership   R7Q02

Table 2 (cont)

Variable Name	Section	Description	Wave 1	Wave 2	Wave 3
SUBFOR	2	Dummy: subsidiary of multinational corporation	R7Q01		
TAK	0	Firm location dummy: Takoradi	R1LOC		
TEXTILE	0	Dummy variable: textile subsector	R1SEC	REC201	REC301
TRADB	6	Accounts payable - balance owed to all suppliers		Z28Q01	
TRADL	6	Accounts receivable - amounts due from suppliers eg from prepayment of goods & services		Z28Q02	
UNION91	5	Dummy: Some or all employees unionised	R12Q13		
VAD	2	Value added (= OUTPUT - MATA - MISC)			
WAGES	5	Total firm wage bill (including allowances)/annum	R7Q12	Z10Q15	L14Q30
WOOD	0	Dummy variable: wood products subsector	R1SEC	REC201	REC301

Table 3   Complete Listing of Variables Identified in Ghana Dataset by Survey Section

Variable Name	Survey Section *	Description	Record/ Question Reference		
			Wave 1	Wave 2	Wave 3
		Section 0: Firm Classification Variables			
ACCRA	0	Firm location dummy: Accra	R1LOC		
BAKERY	0	Dummy variable: bakery subsector (see note on ISIC codes)	R1SEC	REC201	REC301
CAPE	0	Firm location dummy: Cape Coast	R1LOC		
FIRM	0	Firm number in survey (ranges from 1 - 215)			
FOODS	0	Dummy variable: food & beverage subsector	R1SEC	REC201	REC301
FURN	0	Dummy variable: furniture subsector	R1SEC	REC201	REC301
GARMENT	0	Dummy variable: garment subsector	R1SEC	REC201	REC301
KUM	0	Firm location dummy: Kumasi	R1LOC		
MACHINES	0	Dummy variable: machinery subsector	R1SEC	REC201	REC301
METAL	0	Dummy variable: metal products subsector	R1SEC	REC201	REC301
SSRII	0	Dummy variable: small-scale resource intensive industries	R1SEC	REC201	REC301
TAK		Firm location dummy: Takoradi	R1LOC		
TEXTILE	0	Dummy variable: textile subsector	R1SEC	REC201	REC301
WOOD	0	Dummy variable: wood products subsector	R1SEC	REC201	REC301
		Section1: Entrepreneurship Variables			
EDUCENT	1	Education level of entrepreneur in years (see note)	R4Q08	Z4Q08	L5Q08
EDUCMAN	1	Education level of management (takes value of EDUCENT or, if null, the value of EDUCMAN)			
EMPL00	1	Employment level at firm start date (employees + apprentices + 1 for entrepreneur)	R3Q02A/B		
FMAGE91	1	Firm's Age (= 1992 - STARTYR)	R3Q01		
STARTYR	1	Year of firm establishment	R3Q01		
		Section 2: General Firm Variables			
ADVERT	2	Total expenditure on advertising/annum	R8Q17	Z11Q22	L15Q36
ANYFOR	2	Dummy: Any firm with some % of foreign ownership	R7Q02		

Table 3 (cont)

Variable Name	Section	Description	Wave 1	Wave 2	Wave 3
CAP	2	Replacement value of firm's capital stock (see note)	R8Q13A	Z10Q17A	L14Q31
CAPACT	2	Level of Capacity Utilisation (see note)			
CAPSALE	2	Resale value of firm's capital stock	R8Q13B62	Z10Q17	L14Q34
CAPSH	2	Capital's share in value added (see note)			
EXPORTS	2	Dummy variable: exporting firm (takes value = 1 if firm exports)	R10Q27	Z11Q26	L16Q46
GHOWN	2	Dummy: Private firms with 100% Ghanaian ownership	R7Q02		
INT	2	Total intermediate costs (=MATA+MISC)			
INTSH	2	Intermediate costs as share of total output			
LABSH	2	Labour's share in value added (see note)			
LLE	2	Dummy: limited liability enterprise	R7Q01		
LVADEMP	2	Log of value added per employee			
MATA	2	Total cost of raw material inputs/ annum	R7Q09	Z10Q12	L14Q26
MATASH	2	Raw material costs as share of total output			
MISC	2	Total indirect costs of firm/annum (includes rent, utilities & other overheads)	R8Q15	Z11Q20	L15Q35
MISCSH	2	Indirect costs as share of total output			
OUTEMP	2	Value of output per employee (= OUTPUT/EMP)			
OUTPUT	2	Total value of firm's output/annum (see note)	R7Q07	Z10Q11	L13Q16
PARTNER	2	Dummy: partnership	R7Q01		
PEXP	2	% of firm's production that is exported			
PIMPINP	2	% of total firm raw materials that are imported	R7Q11	Z10Q13	L14Q28
PRATE	2	Profit rate or Return on Capital Employed (= PROFITS/CAP)			
PREMP	2	Gross profits per employee (= PROFIT/EMP)			
PRIVCORP	2	Dummy: private corporation	R7Q01		
PRIVDF	2	Dummy: Private Mixed firms ie Ghanaian & foreign owners	R7Q02		
PRIVDOM	2	Dummy: Private Domestic firms ie Ghanaian owners only	R7Q02		
PRIVFOR	2	Dummy: Private Foreign firms ie foreign owners only	R7Q02		
PROFIT	2	Firm's gross profit (= OUTPUT-MATA-MISC-WAGES)			
SFOR	2	Dummy: Private firms with some % of foreign ownership	R7Q02		

Table 3 (cont)

Variable Name	Section	Description	Wave 1	Wave 2	Wave 3
SOLO	2	Dummy: sole trader	R7Q01		
SPRIVDF	2	Dummy: Mixed State & Private with both Ghanaian & Foreign private owners	R7Q02		
SPRIVDOM	2	Dummy: Mixed State & Private: Ghanaian only	R7Q02		
SPRIVFOR	2	Dummy: Mixed State & Private: Foreign private only	R7Q02		
SSTATE	2	Dummy: Any firm with some % of state ownership	R7Q02		
STATCORP	2	Dummy: state-owned corporation	R7Q01		
STATE	2	Dummy: 100% state owned enterprise	R7Q02		
STATGH	2	Dummy: Ghanaian owned firms with some % of state ownership	R7Q02		
SUBFOR	2	Dummy: subsidiary of multinational corporation	R7Q01		
VAD	2	Value added (= OUTPUT - MATA - MISC)			
EDUCGM	4	Education level of general manager (total years)	R52Q07	Z12Q08	L20Q08
Section 5: Labour Market Variables (Firm-Level)					
ACCTS	5	Dummy: firms keeping accounts on an annual basis	R7Q04		
EMP	5	Total employment level of firm (includes both full-time & part-time salaried employees)	R11Q01	Z14Q01	L21Q01
EMPL91	5	Total employment level in 1991 (as above)	R11Q01		
EMPL92A	5	Employment level in 1992 (full & part-time workers)		Z14Q01	
EMPL92B	5	Employment level in 1992 (full-time workers only)		Z14Q01	
EMPL93	5	Total employment level in 1993			L21Q01
LARGE00	5	Dummy: Large Firm = 100 or more employees	R11Q01		
MEDIUM00	5	Dummy: Medium Firm = 30 - 99 employees inclusive	R11Q01		
MICRO00	5	Dummy: Microenterprise = 1 - 5 employees inclusive (firm size at establishment)	R11Q01		
SMALL00	5	Dummy: Small Firm = 6 - 29 employees inclusive	R11Q01		
UNION91	5	Dummy: Some or all employees unionised	R12Q13		
WAGES	5	Total firm wage bill (including allowances)/annum	R7Q12	Z10Q15	L14Q30
Section 6: Financial Markets Variables					
BORRFE	6	Formal sector borrowing per employee			
BORRFOR	6	Total borrowing from formal & semi-formal financial insts	R39Q06		

Table 3 (cont)

Variable Name	Section	Description	Wave 1	Wave 2	Wave 3
BORRIE	6	Informal sector borrowing per employee			
BORRINF	6	Total borrowing from informal sources	R43Q03		
DEBT	6	Firm's aggregate debt = BORRFOR + BORRINF – INFL			
INBK	6	Informal borrowing in kind ie non-cash (from different sources)			L43Q04
INFL	6	Informal lending by firm to different categories of recipients (see note on categories)	R34Q03		
INLK	6	Informal lending in kind ie non-cash (to different recipients)			
LOANA	6	Dummy: Did firm apply for loan in last year	R41Q24		
LOANNO	6	Dummy: Why did firm not apply for loan	R41Q26		
LOCOL	6	Dummy: Was loan collateral required	R40Q16		
LOCOTYPE	6	Dummy: Type of collateral required	R40Q17		
LOCOVA	6	Value of collateral required (for latest loan application)	R40Q18		
ODRAFT	6	Level of overdraft facility (aggregate across financial insts.)	R37Q02		
ODRAFTE	6	Outstanding overdraft per employee			
OVERI	6	Average interest rate paid on o/draft facility used	R37Q04		
OVERUS	6	Amount of o/draft facility actually used (aggregate)	R37Q03		
TRADB	6	Accounts payable - balance owed to all suppliers		Z28Q01	
TRADL	6	Accounts receivable - amounts due from suppliers eg from prepayment of goods & services		Z28Q02	

Note: Section refers to relevant section of the Questionnaire in Wave III