WHO CREATES MORE JOBS: SMALL VS LARGE FIRMS, YOUNG VS OLD FIRMS: EVIDENCE FROM THE ETHIOPIAN MANUFACTURING SECTOR

BY

ALI, MESFIN ABRAHAM

THESIS

Submitted to

KDI School of public policy and management

in partial fulfillment of the requirements

for the degree of

MASTER OF DEVELOPMENT POLICY

2013

WHO CREATES MORE JOBS: SMALL VS LARGE FIRMS, YOUNG VS OLD FIRMS: EVIDENCE FROM THE ETHIOPIAN MANUFACTURING SECTOR

BY

ALI, MESFIN ABRAHAM

THESIS

Submitted to

KDI School of public policy and management

in partial fulfillment of the requirements

for the degree of

MASTER OF DEVELOPMENT POLICY

2013

Professor Lee, Seung-Joo

WHO CREATES MORE JOBS: SMALL VS LARGE FIRMS, YOUNG VS OLD FIRMS: EVIDENCE FROM THE ETHIOPIAN MANUFACTURING SECTOR

BY

ALI, MESFIN ABRAHAM

THESIS

Submitted to

KDI School of public policy and management

in partial fulfillment of the requirements

for the degree of

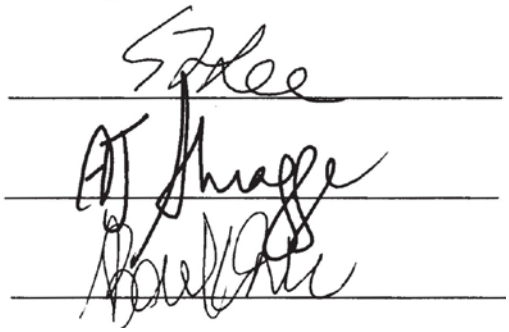
MASTER OF DEVELOPMENT POLICY

Committee in charge:

Professor Lee, Seung-Joo, Supervisor

Professor Shragge, Abraham Joseph

Professor Beak, Jisun



Approval as of December, 2013

ABSTRACT

BY

ALI, MESFIN ABRAHAM

The role of size and age of firms in the process of job creation have well been analyzed empirically. But, this question have not been formally anlyzed in the context of Ethiopia.In this study, by using 15 years longituidinal data on individual establihsments in the manufacturing sector of Ethiopia, the rates of job creation and destruction are compared and analyzed for different firm size or age classes and across industries. The results of the statistical and econometric analysis suggest that smaller sized and younged aged firms are important sources of new job creation and job destruction as well. But, the results of the analysis on net employment creation suggested that, the effect of firm size on net employment creation is sensitive to the measure of size used.

ACKNOWLEDGMENT

I would like to thank my advisors professor Abraham Shragge and professor Seung- Joo lee for their helpful comments and suggestions in the process of writing this study. I would also like to thank The Central Statistics Authority of Ethiopia for providing me with all the data necessary to complete this study without which nothing was possible. Last but not least I would like to thank all of my colleagues who contributed in the writing of this paper in many ways that I could not have the space to list it here.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVATIONS

CSA: Central Statistics Authority of Ethiopia

EEA: Ethiopian Economic Association

EEPCO: Ethiopia Electric Power Corporation

EPRDF: Ethiopian People Revolutionary Democratic Front

ETB: Ethiopian Birr

GDP: Gross Domestic Product

GJC: Gross Job Creation

GJD: Gross Job Destruction

ISIC: International Standard Industrial Classification

MOFED: Ethiopian Ministry of Finance and Economic Development

MOLSA: Ethiopian Ministry of Labor and Social Affairs

NBE: National Bank of Ethiopia

NEC: Net Employment Creation

OLS: Ordinary Least Squares

WB: World Bank

1. INTRODUCTION

Maintaining stable and low levels of unemployment have long been one of the concerns of macroeconomists and policy makers around the world. In the one hand Policy makers have been concerned with raising the job generating power of their economies through different means. Different type of firms, industries or sectors which were thought to absorb a large portion of the labor force or which were thought to create more new jobs than the rest have long been given protections and favorable package of incentives. In the other hand, economists or researches have been concerned with identifying the type and silent features of high growth firms or industries. Particularly, the type and nature of growth and size distribution of firms has thoroughly been analyzed. Many other empirical studies have focused on the role of firm level attributes (size, age or industry) which seem to explain differences in growth and job generation capacity among firms or industries.

The empirical results of such studies have been used, by policy makers, to devise policies that would help promote the job generating powers of firms in particular and the economy in general. Earlier and most prominent empirical studies on job generating powers of different group of firms have claimed that small firms account for a large share of new jobs created (for example see David Birch). This claim has led policy makers to devise policies that promote small firms as a source of boosting new employment absorption capacity of the economy. Many other studies have confirmed the claim that small firms account for a large share of new employment creation. But, some others have refuted this claim (See for example S.J Davis and et.al 1993).

In the Ethiopian economy case the role of size or other firm attributes to employment creation has not been formally analyzed. Though the issue of the dynamics of firm growth

has been investigated no separate or formal analysis, as to my knowledge, has been made to the issue of firm level attributes and their implications to the dynamics of job flows. In this study by using longitudinal firm level data, the relationship between firm or industry attributes and the dynamics of job flows is investigated. Using the advantage of fifteen years longitudinal data, the question of which type of firms create more jobs is analyzed in the context of the Ethiopian Manufacturing sector.

This paper proceeds as follows. In section two and three of this study a review of the literature on the issue to be addressed and a review of the performance of the Ethiopian Economy is given. In section four and five the methodology adopted and the data used in the study are explained. In the remaining sections of the study the descriptive and econometric results of the data analysis are presented.

2. LITERATURE REVIEW

The literature on the size/age of firms and their job generating powers is closely linked to size/age-growth relationship. This is so because of the fact that one of the ways in which growing firms interacts with the economy, according to Zoltan Acs and others, is through employment change (Zoltan J. Acs 2008). In addition for profit maximizing firms, the decision to hire more employees or to lay off some comes from the decision to produce more (grow more) or the decision to produce less (contract) depending on their expectation of changes in the demand for their products. As a result a brief review of the literature on firm size/age-growth dynamics will be given before proceeding to the review of literature on size/age of firms and job flow dynamics.

2.1 SIZE AND GROWTH OF FIRMS

At the microeconomic level the issue of industry growth dynamics in general and firm size-growth relationship in particular has long been the subject of empirical investigation in the field industrial organization. The macroeconomic implications of these investigations shade light to the analysis of aggregate employment and output dynamics. In particular the microeconomic analysis of size/age and growth relationship can be extended to the analysis of the dynamics of job creation and destruction at macroeconomic level.

The empirical study of firm size growth relationships, according to Sutton, can be traced back to the work of Robert Gibrat. In his book, *Inegalites Economiques*, which was published in 1931, Gibrat gave a formal treatment of the firm or industry dynamics.(Sutton 1997). According to Gibrat growth of firms is independent of their size. In other words, the average proportionate growth rate for small, medium and large firms is the same (Hart 1962). This has been called *Gibrat's Law of Proportionate Effect* and was subject to various empirical

tests (Santerelli and et al. 2006). See Santarelli and others for a review of literature on the empirical test of Gibrat's law. One implication of Gibrat's law is that, according to Hart, the proportionate growth rate of firms is log normally distributed. .

The literature on whether Gibrat's law holds or not has focused on, besides the validity of the law itself, on the methodological issues that arise when modeling the size-growth relationship econometrically. The econometric issues mainly addressed, according to Sutton, in the literature focus on the problem of sample censoring (the issue of exiting firms), the functional specification of the model and the issue of heteroscedasticity (Sutton, 45). In the literature depending on how these issues were addressed, the result of the empirical test of Gibrat's law varied. For example Mansfield suggested that Gibrat's law can be tested in three ways; for all firms, for only surviving firms and only for firms exceeding the minimum efficient size in the industry (Mansfield, 1033). When Mansfield tested the law for all firms Gibrat's law failed to hold and when it was tested for only surviving firms he found out that smaller firms had higher and more variable growth rate than larger firms. But, when the law was tested for firms that exceed the industry's minimum efficient scale, Gibrat's law seems to hold.

Simon and Bonini, according to P. E. Hart, argued that the Yule distribution (which assumes a constant rate of birth for new firms in the lower size firm classes) is superior to log normal distribution to approximate size distribution of firms since entry and exit (which represent zero size at a certain point in time) cannot be accounted by logarithmic econometric analysis (Hart, 30).

In general, empirical research on size-growth relationship has mostly focused on finding new evidence on the relationship by employing different techniques of addressing the statistical and econometric issues that arise in the analysis.

2.2 SIZE OF FIRMS AND THEIR JOB FLOWS RATES

The question of which type of firms create more jobs (Small Vs Large, Young Vs Old) has long been debated. Identifying the peculiar characteristics of these High Impact Firms (in the words of Zoltan Acs), the extent of their impact and the methodology employed to address these issues have been the center of the debate. A review of these issues has been given in this section of the literature.

Perhaps the most notable and widely cited work on the role and types of high impact firms have been given by David Birch in 1979. In his seminal work, The *Job Generating Process*, Birch presented an economic framework that explains how the individual firm behavior brought changes in the US employment (Landstrom 1996). Using the Dun and Bradstreet database for the years 1969, 1972, 1974 and 1976, Birch analyzed job flows (expansion, contraction, entry, exit and migration of firms) across establishments and across regions in the US. He found out that over the four years period two third of all net new jobs were created by firms with 20 or less employees and firms with 100 or less employees created 80% of all net new jobs. In addition he found out that the average age of high impact firms is four years and once a high impact firm is four years, its job creating power declines (Landstrom, 2).

The result of Birch's analysis triggered the debate and the search for empirical evidence on the type and role of these high impact firms. Specifically the search for evidence has focused on the role of size and age of firms in new job creation. The argument that small firm are the

major new job creators have been questioned in different respects. One aspect is the result of the analysis itself. For instance, the Brookings Institute tried to assess Birch's analysis using the same database for the years 1978-80 and couldn't replicate Birch's findings (Ibid). The work of Brown, Hamilton and Medoff pointed out that small business does not deserve the much attention given to them (Kirchhof 1991). According to Kirchhoff, they suggested different points which stands in contrast to Birch's finding. First they contend that since small firms' share of employment does not increase, they cannot be generating a large amount of new jobs. They argue that since new firms are small by accident of birth, entry of small firms cannot be attributed to small firm job creation. In addition to this, they contended that only a portion of small firms grow and those who are growing expand until they became large firms, which leaves the employment share of small firm's unchanged. Second they suggested that large firms provide a better working environment (hours of work, wages, fringe benefits…etc) than small firms. The third point they raise relates to job security which is, according to them, much better in large than in small firms (Ibid, 3-5). These points have led them to conclude that small firms are not better job generators than large firms.

In addition to his results, the methodology employed by Birch has been criticized. S.J Davis and et al. (DHS from now on)suggested that the claims about the job creating powers of small firms comes from misinterpretation of the data on the size distribution of employment, the problem of regression to the mean and the use of unsuitable data (Davis et al. 1993). Birch's analysis has been criticized on the last two grounds. According to DHS, if we are using the size distribution of firms at certain point to determine the share of a certain group of firms on new job creation, the resulting answer will be distorted. This is because of the

fact that firms migrate from one class to another (when using a certain cut off point to classify firms) through time. Using size distribution will result in what DHS call the size distribution fallacy. The remedy to this problem requires the use of longitudinal data on individual firms (Davis et al. 1993, 14). Closely related to this problem is, according to DHS, the confusion between net and gross job creation that arises in longitudinal studies that focus on net employment growth accounted by a certain group of firms. The use of gross job flow rates instead of net job flow rates, according to DHS, would avoid the confusion.

The other most notable problem that DHS point out is the regression to the mean bias. According to Davidsson and others, the regression fallacy arises when transitory changes across the size boundary of firms results in biases that favor small firms. When using initial size of firms to classify firms into different groups, the result of the analysis would result in biases that positively favor small firms. Whenever firms change size groups, the initial (Base Year) method of assigning firms into different size presents smaller firms favorably compared to other methods which assigns firms into groups that keep their size group constant over time or compared to a method which accounts the change in employment to the size class of the firm that is observed at the time the change occurred (Davidsson, et al. 1998).

The third problem raised by DHS is the use of unsuitable database. According to DHS, the Dun and Bradstreet database (which was used by Birch and others) sufferes from two problems. One is the large discrepancy in US employment as reported in the Dun and Bradstreet database and as produced and reported by the US Bereau of Labor Statistics. The other problem in the Dun and Bradstreet database lies in its in accurate treatment of firm births and deaths (Davis et al. 1993, 19).

DHS proceeded to analyze how job creation and destruction varies across establishments of different size in the US manufacturing sector for the years 1972 to 1988. They used the Longitudinal Research Database obtained from the Center of Economic Studies of the US Bureau of Census. Their findings were rather contradicting to that of Birch's. They attributed this contradiction to the methodological issues they raised. They found out that large plants and firms are important new job creators and destroyers as well. Specifically, between the period 1972 to 1988 firms with 100 or more employees accounted for two thirds of job creation and those firms with 500 or more employees account for more than half of job creation over the period. Over the same period, smaller manufacturing firms have had higher rates of gross job creation and high rates of job destruction but not higher rates of net job creation (which is the sum of gross job creation and gross job destruction). This suggested that, over the sample period net job creation in the US manufacturing sector showed no systematic relationship with employer size (Davis et al. 1993, 6).

But, the methodological problems outlined by DHS have not all been considered significant. According to Davidsson and other, the first two problems are not significant since only a few studies suffer from the problems and that the bias could be in any direction and does not produce results that favor small firms (Davidsson, et al. 1998, 3). They analyzed the extent of over estimation of small firm job creation due to the regression fallacy on Swedish firms for the period 1990 to 1993 and found out that effect of the regression bias is very small and that its correction does not lead to qualitative changes of the results.

In another study by Birch and Medoff, it was suggested that it not necessarily young or small firms that create more jobs but rather high growth firms or "Gazelles" that move between small and large firms. These Gazelles were found to create a significant share of net new

jobs and were on average younger and smaller (young age bieng more important factor in growth than small size) than other firms (Zoltan J. Acs and et al. 2008). Using simillar approach Z. Acs and et al. found out that High Impact Firms (synonmus with that of Birch's Gazelles) are relatively old, rare and contributed significantly to the over all US economy growth between the priod 1994 to 2006.

The positive role of small size on job creation and destruction has been evidenced by various studies. See for instance David Neumark, Brandon Wall and Junfu Zhang, 2008; Alexander Hijzen, Richard Upward and Peter W. Wright, 2010: Scott Schuh and Robert K. Triest, 2000; David B. Audretsch, 2002; Matthew Barnes, Jonathan Haskel, 2002; Garnett Picot and Richard Dupuy, 1996). Others stress the importance of age (see for instance; John Haltiwanger, Ron S. Jarmin and Javier Miranda, 2011; Stefan Bojnec and Josef Konings, 1998).

3. A BRIEF REVIEW OF THE ETHIOPIAN ECONOMY

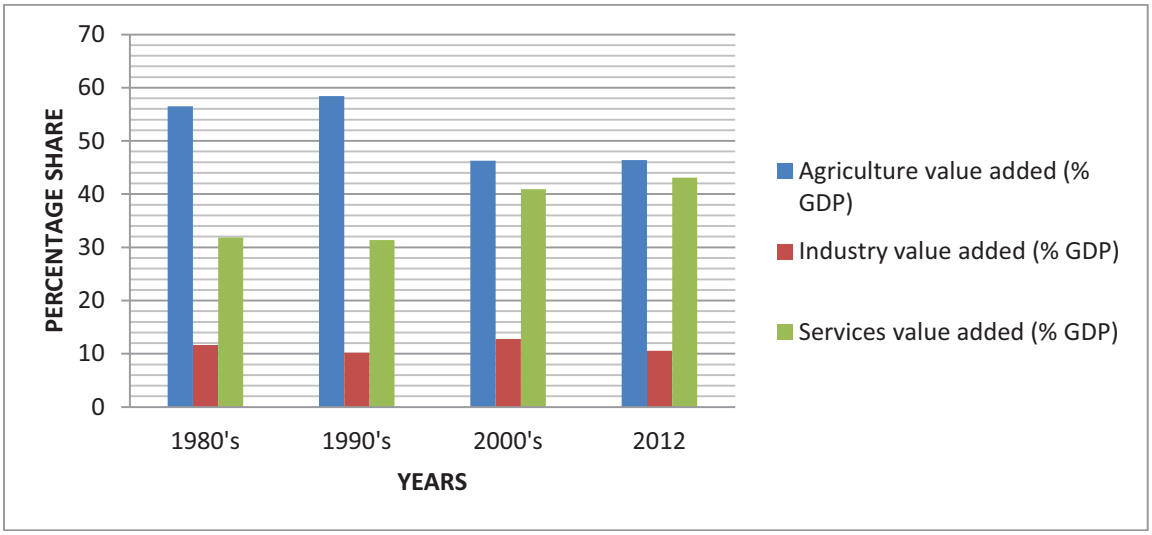
3.1 OVERALL MACRO ECONOMIC PERFORMANCE

With a population of around 84 million people, Ethiopia is the second most populous country in Africa. It has a land area of 1.1 million KM^2 and is the largest land locked country in Africa. The country is among one of the developing Sub-Sahara African economies. Agriculture has long been the backbone of the economy. The Agricultural sector employed 84% of the labor force and constituted 41 % of GDP and 50% of exports as of 2011. Historically the country's economic performance has been dependent on the performance of the agriculture sector and on the economic policies of different political regimes towards the sector. The agriculture sector's performance has been very low for decades due to its heavy reliance on tradition methods of farming, drought and lack of clear and sustainable policy packages from the side of different regimes.

Owing to its largest share in employment, the agricultural sector's contribution to overall GDP is relatively higher. But, its share in value added GDP, as shown in figure 1, has shown a decline over the past three decades. The share of the service sector of the economy has been increasing while the industrial sector has remained relatively stagnant.

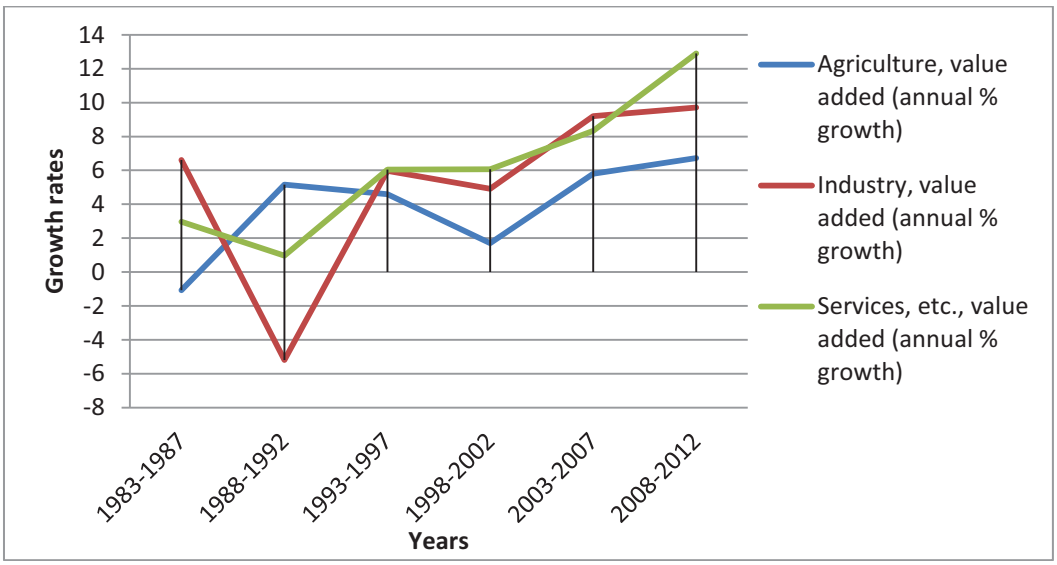
The export items of the country are mainly agricultural and semi finished primary products. But, Ethiopia imports mostly finished products, consumer and capital goods which significantly worsened the country overall trade deficit. According to NBE statistics, the overall annual trade deficit was on average 16.7% of GDP between the periods 1999 to 2010 (NBE 2011).

Figure 1 DECOMPOSITION OF GDP BY MAIN SECTORS



Source: World Bank, 2013

Figure 2 AVERAGE GROWTH RATES OF MAJOR SUB SECTORS



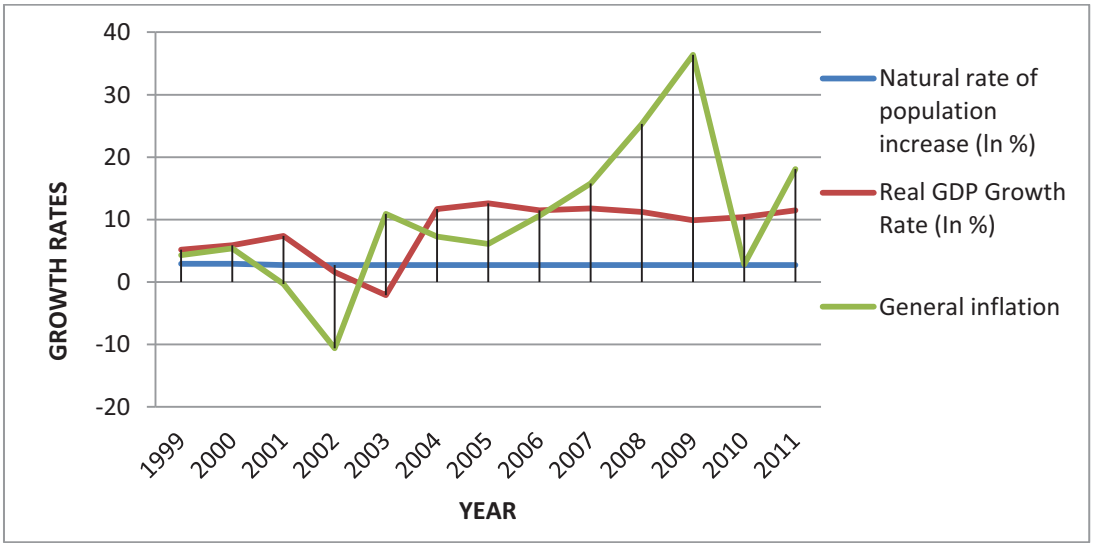
Source: World Bank, 2013

Between the periods 1974 and 1991 Ethiopia was under the rule of a socialist military party, "The Derg". During this period ownership of private property was strictly limited and the private sector was curtailed from active involvement in the economy. Only new ventures with a maximum capital of 500,000 ETB ($29,412) were allowed to operate. It is after the overthrow of the Derg regime that the country began to experience a number of economic and political reforms. When the new government, EPRDF, came to power in 1991 the

country was suffering from many structural and economic problems which all have contributed to the poor macro economic performance.

The new government made important economic and political reforms in the hope to foster the country's economic progress and set the grounds for a free-market economy. The various regulations that restricted the active participation of the private sector and the free working of the market economy were lifted and new regulations that promote private investment, free market and economic growth were put in place. The performance of the Ethiopian economy has improved significantly over the coming years after the introduction of these measures. Recently owing to introduction of different policy measures and many government financed long term projects, the Ethiopian economy has been on the path sustained economic growth. Over the past decade the economy registered an annual average real GDP growth rate of 9.26% which resulted in parallel high inflation rates.

Figure 3 TRENDS IN GROWTH RATES OF REAL GDP, INFLATION AND POPULATION

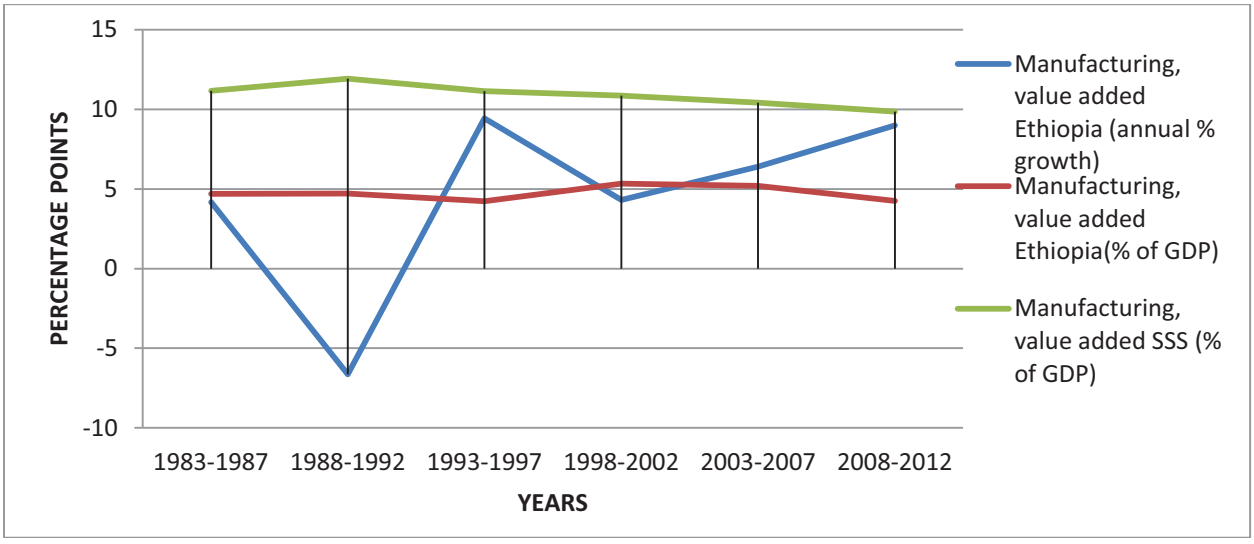


SOURCE: NBE, 2011

3.2 THE PERFORMANCE OF THE MANUFACTURING SECTOR

The free market history of Ethiopia is a very short one. As a result, the role of the private sector in the economy in general and to the country's industrial development in particular has been limited. Particularly the manufacturing sector's contribution to the economy is very low and relatively stagnant. The manufacturing sector's contribution to the Ethiopian economy is relatively low both in terms of value added and employment. The sector is dominated by food and beverage industries where textile and leather industries also play a significant role in the export market(LOC 2005).

Figure 4 TRENDS IN THE SHARE AND GROWTH RATE OF THE ETHIOPIAN MANUFACTURING SECTOR'



Source: (World Bank, 2013)

Despite the positive growth rate the manufactruing sector has registered over the past five or more years, its contribution to the country's total output has remianed relatively stagnant. As shown in figure 3, manufactruing sector's share in total value added has not exceeded 6% of GDP over the past three decades. This is by far the lowest even by the Sub Saharan Africa standard where the contribution of the manufacturing sector for SSA was not on average lower than 9% of GDP over the past three decades.

The food and beverages industrial group largely dominates the large and medium scale manufacturing sector both in terms of employment and value added. In addition most of these industries are concentrated in Addis Ababa (the capital of Ethiopia) and surrounding nearby regions.

Table 1 PATTERNS IN NUMBER OF PERSONS ENGAGED AND VALUE ADDED BY INDUSTRIAL GROUPS

Industrial Group	Number of Persons Engaged (as % of total persons engaged in the manufacturing sector)		Value Added (as % of total manufacturing value added)		Share of firms located in Addis Ababa (as % of total manufacturing firms)
	2006	2010	2006	2010	2010
Manufacture of Food Products and Beverages	30.1	32.3	40.4	35.0	38.3
Manufacture of Tobacco products	0.6	0.5	3.7	-0.1	100.0
Manufacture of Textiles	18.5	11.5	3.4	6.3	42.5
Manufacture of Wearing Apparel	3.5	5.0	0.6	1.7	80.4
Manufacture of footwear luggage and handbags	6.7	5.8	4.4	2.3	60.5
Manufacture of Wood and Wood products	1.5	1.8	0.8	0.1	24.1
Manufacture of Paper, Paper products and Printing	6.8	5.4	5.4	4.9	76.4
Manufacture of Chemicals and Chemical Products	4.8	6.0	4.9	8.1	57.3
Manufacture of Rubber and Plastic Products	5.8	7.4	8.9	7.4	64.0
Manufacture of Other Non Metallic mineral Products	8.6	10.8	15.7	19.2	19.7
Manufacture of Basic Iron and Steel	1.8	2.2	3.9	1.5	17.9
Manufacture of Fabricated Metal products	4.9	5.4	3.0	6.9	53.9
Manufacture of Machinery and Equipment N.E.C	0.3	0.5	0.1	0.5	66.7
Manufacture of Motor vehicles, Trailers and Semi Trailers	1.2	0.9	2.4	2.3	36.4
Manufacture of Furniture	5.0	4.6	2.4	4.0	27.8
Total	100.0	100.0	100.0	100.0	40.3

Source: (CSA 2011) and (MOFED 2011)

The poor performance of the manufacturing sector can be attributed to many structural and economic problems. Lack of competition, corruption and poor sectoral linkages have all contributed to the lack of dynamism in the manufacturing sector. According to EEA annual report on the Ethiopian economy, the poor performance of the manufacturing sector is closely associated with the poor performance of the agricultural sector and political instability and with the recent hasty opening up of the economy, due to the Structural Adjustment Program, which forced many firms into exit (EEA 2004).

3.3 UNEMPLOYMENT IN ETHIOPIA

In recent years macroeconomic issues such as inflation and unemployment have been challenging the policy makers of the Ethiopian government. Over the past decade despite an annual GDP growth rate of 7 to 10%, the economy has been unable to meet the ever increasing demand for new jobs (MOLSA 2009). This was partly attributed to an influx of young graduates as a result of increase in the intake capacity of universities in Ethiopia and partly due to urbanization which increased the supply of labor in the formal sector of the economy. In order for the economy to be able to absorb this abundant labor force, the government of Ethiopia has been advocating the development of labor intensive small scale industries. Technical, financial and regulatory support has been given to this sector. But, the fact is employment or under employment, especially urban unemployment, is expected to exist in the coming years owing to increased number of graduates and to the low new job generating capacity of the economy.

Table 2 TRENDS IN URBAN UNEMPLOYMENT IN ETHIOPIA

	Urban unemployment rates for selected years				
Unemployment Indicators	2003	2004	2006	2009	2010
Both sexes	26.2	22.9	26.7	20.4	18.9
Male	17.6	5.8	11.5	12.2	11
Female	35.2	30.6	22.1	29.6	27.4

Source: (MOFED 2011)

4. METHODOLOGY

4.1 UNIT OF ANALYSIS

The unit of analysis used for this study is an establishment which is defined, according to CSA, as "…the whole of premises under the same ownership or management at a particular address" (CSA 2012, 15). Only manufacturing establishments with 10 or more employees that use power driven machinery and obtain their electricity from EEPCO are included.

4.2 TIME PERIOD

The time period in which the survey was conducted by CSA and is used for the purpose of this study totals 15 years which starts in the year 1996 and ends in the year 2011.

For the purpose of investigating how flows in the level of employment vary by employer size and other firm characteristics, different measures of employer size, job flows and other firm or industry characteristics were used. Concepts and definitions of them are given below.

4.3 EMPLOYER SIZE

There are different ways of measuring size of a firm. Among other variables, sales, employment levels, market share, market capitalization can be mentioned. For the purpose of this study permanent employment levels of the firm were used to define its size class. For a reason mentioned below different measures of employment size were used. All the three measures can be defined at a firm or industry or any aggregate level.

Base Year Size: the base year size of a firm at time t is given by the level of the firm's employment at time t-1. It's given by

$$BYSjt = EMPTjt - 1 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{Equation (1)}$$

Where BYSjt is base year size of a firm or an industry or size group j at time t and EMPTt-1 is the employment level of the firm, or an industry or size group j at time t-1.

Using this measure to classify firms into classes, according to DHS, will bias our measure of job flows positively towards small firms. In other words, if we use base year employment to classify a firm into sizes groups, the statistical problem of regression fallacy will bias our results. When a firm faces temporary fluctuations in employment in a certain period or when there are measurement errors, smaller firms (which faced temporary decrease in their employment levels) are on average to increase their size in the following periods and larger firms (which faced temporary increase in their employment levels) are likely to decrease their size in the following years (regressing to their means). This results in job flows estimates that positively favor smaller firms. DHS proposed another measures of employer size to reduce or avoid this regression to the mean bias.

Average size: the average size of a firm at time t is given by the simple arithmetic mean of the firm's employment level at time t and t-1. It's given by

$$\mathrm{ASjt} = (\mathrm{EMPTjt} + \mathrm{EMPTjt} - 1)/2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{Equation } (2)$$

Where ASjt is the average size of a firm or an industry or size group j and EMPTjt and EMPTjt-1 are employment levels of a firm or an industry or size group j at year t and t-1 respectively.

Long-run Size: is given by the average of employment levels of the firm observed throughout the survey period. It's given by

$$\mathrm{LRSjt} = \frac{\mathrm{EMPTjt} - \mathrm{t} - 1 + \mathrm{EMPTjt} - \mathrm{t} - 2 + \cdots .\mathrm{EMPTjt} - 1 + \mathrm{EMPTjt} + \mathrm{EMPTjt} + 1 + \mathrm{EMPTjt} + 2 + \ldots + \mathrm{EMPTjt} + \mathrm{n} - \mathrm{t}}{\mathrm{n}}$$

$$\mathrm{LRSjt} = \frac{\sum_{\mathrm{i=t-t-1}}^{\mathrm{t+\,n-t}} \mathrm{EMPTji}}{\mathrm{n}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{Equation } (3)$$

Where LRSjt is the long run size of firm j at time t and EMPTji is the employment level of firm j at different I time points and n stands for the total number of years firm j is observed in CSA's database.

4.4 FIRM AGE

Age of firms was computed using the reported date of commencement of each establishment. But, for analytical purposes two measures of age were employed. One measure of age, Base Year Age, takes the age of the firm at the initial year of analysis. The other measure of age, Average Age, takes the average of the firm's age between the two years of analysis. Here, the years of analysis are any two successive years for which the firm's employment change are measured. If a firm is reported to commence operations at year say K then, the Base Year Age of the firm at year "t" is simply t-1-K. Similarly, the Average Age of the firm at year "t" is 0.5*(t-1-K + t-K).

4.5 INDUSTRIAL CLASSIFICATION

In order to classify firms into their industrial groups, the International Standard Industrial Classification (ISIC) was used. The CSA uses ISIC Revision 3.1 to classify firms into their parent industries. Four digit ISIC codes of for each firm is obtained from CSA's database. In this study for analytical purposes firms was classified into industrial groups by using both the two digit and four digit ISIC codes by making use of ISIC Revision 3.1 whenever it was deemed necessary.

4.6 MEASURES OF JOB FLOWS

The measures of job flows used in this paper were obtained following DHS 1996 measures of Gross Job Creation (GJC), Gross Job Destruction (GJD) and Net Job creation (NJC).These three measures are defined at aggregate level and not at the individual level. In order to

define the concepts of the three measures, it's better to start with the concepts of expansion, contraction, exit and entry.

Expansion: a firm is said to expand between time t and t-1, if the number of employees of the firm at time t exceeds that of t-1.

Contraction (Decline): a firm is said to decline between time t and t-1, if the number of employees of the firm at time t is less than that of t-1.

Entry: a firm is said to enter the industry at time t, if the firm is established at the year t and is included in CSA's database at the survey year t.

Exit: a firm is said to exit the industry at time t, if a firm that is observed at time t does not appear in CSA's database or survey for the remaining survey years[1].

Gross Job Creation: measures the number of jobs created by expanding and entering firms. In order to express it at rate we simply divide it by its respective measure of size. It is defined at aggregate level.

$$\text{GJCjt} = \frac{\text{sum of new jobs in expanding firms in group j at t} + \text{sum of jobs created by entering firms in grouop j at time t}}{\text{Measure of size of group j}}$$

$$\mathbf{GJCjt} = \frac{\sum_{\text{xi}\in\text{j}}^{\text{n}} \text{EMPTxit} - \text{EMPTxit} - 1 + \sum_{\text{ei}\in\text{j}}^{\text{m}} \text{EMPTeit}}{\sum_{\text{xi}\in\text{j}}^{\text{n}} \text{EMPTxit} - 1 + \sum_{\text{ei}}^{\text{m}} \text{EMPTeit}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{Equation (4)}$$

Where, GJDjt stands for Gross Job Creation by group j at time t, EMPTxit and EMPTxit-1 stand for employment in those expanding firms at time t and t-1 respectively, EMPTeit stands for employment at year t new born firms. n and m stands for the total number of

[1] This concept of entry was used for the years between 1996 and 2009. For the remaining two years, 2010 and 2011, this concept of exit was modified since it the survey year ends at the year 2011. Firms who were observed in the database for only five or less years were considered to exit the industry for the years 2010 and 2011.

expanding and entering firms respectively. The measure of group size used in equation (4) employs the base year size method.

Gross Job Destruction: is defined in the same analogy as Gross Job Creation. It measures the total job loss by exiting and contracting firms.

$$\mathbf{GJDjt} = \frac{\sum_{ci\in j}^{p} \mathrm{EMPTcit} - \mathrm{EMPTcit} - 1 + \sum_{yi\in j}^{r} \mathrm{EMPTyit} - 1}{\sum_{ci\in j}^{p} \mathrm{EMPTcit} - 1 \; + \; \sum_{yi}^{r} \mathrm{EMPTyit} - 1} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{Equation (5)}$$

Where, GJDjt stands for Gross Job Destruction by group j at time t, EMPTcit and EMPTcit-1 stand for employment in contracting firms in year t and t-1, EMPTyit-1 is employment in exiting firms at time t-1, and p and r represent the total number of contracting and exiting firms.

Net Job Creation: is the sum of gross job creation and gross job destruction.

$$\mathbf{NJCjt} = \mathrm{GJCjt} + \mathrm{GJDjt} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{Equation (6)}$$

It can also be given by the difference in total employment of a certain group of firms in year t and t-1 relative to average size measure of that group.

$$\mathbf{NJCjt} = 2\left(\frac{\sum_{i\in j}^{N} \mathrm{EMPTit} - \sum_{i\in j}^{M} \mathrm{EMPTit} - 1}{\sum_{i\in j}^{N} \mathrm{EMPTit} + \sum_{i\in j}^{M} \mathrm{EMPTt} - 1}\right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(Equation 7)}$$

5. DATA

The data used for this paper was obtained from the database of the Central Statistics of Ethiopia (CSA). CSA conducts annual national survey on various socio-economic issues in the country, one being the survey on large and medium scale manufacturing and electricity industries. CSA has been conducting a survey on large and medium scale manufacturing and electricity establishments annually since the year 1976. This paper makes use of data on individual establishments that has been collected between the period 1996 and 2011.

The actual one Ethiopian fiscal year starts from July 8th to July 7th the next year according to the Gregorian calendar[2]. The survey covers a wide range of economic variables that includes establishment level employment figures at the firm level. It uses the International Standard Industrial Classification (ISIC Revision-3.1) to define and classify industries into groups. According to ISIC Revision-3.1, manufacturing is defined as

> "...the physical or chemical transformation of materials or components into new products, whether the work is performed by power-driven machines or by hand, whether it is done in a factory or in the worker's home, and whether the products are sold at wholesale or retail. The assembly of the component parts of manufactured products is also considered as a manufacturing activity" (CSA 2012).

The main advantage of this database lies in the fact that it tracks firms throughout the survey period. Some new firms are included in the survey and some firms are excluded from

[2] According to the Library of Congress , the Ethiopian year consists of 365 days which are divided into twelve months of 30 days each equally and one additional month of five or 6(once in leap years) days. New Year falls on the 11the of September and ends on the 10th of the next September when using the Gregorian calendar. Starting from September 11 to December 31, the Ethiopian year is 7 years behind the Gregorian year and thereafter 8 years behind the Gregorian calendar. This difference came from the difference in belief in the day of creation of the world between the Ethiopian Orthodox Church and the Roman Catholic Church (Library of Congress 2013).

the survey each year. But, it does not track firm birth and deaths, this being one of its disadvantages. The survey does not track mergers and acquisitions perhaps this is another disadvantage of the database. Entry and exit of firms was estimated in the way described in the analysis section of this paper.

The survey is conducted at the establishment or firm level and not at the plant level. The scope of the survey is limited to those establishments that engage ten persons or more, that use power driven machinery and whose electricity is supplied by the Ethiopian Electric Power Corporation. It covers both private and public establishments in all regions of the country. The process of selecting establishments that fulfill the criterion was done and annual updated by using the license issued by the Ethiopian Ministry of Trade and the Regional States' Trade Bureaus (CSA 2012).

6. DATA ANALYSIS

The general objective of this study is to find out if there are any firm or industry characteristics that enable firms to generate more jobs than others and to give a closer look at these characteristics. To aid this analysis, firms have been categorized into different classes based on their size of employment, age and industry. Using this classification differences in job generating capacity of firms is observed. The analysis proceeds as follows. The first two parts of this section of the study gives a descriptive summary on the distribution number of firms and their employment dynamics. Following the descriptive part, the pattern of transition, entry and exit across size and age class of firms is given. In section five, the result of the analysis on job flow rates across firm size/age is presented. The result of the econometric analysis is presented in a separate section.

6.1 SIZE DISTRIBUTION OF FIRMS

For various reasons the total number of firms surveyed by CSA varied from year to year. In general, this number increased annually, specifically from 610 firms in 1996 to 1875 firms in 2011. Some firms were observed for all survey years and some were observed for a single year. Due to exit in one side and unavailability of data for some firms for some years in the other side, all firms that were observed in the initial survey year could not be observed in the final survey year. Similarly, due to entry in one side and unavailability of data for some firms for some years in the other side, not all firms that are observed in the final survey year were observed in the initial survey year. The actual number of firms used for this study ranged between 586 firms in 1996 to 1789 firms in 2011. Some Observations were deleted for some firms if data was not available. Table 1 shows the distribution of the average number of firms across size classes.

As can be seen from the table, in all survey years, there were more firms with 20 or less employees (the group of firms represented by G1 in Table 1) than any other size class of firms. On average these firms accounted for 53% of all observed firms. Similarly, firms with more than 400 employees accounted on average for only 5% of all observed firms. If we take a cut off point of 100 employees, we find that firms with less than 100 employees accounted on average for 83% of all observed firms while firms with more than 100 employees took an average share of 17% of all observed firms.

Table 3 CROSSSECTIONAL AND TIME SERIES SIZE DISTRIBUTION OF NUMBER OF FIRMS

AVERAGE SIZE (AVERAGE NUMBER OF EMPLOYESS)	YEARS OF OBSERVATION									
	1996-1999		2000-2003		2004-2007		2008-2011		TOTAL AVERAGE 1996-2011	
	Number of firms (%)	Cumulative (%)	Number of firms (%)	Cumulative (%)	Number of firms (%)	Cumulative (%)	Number of firms (%)	Cumulative (%)	Number of firms (%)	Cumulative (%)
G1 ≤20	342 (53.1)	342 (53.1)	372 (51.1)	372 (51.1)	390 (44.1)	390 (44.1)	981 (58.7)	981 (58.7)	521 (53.1)	521 (53.1)
G2 20<G2≤40	100 (15.6)	442 (68.7)	114 (15.6)	486 (66.8)	164 (18.5)	553 (62.6)	251 (15)	1232 (73.8)	157 (16)	678 (69.1)
G3 40<G3≤60	35 (5.5)	477 (74.2)	58 (8)	544 (74.7)	85 (9.6)	638 (72.3)	117 (7)	1349 (80.7)	74 (7.5)	752 (76.7)
G4 60<G4≤100	36 (5.6)	513 (79.8)	45 (6.2)	589 (80.9)	74 (8.4)	712 (80.7)	106 (6.3)	1454 (87.1)	65 (6.6)	817 (83.3)
G5 100<G5≤150	31 (4.9)	544 (84.6)	33 (4.6)	622 (85.5)	42 (4.8)	754 (85.4)	59 (3.5)	1513 (90.6)	41 (4.2)	858 (87.5)
G6 150<G6≤200	20 (3.1)	564 (87.8)	22 (3)	644 (88.5)	30 (3.4)	784 (88.8)	41 (2.5)	1554 (93.1)	28 (2.9)	887 (90.4)
G7 200<G7≤300	19 (3)	584 (90.7)	25 (3.5)	669 (91.9)	30 (3.4)	814 (92.2)	44 (2.6)	1598 (95.7)	30 (3)	916 (93.4)
G8 300<G8≤400	12 (1.9)	596 (92.6)	11 (1.5)	680 (93.4)	22 (2.5)	836 (94.6)	23 (1.4)	1621 (97.1)	17 (1.7)	933 (95.1)
G9 >400	48 (7.4)	643 (100)	48 (6.5)	728 (100)	47 (5.3)	883 (99.9)	49 (2.9)	1670 (100)	48 (4.9)	981 (100)
TOTAL	643 (100)		728 (100)		883 (99.9)		1670 (100)		981 (100)	

SOURCE: CSA and own calculation.

NOTES:

- The numbers in bracket indicate the respective percentage share of each group.
- Average size of firms was used to compute the size class of firms.

In constructing Table 1 firms were categorized into different classes using the concept of Average size that was introduced in the methodology section of this paper. But, the

resulting distribution holds (even if there are some insignificant differences in the actual shares of each group) if any of the different measures of size were used instead. For example: if Base Year Size (Long Run Size) was used instead, the distribution stays the same though the actual size of shares of each group decreases (increases) as employment increases. But, using Average Size is helpful, as mentioned in the methodology section, when it comes to integrating exit and entry of firms into the analysis.

Figure 5 SIZE DISTRIBUTION OF NUMBER OF FIRMS

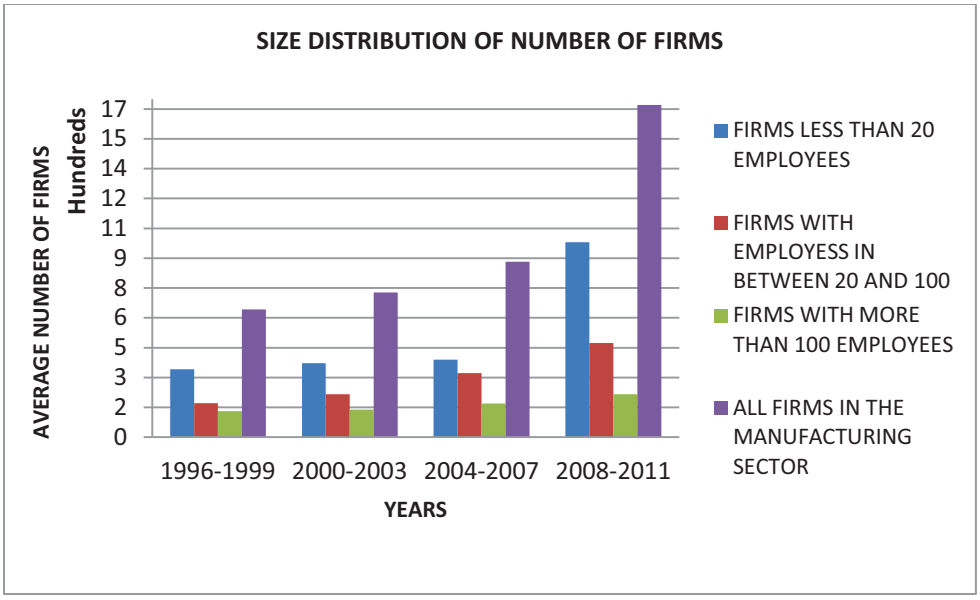
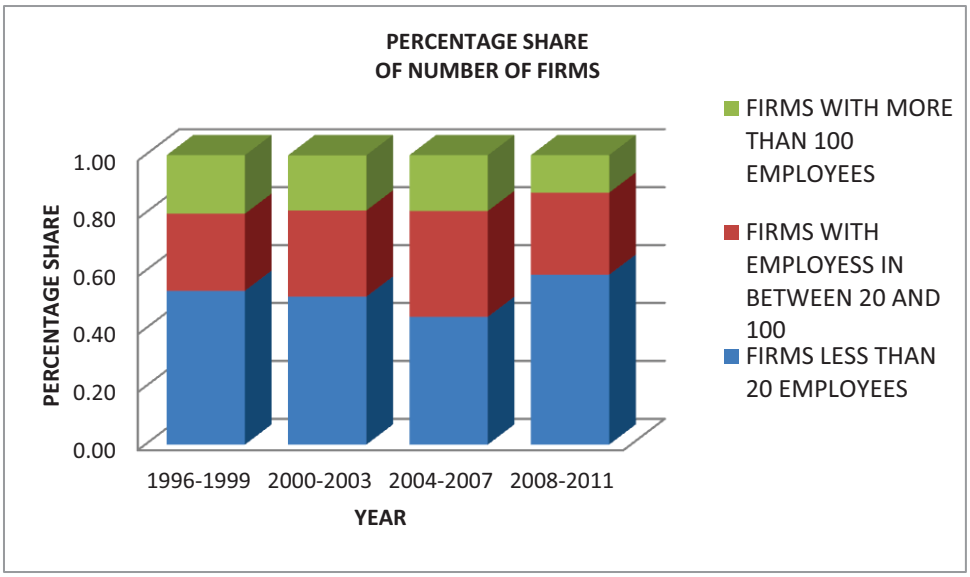


Figure 6 DISTRIBUTION OF NUMBER OF FIRMS ACROSS SIZE CLASSES



6.2 EMPLOYMENT DISTRIBUTION

Though there are a small number of large firms, they account for more than half of the total employment. The smaller firms, though they were large in number, account for a small share of total employment at any time. Firms with more than 400 employees account on average for 52% of total employment over the survey period, though they are on average only 5% of the total number of firms. On the other size, firms with less than 400 employees account on average to 48% of total employment though they account on average for 95% of total number of firms. This distribution of number of employees by size group is given in table2. If we consider 100 employees as a cut of point, firms with less than 100 employees account on average for about 83% of total number of firms but only to 20.1% of total employment.

Table 4 SIZE DISTRIBUTION OF NUMBER OF EMPLOYEES

AVERAGE SIZE	YEARS OF OBSERVATION									
	1996-1999		2000-2003		2004-2007		2008-2011		TOTAL AVERAGE	
	number of employees (%)	cumulative (%)	number of employees (%)	cumulative (%)	number of employees (%)	cumulative (%)	number of employees (%)	cumulative (%)	number of employees (%)	cumulative (%)
G1	3096 (4.5)	3096 (4.5)	3166 (4.4)	3166 (4.4)	3612 (4.2)	3612 (4.2)	6049 (6.3)	6049 (6.3)	3981 (4.9)	3981 (4.9)
G2	2799 (4.1)	5895 (8.6)	3119 (4.3)	6285 (8.7)	4730 (5.4)	8343 (9.6)	5864 (6.1)	11913 (12.3)	4128 (5.1)	8109 (10)
G3	1653 (2.4)	7548 (11)	2807 (3.9)	9091 (12.7)	4251 (4.9)	12594 (14.5)	5005 (5.2)	16917 (17.5)	3429 (4.2)	11537 (14.2)
G4	2699 (3.9)	10247 (15)	3539 (4.9)	12630 (17.6)	5759 (6.6)	18353 (21.1)	6993 (7.2)	23910 (24.7)	4747 (5.9)	16285 (20.1)
G5	3935 (5.8)	14182 (20.7)	3965 (5.5)	16595 (23.1)	5421 (6.2)	23774 (27.3)	6355 (6.6)	30265 (31.3)	4919 (6.1)	21204 (26.2)
G6	3376 (4.9)	17557 (25.7)	3727 (5.2)	20322 (28.3)	5155 (5.9)	28929 (33.3)	6295 (6.5)	36560 (37.8)	4638 (5.7)	25842 (31.9)
G7	4426 (6.5)	21983 (32.1)	6250 (8.7)	26572 (37)	7418 (8.5)	36347 (41.8)	10573 (10.9)	47133 (48.8)	7167 (8.9)	33009 (40.8)
G8	4085 (6)	26068 (38.1)	3708 (5.2)	30280 (42.1)	7486 (8.6)	43833 (50.4)	7597 (7.9)	54730 (56.6)	5719 (7.1)	38727 (47.8)
G9	42352 (61.9)	68419 (100)	41576 (57.9)	71856 (100)	43153 (49.6)	86986 (100)	41905 (43.4)	96635 (100)	42247 (52.2)	80974 (100)
TOTAL	68419 (100)		71856 (100)		86986 (100)		96635 (100)		80974 (100)	

SOURCE: CSA and own calculation

Notes:

The numbers in parenthesis indicate the percentage share of each firm's size of employees.

The Average Size method was used to compute the size of each firm.

An attempt has been made to show the patter of this distribution using the Lorenz curve as shown in figure 1. As the figures indicate and as portrayed in the Lorenz curve, over the survey period, at any point in time, large firms are the dominant employers and that small firms' share of total employment is small even though they are large in number. The abundance in the number of small sized firms did not add up to offset the excess share of total employment given by the advantage of operating in large scale. This might be, according to Brown and et.al, due to the fact that only some of the small firms grow and those who grow will expand until they are large. This adds to the employment share of large firms leaving the small firms' share of employment unchanged (Kirchhoff 1991). This can be verified by looking at the transition matrix of firms which will be given in the next section.

Figure 7 SIZE DISTRIBUTION OF NUMBER OF EMPLOYEES

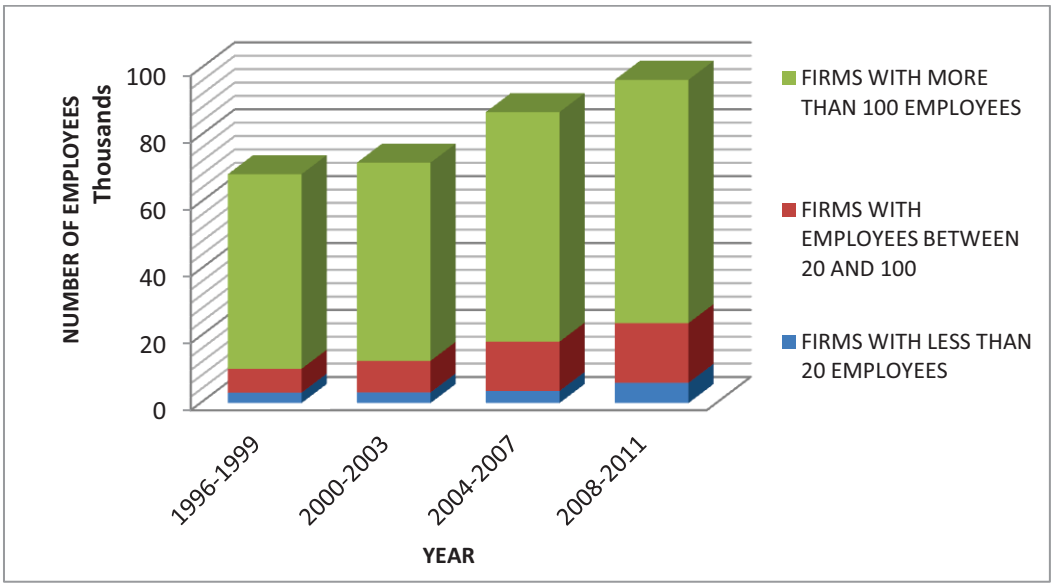
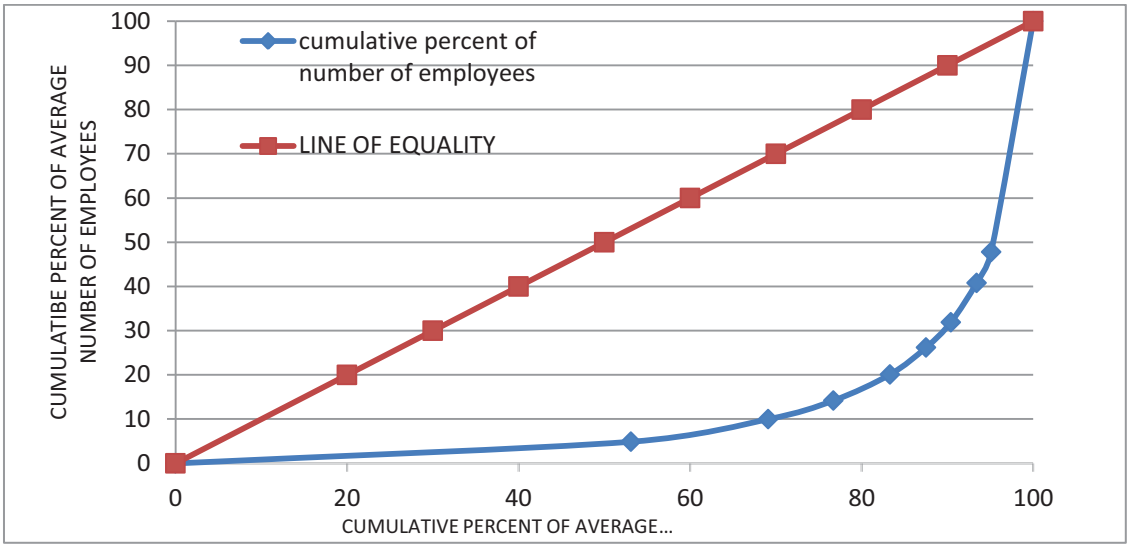


Figure 8 LORENZ CURVE (CUMULATIVE PERCENTAGE DISTRIBUTION OF EMPLOYMENT (1996-2011))



6.3 TRANSITION MATRIX

Since firms' were assigned into different classes using annual employment figures, there is the possibility for firms to switch between different size classes as firms expand or shrink. The switch between different size classes can be captured by looking at the transition matrix of firms which are given in Table 3 and 4. When we look at the switch between different size classes of firms which survived for the entire survey period (for 15 years), we find no strong evidence which supports the argument that small firms grow to become large firms. If we assume that the surviving firms are the only firms which grow, the probability that a small firm will grow and join the next size classes is given in parenthesis in table 3 and four. Out of 45 firms with 20 or less employees at the beginning of the survey, 4 (8.9%) of them grow and ended up in the 60 to 100 employees size group, only two (4.44) of them ended up in the 100 or more size group. Majority of these firms, 18 (40%), remained in the same size class while 15(33%) and 6 (13%) of them grow to join the 20 to 60 and 40 to 60 size groups respectively.

Assuming that 100 employees define a cutoff point between small and large firms, the probability that a small firm with 20 or less employees will grow and become a large firm (with 100 or more employees) is only 4%. Similarly, out of 25 firms which started the survey year with between 20 and 40 employees, one (4%) joined the group defined by 200 to 300 employees, another one the 150 to 200 employees group at the end of the survey year. Five of these firms (20%) stayed in the same group while 3 (12%), 4(16%) and 4 of them joined the size classes designated by G3, G4 and G5 respectively. In general, the probability that a firm in the size groups with less than 100 employees will join the size group one step ahead lies in the range 12% to 33%, while this figure lies in the range 5% to 33% for firms with more than 100 employees. We can also note the following points

- The probability of joining the next size class declines as we move from small to large in the ending size class for firms with 20 or less employees and for firms with employees in between 150 and 300.
- The probability that a firm in any size group will join the size group three or four steps ahead is less than that of joining the size group one step ahead. But, no clear pattern emerges between smaller and larger firms in the difference in probabilities of joining the size class one step ahead and size class three or four steps ahead.
- When considering short periods (2, 5 and 10 years), the transition probabilities from each class to another is on average smaller than the transition probabilities over longer period (15 years).
- When looking at the downsizing of firms we find similar patter where there is no clear difference in downsizing between smaller and larger firms.

The point of the above analysis was to find out if whether the switch in size class by firms is strong enough to explain why small firms' share of employment is unchanged or small even though they are large in number. What is concluded from this is that smaller firms are less likely to grow and join larger firms and as a result no evidence emerges as to why the

employment share of small firms remains unchanged or is significantly lower than that of large firms. But, it might be the case that the employment share of those firms who grow and join the large firms group (even though this probability of transition is small) may be strong enough to significantly reduce small firm's employment share.

Table 5 FIFTEEN YEARS SURVIVING FIRMS TRANSITION MATRIX

BEGINNING SIZE (1996)	ENDING SIZE (2010)									
	G1	G2	G3	G4	G5	G6	G7	G8	G9	TOTAL
G1	18 (0.400)	15 (0.333)	6 (0.133)	4 (0.089)	1 (0.022)	1 (0.022)	0 (0.000)	0 (0.000)	0 (0.000)	45 (1.000)
G2	7 (0.280)	5 (0.200)	3 (0.120)	4 (0.160)	4 (0.160)	1 (0.040)	1 (0.040)	0 (0.000)	0 (0.000)	25 (1.000)
G3	3 (0.200)	1 (0.067)	4 (0.267)	5 (0.333)	0 (0.000)	1 (0.067)	1 (0.067)	0 (0.000)	0 (0.000)	15 (1.000)
G4	1 (0.050)	2 (0.100)	4 (0.200)	6 (0.300)	3 (0.150)	0 (0.000)	1 (0.050)	3 (0.150)	0 (0.000)	20 (1.000)
G5	1 (0.056)	0 (0.000)	3 (0.167)	6 (0.333)	4 (0.222)	1 (0.056)	1 (0.056)	1 (0.056)	1 (0.056)	18 (1.000)
G6	0 (0.000)	0 (0.000)	0 (0.000)	5 (0.313)	3 (0.188)	2 (0.125)	5 (0.313)	0 (0.000)	1 (0.063)	16 (1.000)
G7	0 (0.000)	0 (0.000)	1 (0.067)	2 (0.133)	4 (0.267)	3 (0.200)	3 (0.200)	2 (0.133)	0 (0.000)	15 (1.000)
G8	0 (0.000)	0 (0.000)	0 (0.000)	2 (0.222)	0 (0.000)	1 (0.111)	0 (0.000)	3 (0.333)	3 (0.333)	9 (1.000)
G9	0 (0.000)	0 (0.000)	1 (0.024)	1 (0.024)	1 (0.024)	1 (0.024)	6 (0.146)	6 (0.146)	25 (0.610)	41 (1.000)
TOTAL	30 (0.147)	23 (0.113)	22 (0.108)	35 (0.172)	20 (0.098)	11 (0.054)	18 (0.088)	15 (0.074)	30 (0.147)	204 (1.000)

Table 6 FIVE YEAR SURVIVING FIRMS AVERAGE TRANSITION MATRIX

BEGINNING SIZE	ENDING SIZE									
	G1	G2	G3	G4	G5	G6	G7	G8	G9	TOTAL
G1	128 (0.727)	34 (0.193)	8 (0.045)	4 (0.022)	1 (0.007)	0 (0.002)	0 (0.002)	0 (0.001)	0 (0.001)	176 (1.000)
G2	23 (0.246)	42 (0.457)	16 (0.173)	8 (0.087)	2 (0.020)	1 (0.011)	0 (0.004)	0 (0.001)	0 (0.001)	92 (1.000)
G3	4 (0.073)	11 (0.210)	21 (0.425)	10 (0.196)	2 (0.040)	1 (0.028)	1 (0.024)	0 (0.004)	0 (0.000)	50 (1.000)
G4	1 (0.030)	3 (0.073)	7 (0.166)	19 (0.459)	6 (0.151)	3 (0.062)	2 (0.045)	0 (0.005)	0 (0.009)	42 (1.000)
G5	0 (0.013)	1 (0.026)	2 (0.053)	9 (0.264)	13 (0.384)	5 (0.143)	3 (0.076)	1 (0.018)	1 (0.023)	34 (1.000)
G6	0 (0.004)	0 (0.005)	1 (0.038)	1 (0.029)	4 (0.210)	10 (0.476)	4 (0.176)	1 (0.052)	0 (0.010)	21 (1.000)
G7	0 (0.004)	0 (0.004)	1 (0.022)	1 (0.044)	1 (0.061)	3 (0.127)	11 (0.476)	5 (0.210)	1 (0.052)	23 (1.000)
G8	0 (0.000)	0 (0.007)	0 (0.007)	0 (0.014)	1 (0.043)	1 (0.057)	4 (0.307)	5 (0.386)	3 (0.179)	14 (1.000)
G9	0 (0.000)	0 (0.004)	0 (0.000)	0 (0.000)	1 (0.015)	1 (0.011)	1 (0.021)	5 (0.113)	39 (0.837)	47 (1.000)
TOTAL	156 (0.313)	91 (0.182)	55 (0.111)	52 (0.104)	32 (0.063)	25 (0.049)	26 (0.053)	18 (0.036)	45 (0.089)	499 (1.000)

6.4 PATTERN OF ENTRY AND EXIT

Two important factors that affect the job generation process in any industry are the dynamics of entry and exit. When firms enter the industry jobs are created and when they exit jobs are destroyed. Firms which are likely to exit the market are more likely to destroy jobs than firms that survive longer. Similarly, those new firms entering the market will create jobs and it is necessary to identify peculiar characteristics of these new firms. In this section some of the peculiar characteristics these entering and exiting firms are presented.

In this study firms were said to be born if they were observed in the survey in the same year they commenced operations. A firm is said to be born at year "t" if it started it commenced its operations at year t. As a result firms that were not observed in CSA's database before year "t" but were observed at year t were treated as entering the market at year "t". Similarly a firm is said to exit the market at year "t" if it was observed in the year "t-1" but is never observed in the following survey years under consideration.

6.4.1 ENTRY

Over the survey period (1997 to 2011) an average of 40 firms were born annually. The number of these new entrants increased at the latter years of the survey mainly because of the increase in the scope and sample size of CSA's survey (which can be seen from table 1). As a result many new and existing but new to the survey firms were included in the database. As it is shown in table 5, the average number of entrants increased from 23 in 1997/2000 period to 65 in the 2009/11 period. What is striking is that most of these new entrants are smaller firms and mainly firms with 20 or less employees. Out of the total average number of 40 entrants 30 of them (74.6%) were firms with 20 or less employees and the rest 10 firms were distributed in the remaining size classes where the last three size

categories had each a share of less than one percent. Over the entire survey period, on average 96% of new entrants were firms with 100 or less employees suggesting that a significant number of new entrants are smaller firms.

Table 7 SIZE DISTRIBUTION OF ENTRANTS (1997-2011)

SIZE DISTRIBUTION OF ENTERING FIRMS (1997-2011)										
	1997-2000		2001-2004		2005-2008		2009-2011		AVERAGE (1996-2011)	
SIZE	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)
G1	16 (70.0)	16 (70.0)	17 (90.8)	17 (90.8)	43 (77.8)	43 (77.8)	48 (74.7)	48 (74.7)	30 (74.6)	30 (74.6)
G2	4 (15.6)	19 (85.6)	3 (15.8)	20 (106.6)	8 (14.0)	51 (91.9)	10 (14.9)	58 (89.7)	6 (14.3)	36 (88.9)
G3	1 (2.2)	20 (87.8)	2 (9.2)	22 (115.8)	2 (3.2)	53 (95.0)	2 (2.6)	60 (92.3)	1 (3.5)	37 (92.4)
G4	1 (5.6)	21 (93.3)	2 (7.9)	24 (123.7)	1 (1.8)	54 (96.8)	2 (3.6)	62 (95.9)	1 (3.7)	39 (96.0)
G5	1 (3.3)	22 (96.7)	1 (2.6)	24 (126.3)	1 (1.8)	55 (98.6)	1 (1.0)	63 (96.9)	1 (1.8)	39 (97.8)
G6	0 (0.0)	22 (96.7)	0 (1.3)	24 (100.0)	0 (0.5)	55 (99.1)	1 (1.0)	63 (97.9)	0 (0.7)	40 (98.5)
G7	0 (1.1)	22 (97.8)	0 (0.0)	24 (100.0)	0 (0.5)	55 (99.5)	1 (1.0)	64 (99.0)	0 (0.7)	40 (99.2)
G8	0 (0.0)	22 (97.8)	0 (0.0)	24 (100.0)	0 (0.5)	55 (100.0)	0 (0.0)	64 (99.0)	0 (0.2)	40 (99.3)
G9	1 (2.2)	23 (100.0)	0 (0.0)	24 (100.0)	0 (0.0)	55 (100.0)	1 (1.0)	65 (100.0)	0 (0.7)	40 (100.0)
TOTAL	23		19		55		65		40	

Source: CSA and own calculation

Note: The numbers in parenthesis are the respective shares of each cell out of the total.

6.4.2 EXIT

I. FIRM SIZE AND EXIT

The average number of exiting firms increased, over the survey period, from 116 in 1996/99 period to 726 in the 2009/11 period. Table 6 shows the size distribution of average number of exiting firms. Once again the increase in the average number of exiting firms can be attributed to the increase in the size and scope of the sample at the latter years of the survey. The annual average number of exiting firms is 233 which is more than the average number of annual entrants which is 40 firms. The size distribution of exit follows similar

pattern to that of entry. Most of the exiting firms are small firms mainly firms with 20 or less employees and firms with employees in between 20 and 40 which account for about 71% and 30% of all exiting firms respectively. In general, over the entire survey period, firms in the upper size class account for a very small share of exiting firms where firms with 400 or more employees and firms with employees in between 300 and 400 workers accounted for only 3% and 0.6% of all exiting firms respectively. The large portion of exiting firms are concentrated in the size groups marked by 100 or less employees where on average they account for 93% of all exiting firms.

Table 8 SIZE DISTRIBUTION OF EXITING FIRMS (1996-2010)

SIZE DISTRIBUTION OF EXITING FIRMS (1997-2011)										
SIZE	1997-2000		2001-2004		2005-2008		2009-2011		AVERAGE (1996-2010)	
	NUMBER OF FIRMS %	CUMULATIVE %	NUMBER OF FIRMS %	CUMULATIVE %	NUMBER OF FIRMS %	CUMULATIVE %	NUMBER OF FIRMS %	CUMULATIVE %	NUMBER OF FIRMS %	CUMULATIVE %
G1	96 (82.7)	96 (82.7)	67 (76.2)	67 (76.2)	79 (63.3)	79 (63.3)	508 (70.0)	508 (70.0)	166 (71.3)	166 (71.3)
G2	11 (9.3)	107 (92.0)	12 (14.0)	79 (90.3)	23 (18.0)	102 (81.2)	87 (12.0)	595 (82.0)	30 (12.7)	196 (84.0)
G3	3 (2.6)	110 (94.6)	4 (4.6)	83 (94.8)	9 (7.2)	111 (88.4)	41 (5.7)	636 (87.7)	13 (5.4)	208 (89.4)
G4	3 (2.4)	112 (97.0)	2 (2.3)	85 (97.1)	5 (4.0)	116 (92.4)	31 (4.3)	668 (92.0)	9 (3.8)	217 (93.2)
G5	2 (1.5)	114 (98.5)	1 (1.1)	86 (98.3)	3 (2.4)	119 (94.8)	21 (2.9)	689 (94.9)	6 (2.5)	223 (95.7)
G6	1 (0.9)	115 (99.4)	0 (0.0)	86 (98.3)	2 (1.8)	121 (96.6)	11 (1.6)	700 (96.5)	3 (1.3)	226 (97.1)
G7	0 (0.0)	115 (99.4)	1 (1.1)	87 (99.4)	1 (0.8)	122 (97.4)	11 (1.5)	711 (98.0)	3 (1.1)	229 (98.2)
G8	0 (0.0)	115 (99.4)	0 (0.0)	87 (99.4)	1 (1.0)	123 (98.4)	6 (0.8)	717 (98.8)	1 (0.6)	230 (98.9)
G9	1 (0.6)	116 (100.0)	1 (0.6)	87 (100.0)	2 (1.6)	125 (100.0)	9 (1.2)	726 (100.0)	3 (1.1)	233 (100.0)
TOTAL	116		87		125		726		233	

Source: CSA and own calculations.

Note: The numbers in parenthesis represent percentages shares of the corresponding numbers.

ii. FIRM AGE AND EXIT

Over the survey period, the average age of an exiting firm was about 11 years with a standard deviation of 13 years. Most exiting firms were young with the age of 5 or less years.

The age distribution exiting firms is given in table 7. Older firms were less likely to exit. Firms with age of 5 or less years accounted annually on average for about 48% of all exiting firms while firms with the age of more than 20 years accounted for about 16.5% of all annually exiting firms. In each survey year, firms with the age of 10 or less years accounted for more than half of all exiting firms. These figures show that exiting firms are more likely to be younger in age.

Table 9 AGE DISTRIBUTION OF EXITING FIRMS

DISTRIBUTION OF EXITING FIRMS BY AGE GROUP												
AGE GROUP (IN YEARS)	1997-1999		2000-2002		2003-2005		2006-2008		2009-2011		AVERAGE (1997-2011)	
	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)
G1 (G1≤5)	43 (39.2)	43 (39.2)	45 (42.1)	45 (42.1)	33 (38.1)	33 (38.1)	48 (35.2)	48 (35.2)	389 (53.7)	389 (53.7)	112 (47.9)	112 (47.9)
G2 5<G2≤10	20 (18.4)	64 (57.5)	23 (22.0)	68 (64.1)	20 (23.0)	52 (61.1)	38 (28.1)	86 (63.3)	104 (14.3)	493 (67.9)	41 (17.2)	153 (65.6)
G3 10<G3≤15	12 (11.1)	76 (68.7)	8 (7.2)	76 (71.4)	8 (9.3)	60 (70.4)	18 (13.5)	104 (76.9)	91 (12.6)	584 (80.5)	28 (11.3)	180 (77.4)
G4 15<G4≤20	11 (9.6)	87 (78.3)	8 (7.2)	83 (78.6)	4 (5.1)	65 (75.5)	8 (5.9)	112 (82.8)	41 (5.7)	625 (86.2)	14 (6.2)	194 (83.5)
G5 20<G5≤30	13 (12.0)	100 (90.4)	14 (12.9)	97 (91.5)	12 (13.6)	76 (89.1)	7 (5.4)	119 (88.2)	32 (4.4)	657 (90.6)	16 (6.7)	210 (90.3)
G6 30<G6≤50	10 (9.3)	110 (99.7)	8 (7.5)	105 (99.1)	8 (9.3)	84 (98.4)	14 (10.1	133 (98.3)	54 (7.4)	711 (98.0)	19 (8.1)	229 (98.3)
G7 50<G7≤100	0 (0.3)	111 (100)	1 (0.9)	106 (100)	1 (1.6)	86 (100)	2 (1.7)	135 (100)	14 (2.0)	726 (100)	4 (1.7)	233 (100)
TOTAL	111 (100)		106 (100)		86 (100)		135 (100)		726 (100)		233 (100)	

Source: CSA and own calculation

iii. REGRESSING AGE AND SIZE OF FIRMS ON THE PROBABILITY OF EXIT

Firms in smaller in size and younger in age were found to exit more likely than larger or older firms. A regression analysis was made to see the effect of age and size on the probability of a firm to exit. A logistic model of the following form was used

$$Pi = E(Y = 1/X_{1i}, X_{2i}, X_{3i}) = \beta 1 + \beta 2\,(X_{1i}) + \beta 3\,(X_{2i}) + \beta 4\,(X_{3i})$$

$$Li = (Pi/1 - Pi) = \beta 1 + \beta 2\,(\text{Base Year Employment}) + \beta 3(\text{Base Year Age}) + \beta 4(\text{Base year age} * \text{Employment}) + \mu i$$

Where Pi is the probability of a firm exiting and 1-Pi is the probability of a firm not exiting, Y takes a value of 1 if the firm exits and 0 other wise.

(Pi/1-Pi) is the ratio of the probability of a firm exiting to the probability of a firm not exiting (Gujarati 2003).

The logistic regression of the above model yields the following results

Table 10 LOGISTIC REGRESSION OF THE PROBABILITY OF EXIT ON SIZE AND AGE OF FIRMS

Dependent variable probability of Exit	Coefficients	Robust standard Errors	Z
Base Year Employment	-0.0038	0.001	-3.56
Base Year Age	-0.034	0.0019	-17.57
Interaction between Size and Age	0.00004	0.00002	2.14
Constant	0.5551	0.0433	-12.82
Other Statistics			
Number of observations	15109		
Wald Chi Square (3)	504.01		
Probability > Chi square	0.00		
Pseudo R square	0.0559		
Log pseudo likelihood	-7709.61		

As it is given in table 8, the coefficients for size and age are negative suggesting that size or age of a firm is negatively related with its probability of exit. As a firm's size/age increases, its probability of exit decrease. For an increase in number of employees by 10 more employees, the probability of exit is likely to increase 9.9 times (antilog of -0.0038 is about 0.99). Similarly for every 10 year increase in the age of firms, the probability of exit is on average 9.6 times higher (antilog of -0.034 is about 0.96). As a result it can be said that smaller or younger firms are more likely to exit than larger/older firms.

6.5 PATTERN OF JOB FLOW RATES

6.5.1 JOB FLOW RATES AND SIZE OF FIRMS

Using the concepts of measures of job flows introduced in the methodology section, the rates of job creation, destruction net job creation associated with each size class was estimated using the conventional and DHS growth rate measures. These estimates are shown in tables 7 to 10.

The manufacturing sector in general destroyed more jobs than it created over the survey period. The average annual rate of gross job destruction for the manufacturing sector was 9.8% where its counter destruction rate was 16.8% leaving a negative net job creation rate of 6.9%. Except for the 2003/5 time period, the sector's average rate of gross job destruction exceeded its average rate of gross job creation. For the 2003/5 time period the sector's average rate of GJC and GJD was 9.2% and 7.7%, leaving a positive net job creation rate of 1.5%. This pattern was the same all measures of size and growth rate except for the conventional growth rate measure where there were some expected quantitative discrepancies in the estimates of job flows. But, the qualitative results remain unchanged.

The distribution of the rates of job flows across firms of different size has some interesting patterns. The DHS rates of job creation are in general higher for smaller firms. Specifically, rate of GJC is the highest for firms with 20 or less employees for all time periods when base year size of firms is used. For all measures of size, the average rate of GJC is the highest for the first two size classes (firms in the size groups marked with 40 or less employees) and the lowest for the last three size classes (firms with 200 or more employees). The average rate of GJC was never fall below 17% for the first two size classes and never exceeded 10% for the last three size classes for all measures of size. Specifically, the average GJC rate for firms

with 20 or less employees was 30.2%, 20.4 % and 17.9 when using Base Year Size, Average Size and Long Run Size of firms respectively while these figures were 6.5% and 7.7% and 7.5% respectively for firms with 400 or more employees. What is concluded from these facts is that, smaller firms have higher rates of gross job creation than larger firms.

Similarly, the rate of job destruction was also higher for smaller firms. More importantly, it was the highest for firms with 20 and less employees for all time periods considered. Over the survey period, the average GJD never fall below 25% for firms in the first two size classes (firms with 40 or less employees) and never exceeded 15% for firms in the last two size classes (firms with 300 or more employees). When using Base Year, Average and Long Run size of firms, the average rate of gross job destruction for firms with 20 or less employees was 36.5%, 53.1% and 45.1% respectively while these figures were 13.%, 10.6% and 12.9 respectively for firms with 400 or less employees. From this we can conclude that smaller firms are not only important job creators, but also important job destroyers.

When we bring these patterns of job creation and destruction together, we find that on the net level all firms, regardless of size classes, on average destroyed more jobs than they created. When these net job creation rates are compared between firms of different size, some ambiguities arise. If firms were classified using their Base Year Size, we find that the negative rate of net job creation (which is job destruction) was relatively higher for large firms. This suggests that large firms destroy more jobs than smaller firms when firms are classified using their Base Year Size. But, when firms were classified using their Average and Long Run Sizes, we find that the rate of net job creation was relatively higher for smaller firms, where it was found that the smaller firms destroy more jobs than larger ones.

Table 11 DISTRIBUTION OF DHS GROWTH RATES ACROSS BASE YEAR FIRM SIZE CLASSES

DISTRIBUTION OF DHS GROWTH RATES OF GROSS JOB CREATION, DESTRUCTION AND NET JOB CREATION (1996-2011)																		
BASE YEAR SIZE	1997-1999			2000-2002			2003-2005			2006-2008			2009-2011			AVERAGE (1997-2011)		
	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC
G1	0.245	-0.354	-0.110	0.264	-0.300	-0.035	0.357	-0.221	0.136	0.358	-0.234	0.124	0.286	-0.714	-0.428	0.302	-0.365	-0.063
G2	0.154	-0.221	-0.066	0.147	-0.252	-0.105	0.197	-0.145	0.053	0.198	-0.219	-0.021	0.217	-0.432	-0.215	0.183	-0.254	-0.071
G3	0.115	-0.191	-0.076	0.130	-0.207	-0.078	0.118	-0.122	-0.005	0.157	-0.166	-0.009	0.218	-0.429	-0.212	0.147	-0.223	-0.076
G4	0.156	-0.168	-0.013	0.141	-0.158	-0.017	0.171	-0.111	0.060	0.185	-0.171	0.014	0.162	-0.421	-0.259	0.163	-0.206	-0.043
G5	0.064	-0.123	-0.059	0.124	-0.128	-0.005	0.163	-0.079	0.085	0.201	-0.158	0.043	0.179	-0.435	-0.256	0.146	-0.185	-0.038
G6	0.049	-0.135	-0.086	0.065	-0.066	-0.001	0.095	-0.069	0.027	0.100	-0.212	-0.113	0.131	-0.341	-0.210	0.088	-0.165	-0.077
G7	0.061	-0.077	-0.017	0.031	-0.132	-0.101	0.065	-0.093	-0.028	0.116	-0.145	-0.029	0.095	-0.364	-0.269	0.074	-0.162	-0.089
G8	0.021	-0.048	-0.027	0.033	-0.116	-0.083	0.051	-0.069	-0.018	0.055	-0.155	-0.099	0.066	-0.286	-0.221	0.045	-0.135	-0.090
G9	0.015	-0.078	-0.063	0.024	-0.085	-0.060	0.041	-0.047	-0.006	0.103	-0.149	-0.046	0.141	-0.316	-0.176	0.065	-0.135	-0.070
TOTAL	0.048	-0.107	-0.059	0.060	-0.116	-0.056	0.092	-0.077	0.015	0.136	-0.160	-0.024	0.156	-0.378	-0.223	0.098	-0.168	-0.069

Table 12 DISTRUBUTION OF DHS GROWTH RATE ACROSS AVERAGE FIRM SIZE CLASSES

DISTRIBUTION OF DHS GROWTH RATES OF GROSS JOB CREATION, DESTRUCTION AND NET JOB CREATION																		
AVERAGE SIZE	1997-1999			2000-2002			2003-2005			2006-2008			2009-2011			AVERAGE (1997-2011)		
	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC
G1	0.194	-0.477	-0.283	0.178	-0.457	-0.279	0.225	-0.361	-0.136	0.261	-0.417	-0.156	0.162	-0.945	-0.783	0.204	-0.531	-0.327
G2	0.169	-0.171	-0.001	0.171	-0.261	-0.091	0.228	-0.132	0.096	0.149	-0.247	-0.097	0.130	-0.581	-0.450	0.170	-0.278	-0.109
G3	0.116	-0.263	-0.146	0.145	-0.178	-0.034	0.138	-0.130	0.008	0.134	-0.154	-0.020	0.134	-0.469	-0.335	0.133	-0.239	-0.106
G4	0.123	-0.196	-0.074	0.100	-0.138	-0.038	0.156	-0.091	0.065	0.154	-0.236	-0.082	0.160	-0.494	-0.334	0.139	-0.231	-0.093
G5	0.089	-0.066	0.024	0.078	-0.125	-0.046	0.160	-0.104	0.056	0.182	-0.186	-0.005	0.150	-0.490	-0.340	0.132	-0.194	-0.062
G6	0.065	-0.080	-0.015	0.050	-0.073	-0.023	0.158	-0.073	0.085	0.154	-0.191	-0.037	0.120	-0.381	-0.261	0.109	-0.160	-0.050
G7	0.041	-0.155	-0.114	0.081	-0.082	-0.001	0.068	-0.105	-0.036	0.144	-0.124	0.020	0.150	-0.230	-0.080	0.097	-0.139	-0.042
G8	0.042	-0.044	-0.003	0.024	-0.141	-0.117	0.075	-0.065	0.010	0.104	-0.128	-0.023	0.083	-0.239	-0.157	0.065	-0.124	-0.058
G9	0.017	-0.065	-0.049	0.031	-0.076	-0.044	0.044	-0.035	0.009	0.113	-0.120	-0.007	0.180	-0.235	-0.055	0.077	-0.106	-0.029
TOTAL	0.048	-0.107	-0.059	0.060	-0.116	-0.056	0.092	-0.077	0.015	0.136	-0.160	-0.024	0.156	-0.378	-0.223	0.098	-0.168	-0.069

Table 13 DISTRIBUTION OF DHS GROWTH RATES ACROSS LONG RUN FIRM SIZE CLASSES

DISTRIBUTION OF DHS GROWTH RATES GROSS JOB CREATION, DESTRUCTION AND NET JOB CREATION																		
LONG RUN SIZE	1997-1999			2000-2002			2003-2005			2006-2008			2009-2011			AVERAGE (1997-2011)		
	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC
G1	0.154	-0.435	-0.281	0.165	-0.406	-0.240	0.192	-0.322	-0.130	0.220	-0.301	-0.081	0.161	-0.793	-0.632	0.179	-0.451	-0.273
G2	0.155	-0.222	-0.067	0.157	-0.283	-0.126	0.227	-0.147	0.080	0.166	-0.219	-0.053	0.152	-0.474	-0.322	0.171	-0.269	-0.098
G3	0.156	-0.179	-0.023	0.131	-0.169	-0.038	0.143	-0.117	0.027	0.140	-0.187	-0.047	0.108	-0.466	-0.358	0.136	-0.224	-0.088
G4	0.111	-0.140	-0.029	0.133	-0.213	-0.079	0.174	-0.116	0.057	0.171	-0.196	-0.025	0.231	-0.430	-0.199	0.164	-0.219	-0.055
G5	0.068	-0.130	-0.061	0.119	-0.113	0.006	0.154	-0.114	0.041	0.193	-0.215	-0.022	0.161	-0.427	-0.266	0.139	-0.200	-0.061
G6	0.047	-0.106	-0.059	0.031	-0.089	-0.058	0.112	-0.065	0.047	0.133	-0.136	-0.003	0.148	-0.359	-0.212	0.094	-0.151	-0.057
G7	0.056	-0.052	0.004	0.053	-0.099	-0.046	0.092	-0.080	0.012	0.115	-0.118	-0.003	0.115	-0.265	-0.150	0.086	-0.123	-0.037
G8	0.052	-0.051	0.001	0.057	-0.143	-0.086	0.108	-0.096	0.012	0.157	-0.127	0.030	0.082	-0.314	-0.232	0.091	-0.146	-0.055
G9	0.020	-0.079	-0.059	0.034	-0.076	-0.043	0.046	-0.039	0.006	0.109	-0.144	-0.036	0.168	-0.303	-0.135	0.075	-0.129	-0.053
TOTAL	0.048	-0.107	-0.059	0.060	-0.116	-0.056	0.092	-0.077	0.015	0.136	-0.160	-0.024	0.156	-0.378	-0.223	0.098	-0.168	-0.069

Table 14 DISTRIBUTION OF CONVENTIONAL GROWTH RATES ACROSS BASE YEAR FIMR SIZE CLASSES

DISTRIBUTION OF CONVENTIONAL GROWTH RATES OF GROSS JOB CREATION, DESTRUCTION AND NET JOB CREATION																		
BASE YEAR SIZE	1997-1999			2000-2002			2003-2005			2006-2008			2009-2011			AVERAGE (1997-2011)		
	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC	GJC	GJD	NJC
G1	0.232	-0.336	-0.103	0.260	-0.294	-0.033	0.383	-0.237	0.146	0.383	-0.249	0.133	0.242	-0.569	-0.327	0.300	-0.337	-0.037
G2	0.150	-0.213	-0.064	0.139	-0.239	-0.100	0.206	-0.148	0.058	0.197	-0.216	-0.020	0.196	-0.386	-0.189	0.178	-0.240	-0.063
G3	0.111	-0.182	-0.071	0.127	-0.198	-0.071	0.118	-0.122	-0.004	0.157	-0.166	-0.009	0.208	-0.380	-0.173	0.144	-0.210	-0.066
G4	0.157	-0.165	-0.007	0.142	-0.154	-0.011	0.180	-0.113	0.067	0.187	-0.172	0.015	0.144	-0.364	-0.220	0.162	-0.193	-0.031
G5	0.062	-0.118	-0.055	0.125	-0.128	-0.004	0.173	-0.082	0.090	0.206	-0.161	0.045	0.163	-0.377	-0.214	0.146	-0.173	-0.028
G6	0.049	-0.128	-0.080	0.068	-0.064	0.003	0.097	-0.069	0.029	0.095	-0.201	-0.106	0.118	-0.297	-0.179	0.085	-0.152	-0.066
G7	0.061	-0.076	-0.015	0.029	-0.125	-0.096	0.066	-0.091	-0.025	0.116	-0.143	-0.027	0.083	-0.311	-0.227	0.071	-0.149	-0.078
G8	0.021	-0.048	-0.027	0.033	-0.109	-0.076	0.051	-0.068	-0.017	0.053	-0.144	-0.091	0.060	-0.249	-0.189	0.043	-0.123	-0.080
G9	0.015	-0.075	-0.061	0.024	-0.082	-0.059	0.041	-0.047	-0.006	0.103	-0.140	-0.037	0.132	-0.272	-0.140	0.063	-0.123	-0.060
TOTAL	0.047	-0.104	-0.057	0.059	-0.113	-0.054	0.093	-0.078	0.015	0.135	-0.157	-0.022	0.141	-0.329	-0.189	0.095	-0.156	-0.061

When using the BYS of firms, both the DHS rates of GJC and GJD were quite high for smaller firms and the resulting NJC was small. But, these job flow rates are expected to be higher for smaller firms when using Base Year Size of firms than when using Average or Long Run size of firms. This is due to the well known Regression to the Mean problem.

But, in the same manner when using the Average Size of firms, the rates of job creation is small compared to the rates of job destruction for smaller firms and the resulting net job creation rates are expected to be negative and high. This arises because whenever firms in a certain year and size class exit or face significant decline, they are more likely to be classified in the lower size classes in the following years of analysis than in the upper size classes (since the average of an initial number and another lower number is always lower than the initial number) which will increase (decrease) the rate of job destruction for smaller firms (larger firms). Similarly, when firms in a certain year and size class grow or enter that size class, they are more likely to join upper size classes in the following years of analysis because of the fact that the average of an initial number and another higher number is always higher than the initial number. As a result it is expected that the use of the Average or Long Run (Base Year) size of firms will result in job flow rates that positively favor the roles of larger (smaller) firms.

The use of other measures of size besides the Base Year size was considered as a result of the Regression to the Mean problem (as is pointed out by DHS)[3]. But, I think, this problem does not

[3] When firms face temporary fluctuations in the level of business activity, assigning firms to different size classes based on their Base Year Size will result in estimates of job flows that favor smaller firms. This comes from the fact that those firms which faced temporary increase (decrease) in their business activity in certain year (base year) will probably respond to this temporary change by decreasing (increasing) their level of business activity for the following years. As a result firms that were operating in smaller (larger) scale in the base year will probably operate in larger (smaller) scale in the following years i.e. they regress towards their normal (mean) scale of operation.

exist for all firms and for all times. Not all firms face transitory fluctuations in business activity for all years. Changes in the volume of business activity by firms and as a result changes in the level of employment is in many cases planned. If firms face these fluctuations it will only be for some years and for some firms. As a result, the actual or desired scale of operation by firms will be observed if we have data on scale of operation for long periods of time. But, data for firms, in this study, was not complete for all firms for reasons like entry and exit of firms among other things.

It is important to identify the role of entry and exit in job flows in the present context. If the higher rates of job creation and destruction are associated with high rates expansion and decline of firms, we can have a better picture of who is creating more new jobs (at the net level). Since the data for these surviving firms (expanding or exiting firms) is available and we can tell whether the growth or decline of these firms is persistent over time or transitory or unique over cross section of a certain type of firms. In this case, the type of the particular measure of size used will not significantly affect the resulting job flow rates if growth is observed for a long period. To achieve this, the pattern of job flow rates is decomposed into entry and exit and expansion and decline in the following section of this study.

6.5.2 DECOMPOSTION OF GROSS JOB FLOW RATES

Though there were high rates of firm entry, the role of entry in gross job creation was lower than gross job creation by expanding firms. For all the periods of the study gross job creation by entry was smaller than gross job creation by expanding firms. But, the rate of gross job creation

by entry was higher for smaller firms and this was expected since most of the born firms were smaller. Table 11 shows the distribution of gross job creation by entering and new born firms.

On average the rate of gross job creation as a result of entry was 1.5% while that of expansion was 8.7%. Entry gross job creation for firms with 20 or less employees was 5.5% while this figure was just 0.4% for firms with more than 400 employees. Most of the new jobs were created by expanding firms. Gross job creation as a result of expansion was on average less than 10% for firms in the size groups marked by more than 150 employees while this figure was on average more than 12% for firms in the first four size classes (firms with 150 or less employees). Particularly gross job creation of expanding firms was on average 24.7% for firms with 20 or less employees while this figure was 6% for firms with 400 or more employees. These figures show that the higher rate of gross job creation for smaller firms comes mainly from expanding firms. The role of new born firms on gross job creation is in general small and it is relatively higher for smaller firms.

Unlike entry, exit plays an important role in generating gross job destruction. On average the rate of gross job destruction as a result of decline and exit of firms was 8.1% and 8.7% respectively. But, these two figures vary greatly at size class levels. As it is shown in Table 12, the rate of job destruction as a result of exit was higher for smaller firms and lower for larger firms. It ranged between 10-28% for firms in the first five size classes (firms with less than 150 employees) and was between 5-8% for firms in the last three size classes. But, job destruction rate of declining firms was not that different for small and large firms.

Table 15 DECOMPOSITION OF GROSS JOB CREATION RATES BY ENTERING AND EXPANDING FIRMS

DISTRIBUTION OF ENRTY AND EXIT GROSS JOB CREATION RATES																		
	1997-1999			2000-2002			2003-2005			2006-2008			2009-2011			AVERAGE (1997-2011)		
BYS	EXGJC	ENGJC	GJC	EXGJC	ENGJC	GJC	EXGJC	ENGJC	GJC	EXGJC	ENGJC	GJC	EXGJC	ENGJC	GJC	EXGJC	ENGJC	GJC
G1	0.194	0.051	0.245	0.234	0.031	0.264	0.329	0.027	0.357	0.252	0.106	0.358	0.229	0.058	0.286	0.247	0.055	0.302
G2	0.119	0.035	0.154	0.127	0.020	0.147	0.171	0.026	0.197	0.147	0.051	0.198	0.178	0.039	0.217	0.148	0.034	0.183
G3	0.093	0.022	0.115	0.106	0.024	0.130	0.105	0.012	0.118	0.139	0.019	0.157	0.201	0.017	0.218	0.129	0.019	0.147
G4	0.114	0.041	0.156	0.126	0.015	0.141	0.148	0.023	0.171	0.172	0.013	0.185	0.140	0.022	0.162	0.140	0.023	0.163
G5	0.044	0.020	0.064	0.116	0.007	0.124	0.147	0.016	0.163	0.175	0.026	0.201	0.168	0.011	0.179	0.130	0.016	0.146
G6	0.049	0.000	0.049	0.065	0.000	0.065	0.082	0.013	0.095	0.090	0.010	0.100	0.117	0.015	0.131	0.080	0.008	0.088
G7	0.043	0.018	0.061	0.031	0.000	0.031	0.065	0.000	0.065	0.106	0.011	0.116	0.077	0.018	0.095	0.064	0.009	0.074
G8	0.021	0.000	0.021	0.033	0.000	0.033	0.035	0.016	0.051	0.055	0.000	0.055	0.066	0.000	0.066	0.042	0.003	0.045
G9	0.005	0.010	0.015	0.024	0.000	0.024	0.041	0.000	0.041	0.103	0.000	0.103	0.129	0.012	0.141	0.060	0.004	0.065
TOTAL	0.033	0.015	0.048	0.056	0.004	0.060	0.084	0.008	0.092	0.122	0.014	0.136	0.138	0.018	0.156	0.087	0.012	0.098

Table 16 DECOMPOSITON OF GROSS JOB DESTRUCTION RATES BY EXITING AND DECLINING FIRMS

BYS	1997-1999			2000-2002			2003-2005			2006-2008			2009-2011			AVERAGE (1997-2011)		
	DGJD	XGJD	GJD	DGJD	XGJD	GJD	DGJD	XGJD	GJD	DGJD	XGJD	GJD	DGJD	XGJD	GJD	DGJD	XGJD	GJD
G1	-0.101	-0.254	-0.354	-0.097	-0.203	-0.300	-0.066	-0.155	-0.221	-0.073	-0.161	-0.234	-0.062	-0.652	-0.714	-0.080	-0.285	-0.365
G2	-0.119	-0.101	-0.221	-0.121	-0.131	-0.252	-0.081	-0.064	-0.145	-0.086	-0.133	-0.219	-0.087	-0.345	-0.432	-0.099	-0.155	-0.254
G3	-0.097	-0.093	-0.191	-0.115	-0.092	-0.207	-0.070	-0.052	-0.122	-0.077	-0.090	-0.166	-0.088	-0.342	-0.429	-0.089	-0.134	-0.223
G4	-0.104	-0.064	-0.168	-0.103	-0.055	-0.158	-0.077	-0.034	-0.111	-0.090	-0.081	-0.171	-0.117	-0.304	-0.421	-0.098	-0.108	-0.206
G5	-0.080	-0.042	-0.123	-0.078	-0.051	-0.128	-0.061	-0.018	-0.079	-0.085	-0.073	-0.158	-0.114	-0.321	-0.435	-0.084	-0.101	-0.185
G6	-0.087	-0.048	-0.135	-0.047	-0.018	-0.066	-0.069	0.000	-0.069	-0.120	-0.092	-0.212	-0.102	-0.239	-0.341	-0.085	-0.079	-0.165
G7	-0.077	0.000	-0.077	-0.108	-0.024	-0.132	-0.074	-0.019	-0.093	-0.105	-0.040	-0.145	-0.118	-0.246	-0.364	-0.096	-0.066	-0.162
G8	-0.048	0.000	-0.048	-0.116	0.000	-0.116	-0.069	0.000	-0.069	-0.088	-0.067	-0.155	-0.089	-0.197	-0.286	-0.082	-0.053	-0.135
G9	-0.066	-0.012	-0.078	-0.077	-0.007	-0.085	-0.043	-0.004	-0.047	-0.095	-0.053	-0.149	-0.103	-0.214	-0.316	-0.077	-0.058	-0.135
TOTAL	-0.074	-0.033	-0.107	-0.085	-0.031	-0.116	-0.057	-0.021	-0.077	-0.091	-0.070	-0.160	-0.100	-0.279	-0.378	-0.081	-0.087	-0.168

One important point worth mentioning here is that exiting firms' job destruction rate was on average higher than declining firms' job destruction rate for firms in the first five size classes while the reverse is true for firms in the last three size classes. What these figures tell us is that smaller firms' higher job destruction rates come mainly from their higher exit rate.

6.5.3 JOB FLOW RATES AND AGE OF FIRMS

In addition to size, age of firms also affects the dynamics of firm growth. As it was shown in section 4.1 of this study, young firms are more likely to exit than older firms. The effect of age on the pattern of job flow rates is given in this section.

Over the survey period, the rate of gross job creation is higher for younger firms than older firms. On average the job creation rate for firms with the age of 5 or less years and with the age range of 5 to 10 years was 21.4% and 13.8% respectively. This figure was 8.2% and 5.4% for firms in the age range of 30 to 50 years and 50 to 100 years respectively. Job creation rate for firms with the age of 15 or more years was on average less than 10%. The age distribution of job flow rates is given in table 14.

Similarly the gross job destruction rate was higher for younger firms. On average over the study period, the job destruction rate was never less than 16% for firms with the age of 15 or less years and this figure was never higher than 15% for firms with the age of 15 or more years. But, on the net level there was no direct relationship between the age of a group of firms and their respective net job creation rates.

There was some positive correlation between size and age of firms. Smaller firms tended to be younger in age while larger firms tended to be older in age. It was also found that younger firms

tended to be smaller in size and older firms tended to be larger in size. In table 15 the age-size relationship of firms is given.

Table 17 RELATHIONSHIP BETWEEN SIZE AND AGE OF FIRMS

AVERAGE AGE OF FIRMS BY EMPLOYMNET SIZE GROUP										
SIZE GROUP (NUMBER OF EMPLOYEES)	G1 G≤20	G2 20<G≤40	G3 40<G≤60	G4 60<G≤100	G5 100<G≤150	G6 150<G≤200	G7 200<G≤300	G8 300<G≤400	G9 G>400	TA
AVERAGE AGE	12	16	19	22	24	28	28	37	42	18

AVERAGE NUMBER OF EMPLOYEES BY AGE GROUP

AGE GROUP (YEARS)	G1 (G1≤5)	G2 (5<G2≤10)	G3 (10<G3≤15)	G4 (15<G4≤20)	G5 (20<G5≤30)	G6 (30<G6≤50)	G7 (50<G3≤100)	TOTAL AVERAGE
AVERAGE EMPLOYMENT	34	53	63	51	73	189	337	89

From this Size-age relationship, it can be said that the high gross job creation rate of younger firms comes from, among other things, from the fact that younger firms are smaller in size and that most entering firms are small. On the other hand, the high job destruction rate of younger firms comes from the fact that, among other things, younger firms are more likely to exit than older firms.

Table 18 DISTRIBUTION OF GROSS JOB FLOW RATES BY AGE GROUPS

DISTRIBUTION OF GROSS JOB FLOW RATE OVER AGE GROUP OF FIRMS																		
AGE GROUP (IN YEARS)	1997-1999			2000-2002			2003-2005			2006-2008			2009-2011			AVERAGE (1997-2011)		
	JCR	JDR	NJC	JCR	JDR	NJC	JCR	JDR	NJC	JCR	JDR	NJC	JCR	JDR	NJC	JCR	JDR	NJC
G1 G1≤5	0.20	-0.21	-0.01	0.12	-0.21	-0.09	0.24	-0.12	0.12	0.29	-0.22	0.07	0.23	-0.54	-0.31	0.21	-0.26	-0.04
G2 5<G2≤10	0.04	-0.17	-0.13	0.19	-0.18	0.02	0.14	-0.09	0.05	0.17	-0.18	-0.01	0.15	-0.41	-0.27	0.14	-0.21	-0.07
G3 10<G3≤15	0.04	-0.11	-0.08	0.03	-0.05	-0.02	0.08	-0.05	0.03	0.09	-0.16	-0.08	0.13	-0.43	-0.31	0.07	-0.16	-0.09
G4 15<G4≤20	0.04	-0.16	-0.12	0.06	-0.13	-0.07	0.04	-0.04	0.00	0.09	-0.09	0.00	0.12	-0.31	-0.19	0.07	-0.15	-0.08
G5 20<G5≤30	0.03	-0.08	-0.05	0.04	-0.07	-0.03	0.08	-0.10	-0.02	0.08	-0.10	-0.02	0.07	-0.37	-0.30	0.06	-0.14	-0.08
G6 30<G6≤50	0.03	-0.09	-0.06	0.02	-0.10	-0.07	0.05	-0.07	-0.02	0.11	-0.17	-0.06	0.19	-0.28	-0.09	0.08	-0.14	-0.06
G7 50<G7≤100	0.01	-0.06	-0.05	0.04	-0.09	-0.05	0.04	-0.06	-0.02	0.09	-0.12	-0.03	0.10	-0.24	-0.14	0.05	-0.11	-0.06
Total	0.05	-0.11	-0.06	0.06	-0.12	-0.06	0.09	-0.08	0.01	0.14	-0.16	-0.02	0.16	-0.38	-0.22	0.10	-0.17	-0.07

7. ECONOMETRIC ANALYSIS

From the analysis made in this section of the study, some evidence on the relationship between size or age and job flows rate of firms have been found. In this section the statistical significance of this relationship will be given.

The gross job creation and destruction rates are defined at a group level. For any year the rates of gross job creation or destruction are available for a group of firms. But, for any single firm and for any one year only either the gross job creation or the gross job destruction rate are available. To run a regression and see if the rates of job creation or destruction are significantly different for firms of certain size or age, some of the firms have to be excluded from the data for some years. As a result, running a firm level regression on the annual rate of job creation (destruction) requires leaving out data for some firms who destroyed (created) jobs.

7.1 REGRESSING JOB CREATION RATE ON SIZE AND AGE OF FIRMS

From the previous analysis, it was found that smaller firms created more jobs than larger firms. Similarly young firms created more jobs than older firms. To check the significance of the relationship between size or age and job creation rate of firms, the regression model shown below was used following Evans.

$$\ln S_{it} - \ln S_{it-1} = \beta_0 + \beta_1 \ln S_{it-1} + \beta_2 (\ln S_{it-1})^2 + \beta_3 \ln A_{it-1} + \beta_4 (\ln A_{it-1})^2 + \beta_5 (\ln S_{it-1} * \ln A_{it-1}) + \mathrm{GRDGP} + \mu_{it}$$

Where, ($\ln S_{it}$-$\ln S_{it-1}$) is employment growth rate of a job creating firm I between period t and t-1,
$\ln S_{it}$ is the natural logarithm of employment of firm I at time t

$\ln S_{it-1}$ is the natural logarithm of firm I at time t-1.

$\ln A_{it-1}$ is the natural logarithm of age of firm I at time t-1.

I denote only firms that created jobs between period t and t-1 and GDRGR is the annual growth rate of real GDP

Table 19 POOLED OLS REGRESSION ON POSITIVE EMPLOYMENT GROWTH RATE (JOB CREATION RATE)

Dependent variable positive employment growth rate (lnS_{it}-lnS_{it-1}>0)	Base year employment model (when Si is Base Year Employment)	Base Year Employment Model with dummy for size	Base year Employment model with dummy for age	Average Employment (when Si is Average Employment
$LnEmployment_{it-1}$	-0.5104* (0.0281)	-0.3944* (0.0226)	-0.1521* (0.008)	-0.2131* (0.0221)
$LnAge_{it-1}$	-0.1768* (0.018)	-0.0798* (0.0053)	-0.2187* (0.0175)	-0.1321* (0.013)
$(LnEmployment_{it-1})^2$	0.0619* (0.0041)			0.0224* (0.0036)
$(LnAge_{it-1})^2$	0.0542* (0.0046)			0.0274* (0.0042)
$LnEmployment_{it-1}$* $LnAge_{it-1}$	-0.0355* (0.0051)			-0.0146* (0.0051)
Real GDP Growth Rate	0.0051* (0.0012)	0.0048* (0.0013)	0.0042* (0.0014)	0.0021 (0.0015)
$LnEmployment_{it-1}$ * Empt Dummy 20 <Empt ≤ 40 Employees		0.0651* (0.0085)		
$LnEmployment_{it-1}$ * Empt Dummy 40 <Empt ≤ 100 Employees		0.1119* (0.0106)		
$LnEmployment_{it-1}$ * Empt Dummy 100 < Empt ≤ 200 Employees		0.1543* (0.0125)		
$LnEmployment_{it-1}$ *Empt Dummy Empt > 200 Employees		1.1923* (0.0142)		
$LnAge_{it-1}$* Age Dummy 5 < Age ≤ 10 years			0.0782* (0.0161)	
$LnAge_{it-1}$*Age Dummy 10<Age≤20 years			0.0963* (0.0161)	
$LnAge_{it-1}$* Age Dummy 20 < Age ≤ 30 years			0.1101* (0.0162)	
$LnAge_{it-1}$*Age Dummy Age > 30 years			0.1429* (0.0156)	
CONSTANT	1.6333* (0.0510)	1.6225* (0.0546)	1.1882* (0.0272)	1.1016* (0.0358)
R Squared	35.98%	32.1%	26.61%	17.7%
F test	335.1 (6, 2148)	201.24 (7, 2148)	202.3 (7, 2148)	329.76 (6, 2148)
Probability of > F	0.00	0.00	0.00	0.00
No of observations	4938	4938	4938	4938

Notes

- The numbers in parenthesis, except for the numbers in the row for F test are heteroscedastic robust standard errors of the coefficients.
- Coefficients with single * sign are significant at 5% significance level and coefficients with double * sign are significant at 10% level of significant. Coefficients with no * sign are not significant at 5% or 10% level of significant.

The result of the Pooled OLS regression method after adjusting for heteroscedasticity and serial correlation by use of robust standard error[4] estimators is given in Table 17.

In general, as can be seen from table 16, the pooled OLS regression results show that size and age of firms are negatively related with job creation rate. This is shown by the negative sign of the coefficients for size and age. This negative relationship between size/age of firms and job creation rate is convex as shown by the positive sign of the squared coefficients for size/age. This suggests that the negative relationship between size/age of firms and the job creation rate declines as size/age of firms increases. The coefficient for the effect of interaction between size and age of firms is also negative suggesting that firms which are small and young firms create more jobs than large and old firms. GDP growth rate is also positively related with job creation rate of firms.

When average employment of firms is used instead of base year employment, the qualitative relationship between size/age of firms is unchanged though the extent of the relationship and the explanatory power of the whole model are reduced. The coefficient for GDP growth rate was not significant at 5% or 10% level of significance when average employment of firms is used. The decrease in the extent of relationship between size/age of firms and their job creation rate might suggest that the regression bias is at work and is non negligible.

[4] Estimating pooled (panel) data with the usual OLS method is plagued with some problems. This comes from that fact that, according to Cameron, the pooled OLS does not take into account the panel nature of the data. The individual observations in panel data are usually correlated with the previous or future values of the error terms. This causes underestimated standard error values and inflated precision figures and t-statistics (Cameron 697).This can be adjusted by using robust standard errors in place of the usual OLS standard errors.

When dummy variables for size/age group of firms are introduced, interesting results emerge. Over all the qualitative conclusions remain the same after accounting for different size of firms by using dummy variables. But, it was interesting to see that the coefficients of lagged employment/age for different size/age groups are statistically different from that of the comparison size groups (that are given by firms with less than 20 employees for size group and firms with five or less years old for age group). If we move one step away from the comparison size/age group, we find that the size of the coefficient for lagged employment/age increases. This suggests that the relationship between size/age of firms and the job creation rate is stronger in the smaller size/younger age firm groups than larger size/older age firm groups. For a small percentage increase in size/age of firms, the resulting decrease in job creation rate is higher in smaller size/younger age firm groups than larger size/older age firm groups. In any size/age group of firms, it is the smaller/younger firms that create more jobs than larger/older firms. But, those smaller/younger firms in the first size/age classes create more jobs than their counterparts in the last size/age classes.

7.2 REGRESSING JOB DESTRUCTION RATES OF SIZE AND AGE OF FIRMS

Using the model described in section 6.1, the rate of job destruction was regressed on size, age of firms and other factors for firms that registered negative employment growth rate. Pooled OLS was used to estimate the coefficients.

The Pooled OLS regression results, given in table 17, of negative employment growth rate (or job destruction rate) on size and age of firms shows that, size of firms is negatively related with job destruction rate. This suggests that smaller firms indeed destroy more jobs than larger firms. This positive relationship between size of firms and job destruction rate is concave as shown by the negative coefficient for the squared lagged employment term. In

other words, the positive relationship between size and job destruction rate decreases as size of firms increases.

Table 20 POOLED OLS REGRESSION RESULTS ON NEGATIVE GROWTH RATE (JOB DESTRUCTION RATE)

Dependent variable negative employment growth rate (lnS_{it}-lnS_{it-1}<0)	Base year Employment model (when Si is Base Year Employment)	Base Year Employment model with dummy for size	Base Year Employment model with dummy for age	Average Employment model (when Si is Average Employment)
$LnEmployment_{it-1}$	0.17* (0.0119)	0.1222* (0.0086)	0.0988* (0.0046)	0.2069* (0.0103)
$LnAge_{it-1}$	0.0208 (0.0162)	0.0879* (0.0051)	0.0706* (0.0144)	0.0254* (0.0127)
$(LnEmployment_{it-1})^2$	-0.0187* (0.0021)			-0.0161* (0.0018)
$(LnAge_{it-1})^2$	-0.0052 (0.0044)			-0.0033 (0.0037)
$LnEmployment_{it-1}$* $LnAge_{it-1}$	0.2756* (0.0048)			0.01597* (0.004)
Real GDP Growth Rate	-0.0074* (0.0011)	-0.0074* (0.0011)	-0.0067* (0.0011)	-0.007* (0.001)
$LnEmployment_{it-1}$ * Empt Dummy 20 <Empt ≤ 40 Employees		0.0185* (0.0058)		
$LnEmployment_{it-1}$ * Empt Dummy 40 <Empt ≤ 100 Employees		-0.0002 (0.0063)		
$LnEmployment_{it-1}$ * Empt Dummy 100 < Empt ≤ 200 Employees		-0.011 (0.0075)		
$LnEmployment_{it-1}$ *Empt Dummy Empt > 200 Employees		-0.0184** (0.007)		
$LnAge_{it-1}$* Age Dummy 5 < Age ≤ 10 years			0.0158 (0.012)	
$LnAge_{it-1}$*Age Dummy 10<Age≤20 years			0.0002 (0.0121)	
$LnAge_{it-1}$* Age Dummy 20 < Age ≤ 30 years			0.021 (0.0128)	
$LnAge_{it-1}$*Age Dummy Age > 30 years			0.0161 (0.0126)	
CONSTANT	-1.1516* (0.0256)	-1.1891* (0.0199)	-1.1083* (0.0198)	-1.1846* (0.0199)
R Squared	20.35%	20.11%	19.69%	29.1%
F test	368.37 (6, 4228)	353.55 (7, 4228)		685.35 (6, 4228)
Probability of > F	0.00	0.00	0.00	0.000
No of observations	7988	7988	7988	7988

Notes

The numbers in parenthesis, except for the numbers in the row for F test are heteroscedastic robust standard errors of the coefficients.

Coefficients with single * sign are significant at 5% significance level and coefficients with double * sign are significant at 10% level of significant. Coefficients with no * sign are not significant at 5% or 10% level of significant.

In the model the effect of age on job destruction rate was found to be insignificant as 5% and 10% levels of significant. But, when the squared lagged terms or when the interaction term are dropped age was found to be positively related with job creation are at 5% level of significance. However, the interaction term for age and size of firms was significant in the original model suggesting that small and young firms destroy more jobs than large and old firms.

When Average Employment of firms is used in place of their Base Year Employment, the qualitative results remain the same except that age was also found to be negatively related with job destruction rate. Once again, the coefficients for lagged employment are higher when average employment is used suggesting that the regression bias is at work.

When dummy variables for size/age of firms in the alternative model are introduced, the relationship between size and job destruction rate remains unchanged. But the extent of this relationship for different groups of firm size was inconclusive. The same is true for age dummies, where no significant difference was found among different age groups. This may have implications on the difference between net job creation rates among different size/age groups since it was found that there is significant difference in job creation rate among different size groups. The next section reports the results of the regression analysis on net job creation.

7.3 REGRESSING NET JOB CREATION ON SIZE AND AGE OF FIRMS

In the previous two sections separate regressions was made on the rates of job creation and destruction by disaggregating firms into job creating and job destroying firms. This was done to see how the rates of job creation and job destruction vary with size and age of firms. In

this section the employment growth rate of all firms, including those firms that does not exhibit either growth or decline, was regressed on size, age and other variables.

Table 21 POOLED OLS REGRESSION RESULTS OF EMPLOYMENT GROWTH RATE FOR ALL FIRMS

Dependent variable Employment Growth Rate for all firms (lnS_{it}-lnS_{it-1})	Base Year Employment Model (when Si is Base Year Employment)	Base Year Employment Model with dummy for size	Base Year Employment Model with dummy for age	Average Employment Model (when Si is Average Employment)
$LnEmployment_{it-1}$	-0.1849* (0.0254)	-0.1825* (0.0208)	-0.0204* (0.0053)	0.3136* (0.0122)
$LnAge_{it-1}$	-0.1341* (0.0174)	-0.0018 (0.0048)	-0.1676* (0.0153)	-0.2924* (0.0119)
$(LnEmployment_{it-1})^2$	0.0295* (0.0036)			-0.031* (0.0018)
$(LnAge_{it-1})^2$	0.0519* (0.0038)			0.0583* (0.0028)
$LnEmployment_{it-1}$* $LnAge_{it-1}$	-0.0226* (0.0049)			0.0022 (0.0036)
Two digit Industry Growth Rate	0.6633* (0.0214)	0.6632* (0.0213)	0.6483* (0.0211)	0.5252* (0.0202)
$LnEmployment_{it-1}$ * Empt Dummy 20 <Empt ≤ 40 Employees		0.0582* (0.0074)		
$LnEmployment_{it-1}$ * Empt Dummy 40 <Empt ≤ 100 Employees		0.0836* (0.0096)		
$LnEmployment_{it-1}$ * Empt Dummy 100 < Empt ≤ 200 Employees		0.1037* (0.0116)		
$LnEmployment_{it-1}$ *Empt Dummy Empt > 200 Employees		0.1225* (0.0131)		
$LnAge_{it-1}$* Age Dummy 5 < Age ≤ 10 years			0.0933* (0.0121)	
$LnAge_{it-1}$*Age Dummy 10<Age≤20 years			0.1096* (0.0122)	
$LnAge_{it-1}$* Age Dummy 20 < Age ≤ 30 years			0.139* (0.0127)	
$LnAge_{it-1}$*Age Dummy Age > 30 years			0.157* (0.0126)	
CONSTANT	0.2906* (0.0484)	0.3255* (0.0502)	0.0926* (0.0213)	-0.4672* (0.0276)
R Squared	9%	8.25%	7.99%	15.34%
F test	224.78 (6, 4561)	161.31 (7, 4561)	182.26 (7, 4561)	598.79 (6, 4561)
Probability of > F	0.00	0.00	0.00	0.00
No of observations	15102	15102	15102	15102

Notes

The numbers in parenthesis, except for the numbers in the row for F test are heteroscedastic robust standard errors of the coefficients.

Coefficients with single * sign are significant at 5% significance level and coefficients with double * sign are significant at 10% level of significant. Coefficients with no * sign are not significant at 5% or 10% level of significant.

The Pooled OLS regression results of the model given in section 6.1 and the respective heteroscedastic robust standard errors of the coefficients is shown in table 18. This time all firms are used and instead of the GDPGR variable, an industry growth rate[5] variable was used.

The results of the Pooled OLS regression show that net employment growth rate is negatively related with size and age of firms. This is confirmed by the negative sign for the lagged employment and lagged age coefficients. This negative relationship is convex, as shown by the positive sign for the squared lagged coefficients of size and age, suggesting that the extent of the relationship decreases as size or age of firms increases. From this, it can be concluded that when using Base Year Employment of firms, smaller/ younger firms create more jobs than larger/older firms not only at a gross level but also at a net level.

When dummies for size and age are introduced the overall qualitative relationship remains the same. But, when introducing size dummies the coefficient for lagged age was insignificant. Over all the negative size/age to net employment growth rate relationship is stronger in the lower size/age groups that in the upper size/age groups. It holds for all groups of size/age but, relatively smaller/younger firms in the lower size/age groups have higher net employment growth rates than relatively smaller/younger firms in the upper size groups.

When using Average Employment/age of firms, the relationship between size and net employment growth rate is interestingly positive while the age-net employment growth rate relationship stays the same though it is stronger in the Average Employment Model. From

[5] An industry's growth rate at time t is simply the difference of the natural logarithm of total industry employment at time t and at time t-1. A two digit industry code was used to classify firms into industrial groups. This code was obtained from the International Standard Industry Classification Revision 3.1 and it's the benchmark for CSA classification as well.

this, it can be concluded that size-net employment growth rate relationship is sensitive to the choice of measure of size of firms. But, age of firms is negatively related with net employment growth rate regardless of the measure of age used.

7.4 SIZE/AGE-GROWTH RELATHIONSHIP ACROSS INDUSTRIAL GROUPS

By using the International Standard Classification of Industries (ISIC revision 3.1) firms were classified into different industrial groups. Separate regression was made for each industry to see if the relationship between size/age of firms holds in each industry. The results of the regression are not reported since there are too many industrial groups. Firms were classified into industrial groups using their four digit and two digit ISIC codes.

When Using the four digit ISIC codes, there were a total of 58 industrial groups. 17 Industrial groups in which the pooled time series and cross sectional number of observations was less than 30 were dropped. Separate regression was made for the remaining 41 industrial groups. Out of 41 industries, the negative relationship between size and net employment growth holds for only 11(27%) of the industries. The negative relationship between age and net employment growth holds for 13 (32%) of the 41 industries. The inconsistency, perhaps, might be due to the low size of pooled observations for each industrial group.

Similarly when using two digit ISIC codes, there were a total of 18 industrial groups and three were dropped. The negative relationship between size and net employment growth rate holds for 33% of the two digit industries. But, the negative age-net employment growth relationship holds for 53% of the two digit industrial groups.

8. CONCLUSION

The main conclusions of this study are given as follows.

- For any year though there are large number of small firms, their share in total employment is small and remains unchanged trough time.
- The probability that a smaller firm will grow and join the larger firm size class is very low. This suggested that the evidence for why the share of smaller firms in total employment remains unchanged (or is very low) couldn't be traced by looking solely at the transition probability of smaller firms.
- A significant number of new born firms are smaller in size and younger in age. In the same way most exiting firms are smaller in size and young in age. The probability of exit is higher for younger firms than older firms and smaller firms than larger firms.
- Smaller firms exhibit high gross job creation and destruction rates than larger firms. The high job creation rate for smaller firms came mainly from expanding firms than entering firms. This is in contrary to most findings where it was likely to see new born firms contributing significantly to high gross job creation rate than expanding firms. But, the high gross job destruction rate for smaller firms came mainly from loss of employment as a result of exit. However, the rate of gross job creation as a result of was higher for smaller firms.
- The result of the analysis on the rate of net employment creation showed that, the size-net job creation relationship is sensitive to the measure of size used. When Base Year Size of firms was used, smaller firms were found to

create more net jobs than larger firms. But, when Average Size of firms is used, larger firms created more jobs on the net level than smaller firms.

- Younger firm have high rates of gross job creation and gross job destruction rates than older firms. This was partly attributed to the fact that younger firms are smaller in size and smaller firms are younger in age.
- The results of the econometric analysis suggest that there is inverse relationship between size or age of firms and their net employment growth rate. After integrating industrial group of firms in the analysis, the inverse relationship between size and net employment growth rate holds for 33% of the two digit industrial groups and for 27% of four digit industrial groups. Similarly, the negative relationship between age and net employment growth rate holds for 53% of two digit industrial groups and for 32% of four digit industrial groups.
- The econometric analysis also confirmed that the size-net employment relationship is sensitive to the measure of firm size used. When Average size of firms is used there is positive relationship between size and net employment growth rate where as there was negative relationship between the two when Base Year Size of firms is used.

REFERENCES

Abegaz, Melaku T. "Total Factor Productivity and Technical Efficiency in the Ethiopian Manufacturing sector." *Ethiopian Development Reseacrh Institute working paper 10.* Addis Ababa: Department of Economics, Addis Ababa University, April 2013.

Central Statistics Authority of Ethiopia. *Large and Medium Manufacturing and Electricity Industries Suvey.* Report on Large and Medium Manufacturing and Electricity Industries Suvey , Addis Ababa: CSA, 2011.

Central Statistics Authority of Ethiopia. *Large and Medium Scale Manufacturing and Electricity Industries Survey.* Report on Large and Medium Scale Manufacturing and Electricity Industries Survey , Addis Ababa: CSA, 2012.

Davidsson P., Lindmark L., Olofsson C. "The extent of overestimation of small firm job creation:an empirical examination of the "regression bias"." *Small Business Economics, 10*, 1998: 87-100.

Enrico Santerelli, Luuk Klomp, A.Roy Thurik. "Gibrat,s law: An oveirview of empirical Literature." In *Entrepreneurship,growth and innovation: the dynamics of firms and industries*, 41-73. New York: Springer, 2006.

Ethiopian Economic Association. *Industrialization and Industrial Policy in Ethiopia.* Report on the Ethiopian Economy Volume III, Addis Ababa: EEE, 2004.

Gujarati, Damodar N. *Basic Econometrics 4th ed.* WestPoint: MacGrawHill, 2003.

Hart, P.E. "The Size and Growth of firms." *Economica, New Series, Vol.29, No.113*, 1962: 29-39.

Kirchhoff, Bruce A. "Employers Large and Small: A review article." *Small Business Economics, Vol. 3, No 3*, 1991: 233-238.

Landstrom, Hans. "David L Birch's contribution to Entrepreneurship and samll business reseacrh." *Global award for entrepreneurship reseacrh.* 1996.

Library of Congress, Federal Research Division. "Country profile of Ethiopia." *Library of Congress.* April 2005. http://lcweb2.loc.gov/frd/cs/profiles/Ethiopia.pdf (accessed August 27, 2013).

Mansfiled, Edwin. "Entry, Gibrat's law, Innovation and the Growth of firms." *The American Economic Review, Vol 52, No. 5*, 1962: 1023-1051.

MOFED. "Macro Economic Developments 2009/10." Annual Report on Macroeconomic Developments, Addis Ababa, 2011.

MOLSA. "National employment strategy and policy." *Ministry of Labor and Social Affair.* 2009. http://www.molsa.gov.et/English/EPro/Documents/National%20Employment%20Policy%20and%20Strategy%20of%20Ethiopia.pdf (accessed September 15, 2012).

NBE, National Bank Of Ethiopia. *Macro Economic and Social Indicators.* Annual report on the Ethiopian Economy, Addis Ababa: NBE, 2011.

Steven J. Davis, John Haltiwanger, Scot Schuh. "small business and job creation: dissecting the myth and reassessing the facts." *NBER working paper series, No. 4492.*

Sutton, John. "Gibrat's Legacy." *Journal of Economic Literature, Vol. 35, No 1*, 1997: 40-59.

The World Bank. *World DataBank/World Development Indicators.* August 2013. http://databank.worldbank.org/data/views/variableselection/selectvariables.aspx?source=world-development-indicators#s_m (accessed August 8, 2013).

Zoltan J. Acs, William Parsons and Spencer Tracy. "High-Impact Firms: Gazelles Revisited." The United States Small Business Adminstration, June 2008.

APPENDIX

In this section various statistical tables that have not been included in the main section of the study are given.

A. DISTRIBUTION OF NUMBER OF FIRMS ACROSS SIZE CLASSES AND OVER TIME

CROSS SECTIONAL AND TIME SERIES SIZE DISTRIBUTION OF FIRMS (1996-2003)																
SIZE	1996		1997		1998		1999		2000		2001		2002		2003	
	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS **(%)**	CUMULATIVE (%)
G1	297 (50.7)	297 (50.7)	336 (54.7)	336 (54.7)	365 (54.1)	365 (54.1)	369 (52.9)	369 (52.9)	375 (52.4)	375 (52.4)	340 (50.4)	340 (50.4)	335 (49.6)	335 (49.6)	439 (52.0)	439 (52.0)
G2	96 (16.4)	393 (67.1)	90 (14.7)	426 (69.4)	108 (16.0)	473 (70.1)	107 (15.3)	476 (68.2)	104 (14.5)	479 (67.0)	115 (17.0)	455 (67.4)	114 (16.9)	449 (66.4)	122 (14.4)	561 (66.4)
G3	31 (5.3)	424 (72.4)	33 (5.4)	459 (74.8)	31 (4.6)	504 (74.7)	46 (6.6)	522 (74.8)	57 (8.0)	536 (75.0)	48 (7.1)	503 (74.5)	51 (7.5)	500 (74.0)	76 (9.0)	637 (75.4)
G4	34 (5.8)	458 (78.2)	32 (5.2)	491 (80.0)	41 (6.1)	545 (80.7)	36 (5.2)	558 (79.9)	42 (5.9)	578 (80.8)	39 (5.8)	542 (80.3)	42 (6.2)	542 (80.2)	57 (6.7)	694 (82.1)
G5	30 (5.1)	488 (83.3)	28 (4.6)	519 (84.5)	32 (4.7)	577 (85.5)	35 (5.0)	593 (85.0)	33 (4.6)	611 (85.5)	34 (5.0)	576 (85.3)	33 (4.9)	575 (85.1)	33 (3.9)	727 (86.0)
G6	22 (3.8)	510 (87.0)	17 (2.8)	536 (87.3)	19 (2.8)	596 (88.3)	22 (3.2)	615 (88.1)	22 (3.1)	633 (88.5)	19 (2.8)	595 (88.1)	19 (2.8)	594 (87.9)	27 (3.2)	754 (89.2)
G7	18 (3.1)	528 (90.1)	20 (3.3)	556 (90.6)	21 (3.1)	617 (91.4)	18 (2.6)	633 (90.7)	17 (2.4)	650 (90.9)	24 (3.6)	619 (91.7)	29 (4.3)	623 (92.2)	31 (3.7)	785 (92.9)
G8	12 (2.0)	540 (92.2)	12 (2.0)	568 (92.5)	11 (1.6)	628 (93.0)	13 (1.9)	646 (92.6)	10 (1.4)	660 (92.3)	11 (1.6)	630 (93.3)	11 (1.6)	634 (93.8)	12 (1.4)	797 (94.3)
G9	46 (7.8)	586 (100)	46 (7.5)	614 (100)	47 (7.0)	675 (100)	52 (7.4)	698 (100)	55 (7.7)	715 (100)	45 (6.7)	675 (100)	42 (6.2)	676 (100)	48 (5.7)	845 (100)
Total	586 (100)		614 (100)		675 (100)		698 (100)		715 (100)		675 (100)		676 (100)		845 (100)	

CONTINUED

CROSS SECTIONAL AND TIME SERIES NUMBER AND SIZE DISTRIBUTION OF FIRMS (2004-2011)																
SIZE/YEAR	2004		2005		2006		2007		2008		2009		2010		2011	
	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)	NO OF FIRMS (%)	CUMULATIVE (%)
G1	414 (48.0)	414 (48.0)	269 (36.7)	269 (36.7)	269 (35.6)	269 (35.6)	606 (51.4)	606 (51.4)	738 (53.5)	738 (53.5)	950 (58.4)	950 (58.4)	1205 (63.9)	1205 (63.9)	1029 (57.5)	1029 (57.5)
G2	147 (17.0)	561 (65.0)	159 (21.7)	428 (58.4)	151 (20.0)	420 (55.6)	197 (16.7)	803 (68.2)	236 (17.1)	974 (70.6)	248 (15.3)	1198 (73.7)	237 (12.6)	1442 (76.4)	284 (15.9)	1313 (73.4)
G3	80 (9.3)	641 (74.3)	79 (10.8)	507 (69.2)	85 (11.2)	505 (66.8)	96 (8.1)	899 (76.3)	106 (7.7)	1080 (78.3)	127 (7.8)	1325 (81.5)	108 (5.7)	1550 (82.1)	126 (7.0)	1439 (80.4)
G4	67 (7.8)	708 (82.0)	66 (9.0)	573 (78.2)	78 (10.3)	583 (77.1)	86 (7.3)	985 (83.6)	99 (7.2)	1179 (85.5)	98 (6.0)	1423 (87.5)	104 (5.5)	1654 (87.7)	121 (6.8)	1560 (87.2)
G5	37 (4.3)	745 (86.3)	40 (5.5)	613 (83.6)	43 (5.7)	626 (82.8)	48 (4.1)	1033 (87.7)	50 (3.6)	1229 (89.1)	51 (3.1)	1474 (90.7)	63 (3.3)	1717 (91.0)	72 (4.0)	1632 (91.2)
G6	24 (2.8)	769 (89.1)	28 (3.8)	641 (87.4)	28 (3.7)	654 (86.5)	39 (3.3)	1072 (91.0)	42 (3.0)	1271 (92.2)	37 (2.3)	1511 (92.9)	45 (2.4)	1762 (93.4)	40 (2.2)	1672 (93.5)
G7	31 (3.6)	800 (92.7)	30 (4.1)	671 (91.5)	27 (3.6)	681 (90.1)	31 (2.6)	1103 (93.6)	36 (2.6)	1307 (94.8)	43 (2.6)	1554 (95.6)	47 (2.5)	1809 (95.9)	49 (2.7)	1721 (96.2)
G8	16 (1.9)	816 (94.6)	18 (2.5)	689 (94.0)	28 (3.7)	709 (93.8)	25 (2.1)	1128 (95.8)	23 (1.7)	1330 (96.4)	21 (1.3)	1575 (96.9)	24 (1.3)	1833 (97.1)	25 (1.4)	1746 (97.6)
G9	47 (5.4)	863 (100)	44 (6.0)	733 (100)	47 (6.2)	756 (100)	50 (4.2)	1178 (100)	49 (3.6)	1379 (100)	51 (3.1)	1626 (100)	54 (2.9)	1887 (100)	43 (2.4)	1789 (100)
TOTAL	863 (100)		733 (100)		756 (100)		1178 (100)		1379 (100)		1626 (100)		1887 (100)		1789 (100)	

B. DISTRIBUTION OF NUMBER OF EMPLOYEES ACROSS SIZE CLASSES AND OVER TIME

SIZE DISTRIBUTION OF EMPLOYMENT (1996-2003)																
SIZE	1996		1997		1998		1999		2000		2001		2002		2003	
	NUMBER (%)	CUMULATIVE (%)	NUMBER (%)	CUMULATIVE (%)	NUMBER (%)	CUMULATIVE (%)	NUMBER (%)	CUMULATIVE (%)	NUMBER (%)	CUMULATIVE (%)	NUMBER (%)	CUMULATIVE (%)	NUMBER (%)	CUMULATIVE (%)	NUMBER (%)	CUMULATIVE (%)
G1	3390 (5)	3390 (5)	2934 (4.5)	2934 (4.5)	2874 (4.4)	2874 (4.4)	3186 (4.2)	3186 (4.2)	3031 (4)	3031 (4)	2774 (4.1)	2774 (4.1)	2984 (4.4)	2984 (4.4)	3874 (5)	3874 (5)
G2	2618 (3.8)	6008 (8.8)	2513 (3.9)	5447 (8.4)	3031 (4.7)	5905 (9.1)	3034 (4)	6220 (8.2)	2820 (3.8)	5851 (7.8)	3066 (4.6)	5840 (8.7)	3031 (4.5)	6015 (8.8)	3558 (4.6)	7432 (9.7)
G3	1552 (2.3)	7560 (11.1)	1352 (2.1)	6799 (10.5)	1413 (2.2)	7318 (11.3)	2294 (3)	8514 (11.2)	2867 (3.8)	8718 (11.6)	2125 (3.2)	7965 (11.8)	2670 (3.9)	8685 (12.8)	3565 (4.6)	10997 (14.3)
G4	2664 (3.9)	10224 (15)	2366 (3.7)	9165 (14.2)	2950 (4.5)	10268 (15.8)	2816 (3.7)	11330 (14.9)	3012 (4)	11730 (15.6)	3144 (4.7)	11109 (16.5)	3421 (5)	12106 (17.8)	4577 (6)	15574 (20.3)
G5	3787 (5.6)	14011 (20.5)	3472 (5.4)	12637 (19.5)	4180 (6.4)	14448 (22.3)	4300 (5.7)	15630 (20.6)	4172 (5.6)	15902 (21.2)	4045 (6)	15154 (22.5)	3835 (5.6)	15941 (23.4)	3808 (5)	19382 (25.2)
G6	3681 (5.4)	17692 (25.9)	2834 (4.4)	15471 (23.9)	3303 (5.1)	17751 (27.3)	3685 (4.9)	19315 (25.5)	3708 (4.9)	19610 (26.1)	3186 (4.7)	18340 (27.2)	3354 (4.9)	19295 (28.3)	4659 (6.1)	24041 (31.3)
G7	4410 (6.5)	22102 (32.4)	4580 (7.1)	20051 (31)	4288 (6.6)	22039 (34)	4424 (5.8)	23739 (31.3)	4578 (6.1)	24188 (32.2)	6060 (9)	24400 (36.2)	7171 (10.5)	26466 (38.9)	7192 (9.4)	31233 (40.7)
G8	4054 (5.9)	26156 (38.3)	3988 (6.2)	24039 (37.1)	3853 (5.9)	25892 (39.9)	4444 (5.9)	28183 (37.2)	3467 (4.6)	27655 (36.8)	3613 (5.4)	28013 (41.6)	3403 (5)	29869 (43.9)	4348 (5.7)	35581 (46.3)
G9	42069 (61.7)	68225 (100)	40670 (62.9)	64709 (100)	39017 (60.1)	64909 (100)	47651 (62.8)	75834 (100)	47503 (63.2)	75158 (100)	39340 (58.4)	67353 (100)	38243 (56.1)	68112 (100)	41218 (53.7)	76799 (100)
Total	68225 (100)		64709 (100)		64909 (100)		75834 (100)		75158 (100)		67353 (100)		68112 (100)		76799 (100)	

CONTINUED

SIZE DISTRIBUTION OF EMPLOYMENT (2004-2011)																
SIZE	2004		2005		2006		2007		2008		2009		2010		2011	
	NO OF EMPLOYEES (%)	CUMULATIVE (%)	NO OF EMPLOYEES (%)	CUMULATIVE (%)	NO OF EMPLOYEES (%)	CUMULATIVE (%)	NO OF EMPLOYEES (%)	CUMULATIVE (%)	NO OF EMPLOYEES (%)	CUMULATIVE (%)	NO OF EMPLOYEES (%)	CUMULATIVE (%)	NO OF EMPLOYEES (%)	CUMULATIVE (%)	NO OF EMPLOYEES (%)	CUMULATIVE (%)
G1	4324 (5.2)	4324 (5.2)	2337 (2.9)	2337 (2.9)	2643 (3.1)	2643 (3.1)	5145 (5.2)	5145 (5.2)	7524 (7.9)	7524 (7.9)	7749 (7.7)	7749 (7.7)	4183 (3.9)	4183 (3.9)	4740 (5.8)	4740 (5.8)
G2	4602 (5.6)	8926 (10.8)	4724 (5.9)	7061 (8.8)	4362 (5.1)	7005 (8.2)	5233 (5.3)	10378 (10.4)	6356 (6.6)	13880 (14.5)	6510 (6.5)	14259 (14.1)	5258 (4.9)	9441 (8.8)	5330 (6.5)	10070 (12.3)
G3	4021 (4.9)	12947 (15.6)	4048 (5.1)	11109 (13.9)	4314 (5)	11319 (13.2)	4622 (4.6)	15000 (15.1)	5231 (5.5)	19111 (20)	5608 (5.6)	19867 (19.7)	4901 (4.5)	14342 (13.3)	4278 (5.2)	14348 (17.5)
G4	5466 (6.6)	18413 (22.2)	5436 (6.8)	16545 (20.7)	5617 (6.6)	16936 (19.8)	6517 (6.6)	21517 (21.6)	7466 (7.8)	26577 (27.8)	7608 (7.5)	27475 (27.2)	7132 (6.6)	21474 (19.9)	5766 (7)	20114 (24.5)
G5	4668 (5.6)	23081 (27.8)	5500 (6.9)	22045 (27.6)	5450 (6.4)	22386 (26.1)	6066 (6.1)	27583 (27.7)	6070 (6.3)	32647 (34.1)	5858 (5.8)	33333 (33)	7046 (6.5)	28520 (26.4)	6446 (7.9)	26560 (32.4)
G6	4181 (5)	27262 (32.9)	5118 (6.4)	27163 (34)	4498 (5.2)	26884 (31.4)	6824 (6.9)	34407 (34.6)	6737 (7)	39384 (41.1)	6309 (6.3)	39642 (39.3)	7008 (6.5)	35528 (32.9)	5127 (6.3)	31687 (38.7)
G7	7618 (9.2)	34880 (42.1)	7595 (9.5)	34758 (43.5)	6960 (8.1)	33844 (39.5)	7497 (7.5)	41904 (42.1)	9101 (9.5)	48485 (50.6)	10589 (10.5)	50231 (49.8)	12191 (11.3)	47719 (44.2)	10410 (12.7)	42097 (51.4)
G8	5580 (6.7)	40460 (48.8)	6604 (8.3)	41362 (51.8)	9404 (11)	43248 (50.4)	8357 (8.4)	50261 (50.5)	8162 (8.5)	56647 (59.2)	7051 (7)	57282 (56.8)	7589 (7)	55308 (51.3)	7584 (9.3)	49681 (60.6)
G9	42431 (51.2)	82891 (100)	38464 (48.2)	79826 (100)	42492 (49.6)	85740 (100)	49226 (49.5)	99487 (100)	39114 (40.8)	95761 (100)	43632 (43.2)	100914 (100)	52589 (48.7)	107897 (100)	32286 (39.4)	81967 (100)
TOTAL	82891 (100)		79826 (100)		85740 (100)		99487 (100)		95761 (100)		100914 (100)		107897 (100)		81967 (100)	

C. TWO YEARS SURVIVING FIRMS TRANSITION MATRIX

TWO YEARS SURVIVING FIRMS TRANSITION MATRIX										
BEGINNING SIZE	ENDING SIZE									
	G1	G2	G3	G4	G5	G6	G7	G8	G9	TOTAL
G1	473 (0.958)	19 (0.039)	1 (0.001)	0 (0.001)	0 (0.000)	0 (0.000)	0 (0.000)	0 (0.000)	0 (0.000)	493 (1.000)
G2	28 (0.181)	115 (0.734)	11 (0.070)	2 (0.013)	0 (0.002)	0 (0.000)	0 (0.000)	0 (0.000)	0 (0.000)	156 (1.000)
G3	1 (0.014)	13 (0.180)	51 (0.683)	8 (0.109)	1 (0.009)	0 (0.002)	0 (0.002)	0 (0.000)	0 (0.001)	74 (1.000)
G4	0 (0.007)	4 (0.057)	8 (0.126)	44 (0.705)	5 (0.083)	1 (0.016)	0 (0.006)	0 (0.000)	0 (0.000)	63 (1.000)
G5	0 (0.003)	0 (0.006)	1 (0.036)	6 (0.146)	27 (0.674)	4 (0.109)	1 (0.022)	0 (0.002)	0 (0.002)	40 (1.000)
G6	0 (0.002)	0 (0.002)	0 (0.009)	2 (0.079)	4 (0.146)	18 (0.649)	3 (0.108)	0 (0.002)	0 (0.002)	28 (1.000)
G7	0 (0.000)	0 (0.002)	0 (0.000)	0 (0.002)	2 (0.067)	2 (0.087)	21 (0.752)	2 (0.076)	0 (0.013)	28 (1.000)
G8	0 (0.000)	0 (0.000)	0 (0.000)	0 (0.000)	0 (0.008)	1 (0.034)	2 (0.146)	12 (0.709)	2 (0.103)	16 (1.000)
G9	0 (0.000)	0 (0.000)	0 (0.000)	0 (0.000)	0 (0.000)	0 (0.001)	1 (0.014)	2 (0.053)	43 (0.932)	46 (1.000)
TOTAL	502 (0.532)	151 (0.160)	72 (0.076)	63 (0.067)	40 (0.042)	27 (0.028)	28 (0.030)	16 (0.017)	45 (0.048)	944 (1.000)

D. TEN YEAR SURVIVING FIRMS TRANSITION MATRIX

TEN YEAR SURVIVING FIRMS TRANSITION MATRIX										
BEGINNING SIZE	ENDING SIZE									
	G1	G2	G3	G4	G5	G6	G7	G8	G9	TOTAL
G1	54 (0.555)	24 (0.247)	12 (0.119)	5 (0.048)	1 (0.014)	1 (0.007)	0 (0.002)	1 (0.005)	0 (0.003)	97 (1.000)
G2	13 (0.224)	21 (0.364)	12 (0.196)	8 (0.136)	2 (0.031)	1 (0.023)	2 (0.026)	0 (0.000)	0 (0.000)	59 (1.000)
G3	2 (0.077)	5 (0.185)	8 (0.268)	7 (0.250)	2 (0.083)	1 (0.036)	2 (0.065)	1 (0.024)	0 (0.012)	28 (1.000)
G4	1 (0.026)	2 (0.092)	6 (0.230)	8 (0.296)	5 (0.211)	2 (0.059)	1 (0.053)	1 (0.020)	0 (0.013)	25 (1.000)
G5	0 (0.006)	1 (0.037)	3 (0.093)	8 (0.309)	7 (0.241)	3 (0.111)	4 (0.136)	1 (0.037)	1 (0.031)	27 (1.000)
G6	0 (0.010)	0 (0.010)	1 (0.030)	2 (0.090)	4 (0.210)	8 (0.460)	2 (0.090)	1 (0.080)	0 (0.020)	17 (1.000)
G7	0 (0.000)	0 (0.000)	1 (0.028)	1 (0.047)	2 (0.094)	3 (0.170)	7 (0.387)	4 (0.217)	1 (0.057)	18 (1.000)
G8	0 (0.000)	0 (0.017)	1 (0.069)	1 (0.052)	1 (0.052)	1 (0.069)	2 (0.207)	3 (0.276)	3 (0.259)	10 (1.000)
G9	0 (0.000)	0 (0.000)	0 (0.004)	0 (0.007)	1 (0.025)	1 (0.029)	2 (0.047)	8 (0.167)	33 (0.720)	46 (1.000)
TOTAL	70 (0.215)	54 (0.166)	41 (0.125)	39 (0.119)	24 (0.074)	20 (0.062)	21 (0.065)	18 (0.056)	39 (0.119)	326 (1.000)

E. DISTRIBUTION OF NUMBER OF ENTERING FIRMS ACROSS SIZE CLASSES AND OVER TIME

SIZE DISTRIBUTION OF ENTRY (1997-2004)																
	1997		1998		1999		2000		2001		2002		2003		2004	
SIZE	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	NUMBER OF FIRMS (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)
G1	19 (67.9)	19 (67.9)	16 (76.2)	16 (76.2)	13 (59.1)	13 (59.1)	15 (78.9)	20 (54.1)	21 (100.0)	21 (100.0)	14 (60.9)	14 (60.9)	14 (87.5)	14 (87.5)	20 (14.1)	20 (14.1)
G2	3 (10.7)	22 (78.6)	2 (9.5)	18 (85.7)	6 (27.3)	19 (86.4)	3 (15.8)	9 (24.3)	0 (0.0)	21 (100.0)	3 (13.0)	17 (73.9)	0 (0.0)	14 (87.5)	20 (54.1)	20 (54.1)
G3	2 (7.1)	24 (85.7)	0 (0.0)	18 (85.7)	0 (0.0)	19 (86.4)	0 (0.0)	3 (8.1)	0 (0.0)	21 (100.0)	4 (17.4)	21 (91.3)	0 (0.0)	14 (87.5)	9 (24.3)	9 (24.3)
G4	2 (7.1)	26 (92.9)	2 (9.5)	20 (95.2)	1 (4.5)	20 (90.9)	0 (0.0)	2 (5.4)	0 (0.0)	21 (100.0)	2 (8.7)	23 (100.0)	2 (12.5)	16 (100.0)	3 (8.1)	3 (8.1)
G5	1 (3.6)	27 (96.4)	0 (0.0)	20 (95.2)	1 (4.5)	21 (95.5)	1 (5.3)	2 (5.4)	0 (0.0)	21 (100.0)	0 (0.0)	23 (100.0)	0 (0.0)	16 (100.0)	2 (5.4)	2 (5.4)
G6	0 (0.0)	27 (96.4)	0 (0.0)	20 (95.2)	0 (0.0)	21 (95.5)	0 (0.0)	1 (2.7)	0 (0.0)	21 (100.0)	0 (0.0)	23 (100.0)	0 (0.0)	16 (100.0)	2 (5.4)	2 (5.4)
G7	0 (0.0)	27 (96.4)	1 (4.8)	21 (100.0)	0 (0.0)	21 (95.5)	0 (0.0)	0 (0.0)	0 (0.0)	21 (100.0)	0 (0.0)	23 (100.0)	0 (0.0)	16 (100.0)	1 (2.7)	1 (2.7)
G8	0 (0.0)	27 (96.4)	0 (0.0)	21 (100.0)	0 (0.0)	21 (95.5)	0 (0.0)	0 (0.0)	0 (0.0)	21 (100.0)	0 (0.0)	23 (100.0)	0 (0.0)	16 (100.0)	0 (0.0)	0 (0.0)
G9	1 (3.6)	28 (100)	0 (0.0)	21 (100)	1 (4.5)	22 (100)	0 (0.0)	0 (0.0)	0 (0.0)	21 (100.0)	0 (0.0)	23 (100.0)	0 (0.0)	16 (100.0)	0 (0.0)	0 (0.0)
TOTAL	28 (100)		21 (100)		22 (100)		19 (100)	37 (100)	0 (0.0)	21 (100.0)	23 (100.0)		16 (100.0)		0 (0.0)	0 (0.0)

CONTINUED

SIZE DISTRIBUTION OF ENTRY (2005-2011)																
	2005		2006		2007		2008		2009		2010		2011		AVERAGE (1997-2011)	
SIZE	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)
G1	3 (33.3)	3 (33.3)	12 (46.2)	12 (46.2)	99 (86.8)	99 (86.8)	58 (80.6)	58 (80.6)	58 (75.3)	58 (75.3)	44 (78.6)	44 (78.6)	43 (70.5)	43 (70.5)	29.9 (77.3)	29.9 (77.3)
G2	4 (44.4)	7 (77.8)	11 (42.3)	23 (88.5)	10 (8.8)	109 (95.6)	6 (8.3)	64 (88.9)	10 (13.0)	68 (88.3)	9 (16.1)	53 (94.6)	10 (16.4)	53 (86.9)	5.7 (14.8)	35.7 (92.1)
G3	0 (0.0)	7 (77.8)	0 (0.0)	23 (88.5)	4 (3.5)	113 (99.1)	3 (4.2)	67 (93.1)	3 (3.9)	71 (92.2)	0 (0.0)	53 (94.6)	2 (3.3)	55 (90.2)	1.4 (3.6)	37.1 (95.7)
G4	1 (11.1)	8 (88.9)	1 (3.8)	24 (92.3)	0 (0.0)	113 (99.1)	2 (2.8)	69 (95.8)	2 (2.6)	73 (94.8)	3 (5.4)	56 (100.0)	2 (3.3)	57 (93.4)	1.5 (3.8)	38.5 (99.5)
G5	0 (0.0)	8 (88.9)	2 (7.7)	26 (100.0)	0 (0.0)	113 (99.1)	2 (2.8)	71 (98.6)	1 (1.3)	74 (96.1)	0 (0.0)	56 (100.0)	1 (1.6)	58 (95.1)	0.7 (1.9)	39.3 (101.4)
G6	0 (0.0)	8 (88.9)	0 (0.0)	26 (100)	0 (0.0)	113 (99.1)	1 (1.4)	72 (100)	1 (1.3)	75 (97.4)	0 (0.0)	56 (100.0)	1 (1.6)	59 (96.7)	0.3 (0.7)	39.5 (102.1)
G7	0 (0.0)	8 (88.9)	0 (0.0)	26 (100)	1 (0.9)	114 (100)	0 (0.0)	72 (100)	1 (1.3)	76 (98.7)	0 (0.0)	56 (100)	1 (1.6)	60 (98.4)	0.3 (0.7)	39.8 (102.8)
G8	1 (11.1)	9 (100)	0 (0.0)	26 (100)	0 (0.0)	114 (100)	0 (0.0)	72 (100)	0 (0.0)	76 (98.7)	0 (0.0)	56 (100.0)	0 (0.0)	60 (98.4)	0.1 (0.2)	39.9 (102.9)
G9	0 (0.0)	9 (100)	0 (0.0)	26 (100)	0 (0.0)	114 (100)	0 (0.0)	72 (100)	1 (1.3)	77 (100)	0 (0.0)	56 (100)	1 (1.6)	61 (100)	0.3 (0.7)	(100)
TOTAL	9 (100)		26 (100)		114 (100)		72 (100)		77 (100)		56 (100)		61 (100)		38.7	

F. DISTRIBUTION OF NUMBER OF EXITING FIRMS BY SIZE CLASSES AND OVER TIME

SIZE DISTRIBUTION OF EXITING FIRMS (1996-2003)																
	1996		1997		1998		1999		2000		2001		2002		2003	
SIZE	NUMBER OF FIRMS (%)	&CUMULATIV (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)
G1	85 (78.7)	85 (78.7)	105 (82.0)	105 (82.0)	84 (87.5)	84 (87.5)	109 (83.2)	109 (83.2)	75 (75.0)	75 (75.0)	60 (69.0)	60 (69.0)	91 (81.3)	91 (81.3)	40 (80.0)	40 (80.0)
G2	12 (11.1)	97 (89.8)	13 (10.2)	118 (92.2)	8 (8.3)	92 (95.8)	10 (7.6)	119 (90.8)	14 (14.0)	89 (89.0)	18 (20.7)	78 (89.7)	10 (8.9)	101 (90.2)	7 (14.0)	47 (94.0)
G3	1 (0.9)	98 (90.7)	5 (3.9)	123 (96.1)	3 (3.1)	95 (99.0)	3 (2.3)	122 (93.1)	5 (5.0)	94 (94.0)	7 (8.0)	85 (97.7)	4 (3.6)	105 (93.8)	0 (0.0)	47 (94.0)
G4	5 (4.6)	103 (95.4)	0 (0.0)	123 (96.1)	1 (1.0)	96 (100.0)	5 (3.8)	127 (96.9)	1 (1.0)	95 (95.0)	1 (1.1)	86 (98.9)	4 (3.6)	109 (97.3)	2 (4.0)	49 (98.0)
G5	2 (1.9)	105 (97.2)	2 (1.6)	125 (97.7)	0 (0.0)	96 (100.0)	3 (2.3)	130 (99.2)	3 (3.0)	98 (98.0)	0 (0.0)	86 (98.9)	1 (0.9)	110 (98.2)	0 (0.0)	49 (98.0)
G6	2 (1.9)	107 (99.1)	1 (0.8)	126 (98.4)	0 (0.0)	96 (100.0)	1 (0.8)	131 (100.0)	0 (0.0)	98 (98.0)	0 (0.0)	86 (98.9)	0 (0.0)	110 (98.2)	0 (0.0)	49 (98.0)
G7	0 (0.0)	107 (99.1)	0 (0.0)	126 (98.4)	0 (0.0)	96 (100.0)	0 (0.0)	131 (100.0)	1 (1.0)	99 (99.0)	1 (1.1)	87 (100.0)	1 (0.9)	111 (99.1)	1 (2.0)	50 (100.0)
G8	0 (0.0)	107 (99.1)	0 (0.0)	126 (98.4)	0 (0.0)	96 (100.0)	0 (0.0)	131 (100.0)	0 (0.0)	99 (99.0)	0 (0.0)	87 (100.0)	0 (0.0)	111 (99.1)	0 (0.0)	50 (100.0)
G9	1 (0.9)	108 (100.0)	2 (1.6)	128 (100.0)	0 (0.0)	96 (100.0)	0 (0.0)	131 (100.0)	1 (1.0)	100 (100.0)	0 (0.0)	87 (100.0)	1 (0.9)	112 (100.0)	0 (0.0)	50 (100.0)
TOTAL	108 (100.0)		128 (100.0)		96 (100.0)		131 (100.0)		100 (100.0)		87 (100.0)		112 (100.0)		50 (100.0)	

CONTINUED

SIZE DISTRIBUTION OF EXITING FIRMS (2004-2010)																
	2004		2005		2006		2007		2008		2009		2010		AVERAGE (1996-2010)	
SIZE	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)	NUMBER OF FIRMS (%)	CUMULATIVE (%)
G1	75 (78.9)	75 (78.9)	41 (55.4)	41 (55.4)	143 (66.8)	143 (66.8)	58 (49.2)	58 (49.2)	240 (71.2)	240 (71.2)	765 (79.3)	765 (79.3)	518 (59.2)	518 (59.2)	165.9 (71.3)	165.9 (71.3)
G2	12 (12.6)	87 (91.6)	18 (24.3)	59 (79.7)	37 (17.3)	180 (84.1)	23 (19.5)	81 (68.6)	43 (12.8)	283 (84.0)	106 (11.0)	871 (90.3)	113 (12.9)	631 (72.1)	29.6 (12.7)	195.5 (84.0)
G3	7 (7.4)	94 (98.9)	5 (6.8)	64 (86.5)	15 (7.0)	195 (91.1)	9 (7.6)	90 (76.3)	22 (6.5)	305 (90.5)	36 (3.7)	907 (94.0)	66 (7.5)	697 (79.7)	12.5 (5.4)	208.1 (89.4)
G4	0 (0.0)	94 (98.9)	4 (5.4)	68 (91.9)	8 (3.7)	203 (94.9)	8 (6.8)	98 (83.1)	16 (4.7)	321 (95.3)	25 (2.6)	932 (96.6)	53 (6.1)	750 (85.7)	8.9 (3.8)	216.9 (93.2)
G5	1 (1.1)	95 (100.0)	2 (2.7)	70 (94.6)	3 (1.4)	206 (96.3)	6 (5.1)	104 (88.1)	9 (2.7)	330 (97.9)	12 (1.2)	944 (97.8)	43 (4.9)	793 (90.6)	5.8 (2.5)	222.7 (95.7)
G6	0 (0.0)	95 (100.0)	2 (2.7)	72 (97.3)	3 (1.4)	209 (97.7)	4 (3.4)	108 (91.5)	3 (0.9)	333 (98.8)	6 (0.6)	950 (98.4)	25 (2.9)	818 (93.5)	3.1 (1.3)	225.9 (97.1)
G7	0 (0.0)	95 (100.0)	1 (1.4)	73 (98.6)	1 (0.5)	210 (98.1)	2 (1.7)	110 (93.2)	2 (0.6)	335 (99.4)	6 (0.6)	956 (99.1)	24 (2.7)	842 (96.2)	2.7 (1.1)	228.5 (98.2)
G8	0 (0.0)	95 (100.0)	0 (0.0)	73 (98.6)	1 (0.5)	211 (98.6)	4 (3.4)	114 (96.6)	1 (0.3)	336 (99.7)	4 (0.4)	960 (99.5)	12 (1.4)	854 (97.6)	1.5 (0.6)	230.0 (98.9)
G9	0 (0.0)	95 (100.0)	1 (1.4)	74 (100.0)	3 (1.4)	214 (100.0)	4 (3.4)	118 (100.0)	1 (0.3)	337 (100.0)	5 (0.5)	965 (100.0)	21 (2.4)	875 (100.0)	2.7 (1.1)	232.7 (100.0)
TOTAL	95 (100.0)		0		0		0		0		0		0		232.7	

G. DISTRIBUTION OF AVERAGE NET EMPLOYMENT GROWT RATE ACROSS SIZE CLASS

DISTRIBUTION OF GROWTH RATES BY BASE YEAR SIZE					
GROUPS	OBSERVATIONS	MEAN	STD. DEV	MIN	MAX
G1	7665	-0.2095	0.7861	-2.944	5.389
G2	2575	-0.1724	0.591	-3.6109	2.8074
G3	1207	-0.1746	0.5547	-3.068	3.544
G4	1045	-0.1489	0.5791	-4.2766	1.7486
G5	680	-0.1472	0.5724	-3.7216	2.1202
G6	446	-0.16	0.5017	-3.2581	1.2707
G7	462	-0.1706	0.5190	-3.0365	1.0679
G8	282	-0.1497	0.45	-3.5527	1
G9	747	-0.0901	0.3692	-2.2112	2.4595
DISTRIBUTION OF GROWTH RATES BY AVERAGE SIZE					
G1	8039	-0.3028	0.7503	-3.6109	3.3322
G2	2419	-0.0709	0.5996	-4.2766	3.7377
G3	1149	-0.0564	0.5722	-2.9126	4.5539
G4	1008	-0.0579	0.5973	-3.7216	2.7245
G5	632	-0.0333	0.6419	-3.0365	5.389
G6	428	-0.0254	0.5337	-3.5527	3.6343
G7	454	-0.0073	0.4444	-2.3438	2.8074
G8	260	-0.0258	0.3475	-1.4156	1.4838
G9	720	-0.0071	0.3888	-2.2112	4.1134
TOTAL	15109	-0.1837	0.6801	-4.2767	5.3891

H. DISTRIBUTION OF AVERAGE NET EMPLOYMENT GROWTH RATE BY AGE CLASSES

AGE GROUP	OBSERVATIONS	MEAN GROWTH RATE	STD. DEV.	MIN	MAX
G1	4865	-0.217	0.8121	-3.7217	4.5539
G2	2556	-0.2129	0.6787	-4.2767	4.5109
G3	1728	-0.2249	0.64337	-2.8214	3.6343
G4	1010	-0.2174	0.6719	-2.6741	5.3891
G5	1528	-0.1439	0.5726	-2.8904	2.8074
G6	2568	-0.1138	0.52	-3.068	3.5448
G7	854	-0.0666	0.484	-3.0445	2.9444
TOTAL	15109	-0.1838	0.6801	-4.2767	5.3891

I. SUMMARY OF REGRESSION RESULTS FOR TWO DIGIT INDUSTRIAL GROUPS

SUMMARY OF THE REGRESSION RESULTS FOR TWO DIGIT ISIC INDUSTRIAL GROUPS			
TWO DIGIT ISIC INDUSTRIAL GROUPS	Relationship between size and net employment growth	Relationship between age and net employment growth	Number of pooled observations
Manufacture of food products and beverages (15)	Negative*	Negative*	4065
Manufacture of textiles (17)	Insignificant	Insignificant	510
Manufacture of wearing apparel; dressing and dyeing of fur (18)	Negative*	Negative**	419
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear (19)	Insignificant	Insignificant	896
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials (200	Negative**	Insignificant	371
Manufacture of paper and paper products (21)	Insignificant	Insignificant	139
Publishing, printing and reproduction of recorded media (22)	Insignificant	Insignificant	922
Manufacture of chemicals and chemical products (24)	Insignificant	Negative**	737
Manufacture of rubber and plastics products (25)	Insignificant	Negative*	723
Manufacture of other non-metallic mineral products (26)	Negative*	Negative*	2591
Manufacture of basic metals (27)	Positive*	Negative*	178
Manufacture of fabricated metal products, except machinery and equipment (28)	Insignificant	Insignificant	973
Manufacture of machinery and equipment n.e.c. (29)	Positive*	Negative*	145
Manufacture of motor vehicles, trailers and semi-trailers (34)	Insignificant	Insignificant	170
Manufacture of furniture; manufacturing n.e.c. (36)	Negative*	Negative*	2235

J. SUMMARY OF REGRESSION RESULTS FOR FOUR DIGIT INDUSTRIAL GROUPS

SUMMARY OF THE REGRESSION RESULTS FOR FOUR DIGIT ISIC INDUSTRIAL GROUPS			
FOUR DIGIT ISIC INDUSTRIAL GROUPS	Relationship between base year size and net employment growth	Relationship between base year age and net employment growth	Number of Pooled observations
Production, processing and preserving of meat and meat products (1511)	Insignificant	Insignificant	108
Manufacture of vegetable and animal oils and fats (1514)	Insignificant	Insignificant	406
Manufacture of dairy products (1520)	Insignificant	Insignificant	46
Manufacture of grain mill products (1531)	Insignificant	Negative *	1126
Manufacture of grain mill products (1533)	Insignificant	Insignificant	45
Manufacture of bakery products (1541)	Negative*	Insignificant	1519
Manufacture of sugar (1542)	Negative*	Negative*	158
Manufacture of macaroni, noodles, couscous and similar farinaceous products (1544)	Insignificant	Positive**	79
Manufacture of other food products n.e.c. (1549)	Positive*	Insignificant	158
Distilling, rectifying and blending of spirits; ethyl alcohol production from fermented materials (1551)	Insignificant	Insignificant	134
Manufacture of malt liquors and malt (1553)	Positive*	Insignificant	97
Manufacture of soft drinks; production of mineral waters (1554)	Insignificant	Insignificant	175
Spinning, weaving and finishing of textiles (1710)	Negative**	Insignificant	373
Manufacture of knitted and crocheted fabrics and articles (1730)	Insignificant	Positive*	98

Manufacture of wearing apparel, except fur apparel (1810)	Negative*	Negative**	419
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness (1910)	Negative*	Positive*	215
Manufacture of footwear (1920)	Insignificant	Insignificant	681
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials (2000)	Negative**	Insignificant	371
Manufacture of paper and paper products (2100)	Insignificant	Insignificant	139
Publishing, printing and reproduction of recorded media (2200)	Insignificant	Insignificant	922
Manufacture of basic chemicals, except fertilizers and nitrogen compounds (2411)	Negative**	Insignificant	98
Manufacture of paints, varnishes and similar coatings, printing ink and mastics (2422)	Insignificant	Insignificant	118
Manufacture of pharmaceuticals, medicinal chemicals and botanical products (2423)	Insignificant	Insignificant	66
Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations (2424)	Insignificant	Negative*	369
Manufacture of other chemical products n.e.c. (2429)	Negative**	Insignificant	80
Manufacture of rubber products (2510)	Insignificant	Negative*	67
Manufacture of plastics products (2520)	Insignificant	Negative*	656
Manufacture of structural non-refractory clay and ceramic products (2693)	Insignificant	Positive**	86
Manufacture of cement, lime and plaster (2694)	Insignificant	Negative**	134
Manufacture of articles of concrete, cement and plaster (2695)	Negative*	Negative*	1715
Manufacture of other non-metallic mineral products n.e.c. (2699)	Negative*	Negative*	629
Manufacture of basic iron and steel (2710)	Positive*	Negative*	176
Manufacture of structural metal products (2811)	Insignificant	Insignificant	649
Treatment and coating of metals; general mechanical engineering on a fee or contract basis (2892)	Insignificant	Insignificant	97
Manufacture of cutlery, hand tools and general hardware (2893)	Insignificant	Insignificant	102
Manufacture of other fabricated metal products n.e.c. (2899)	Insignificant	Insignificant	125
Manufacture of ovens, furnaces and furnace burners (2914)	Insignificant	Negative**	68
Manufacture of machinery for food, beverage and tobacco processing (2925)	Positive**	Insignificant	65
Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers (3420)	Positive*	Insignificant	106
Manufacture of parts and accessories for motor vehicles and their engines (3430)	Insignificant	Negative*	63
Manufacture of furniture (3610)	Negative*	Negative*	2234