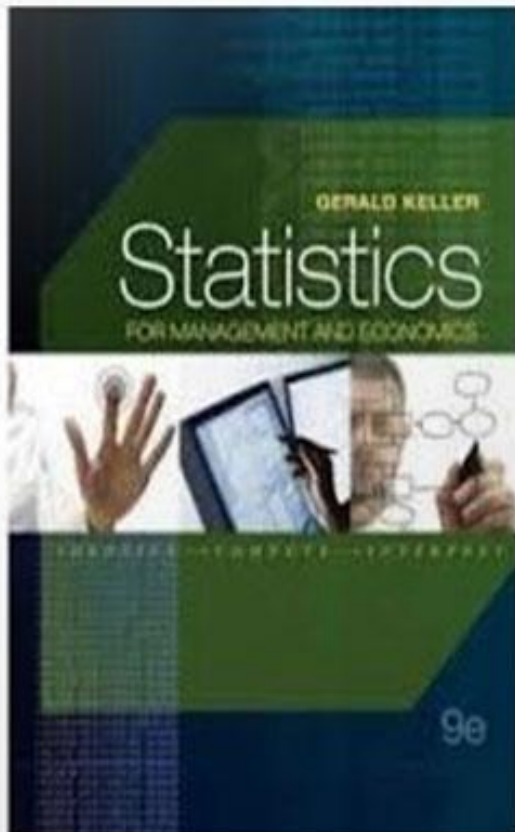


# SOLUTIONS MANUAL



## Chapter 2

2.1 Nominal: Occupation, undergraduate major. Ordinal: Rating of university professor, Taste test ratings. Interval: age, income

2.2 a Interval

b Interval

c Nominal

d Ordinal

2.3 a Interval

b Nominal

c Ordinal

d Interval

e Interval

2.4 a Nominal

b Interval

c Nominal

d Interval

e Ordinal

2.5 a Interval

b Interval

c Nominal

d Interval

e Nominal

2.6 a Interval

b Interval

c Nominal

d Ordinal

e Interval

2.7 a Interval

b Nominal

c. Nominal

d Interval

e Interval

f Ordinal

2.8 a Interval

b Ordinal

c Nominal

d Ordinal

2.9 a Interval

b Nominal

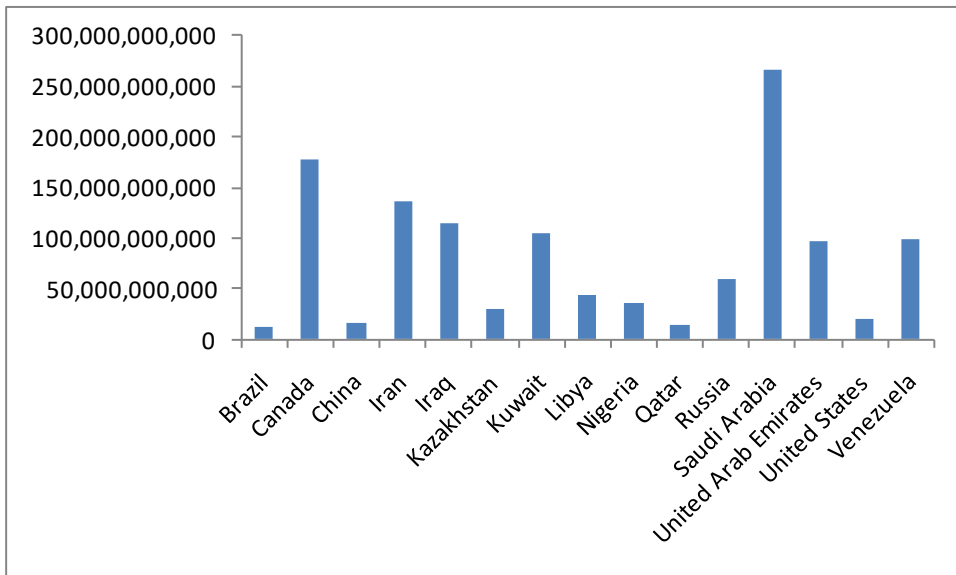
c Nominal

2.10 a Ordinal

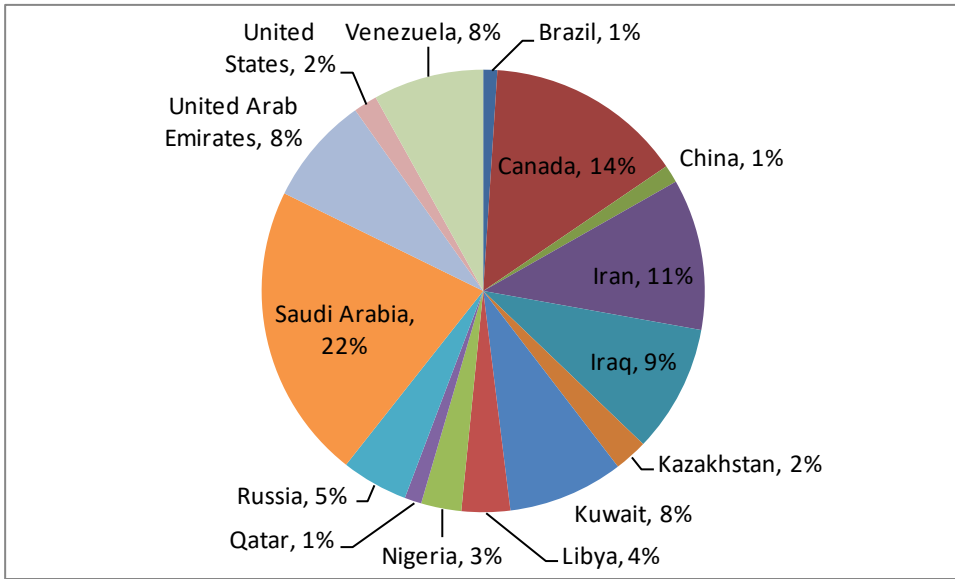
b Ordinal

c Ordinal

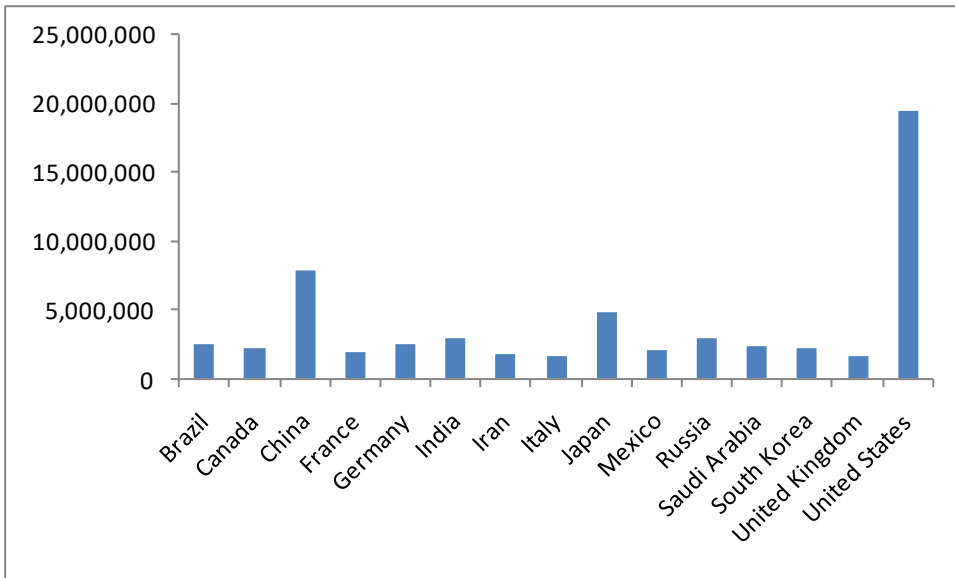
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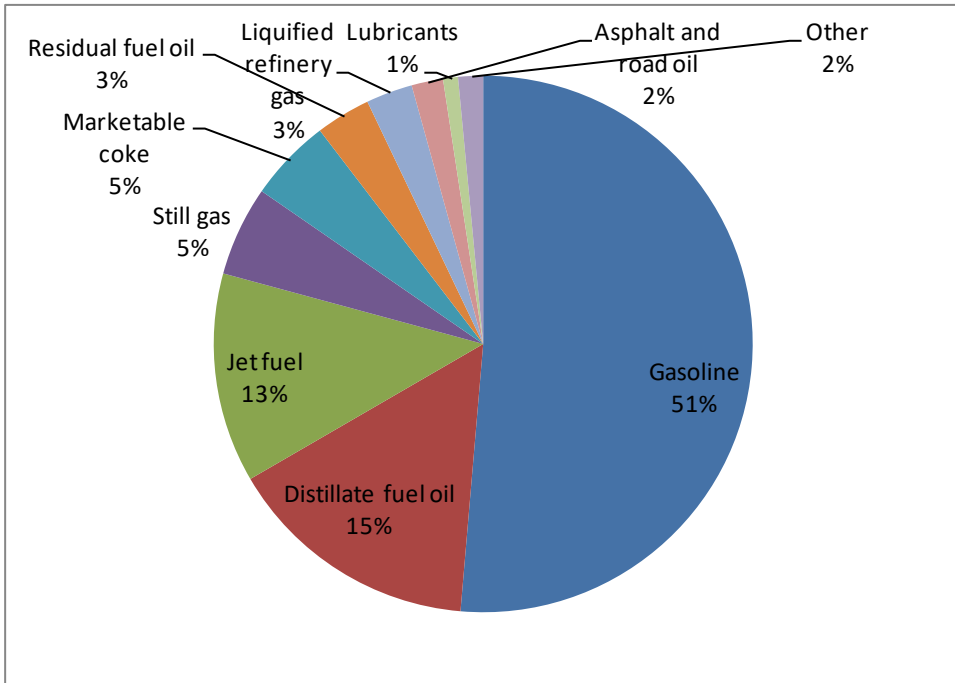
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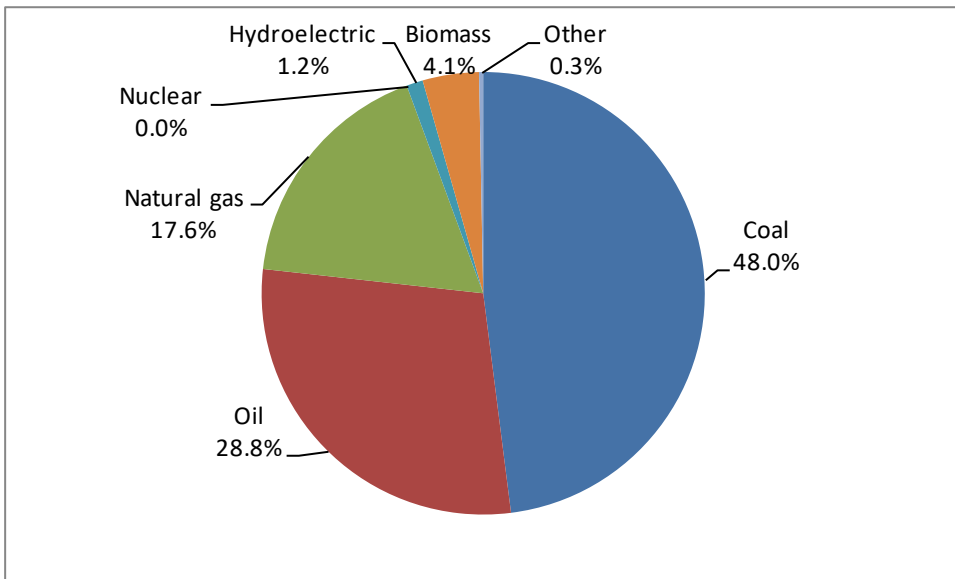
2.13



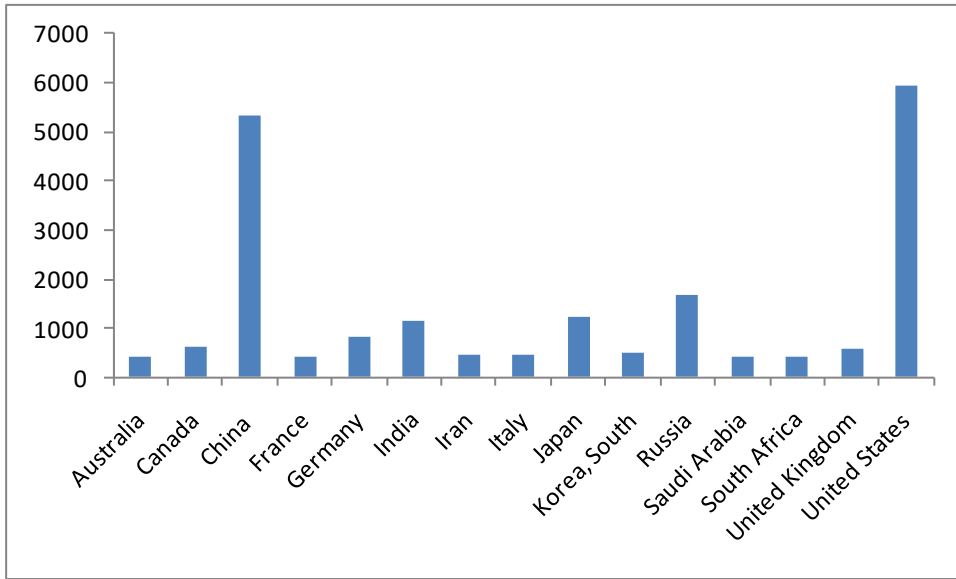
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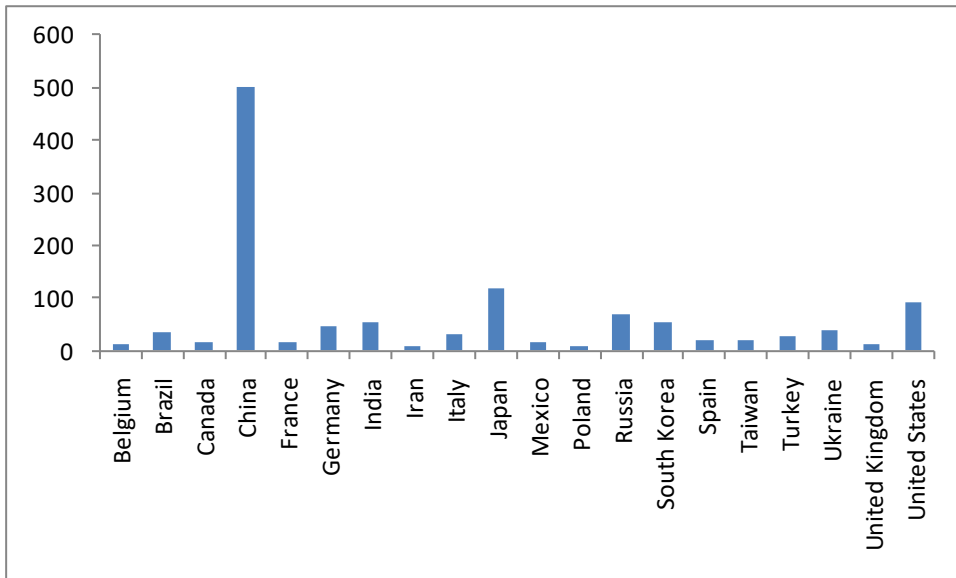
2.15



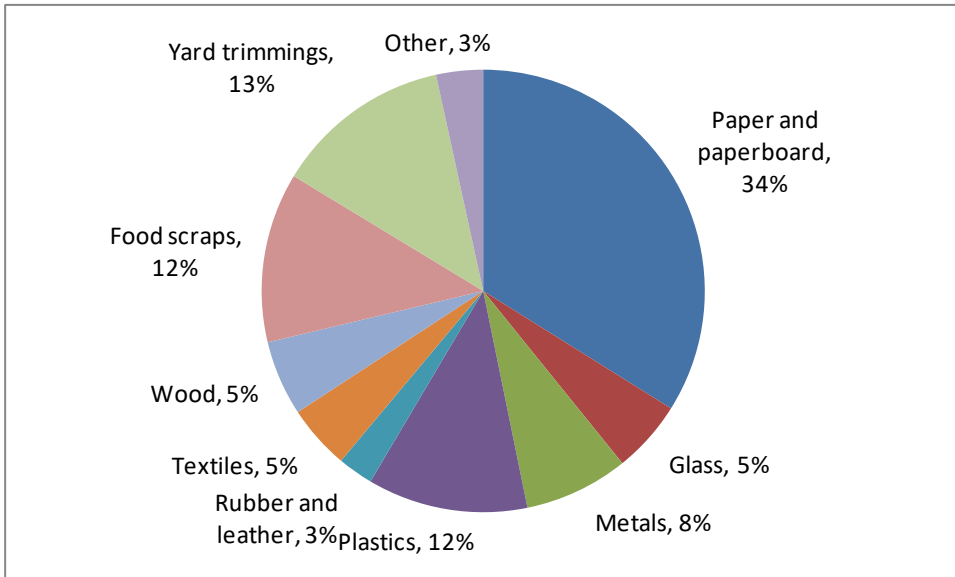
2.16



2.17

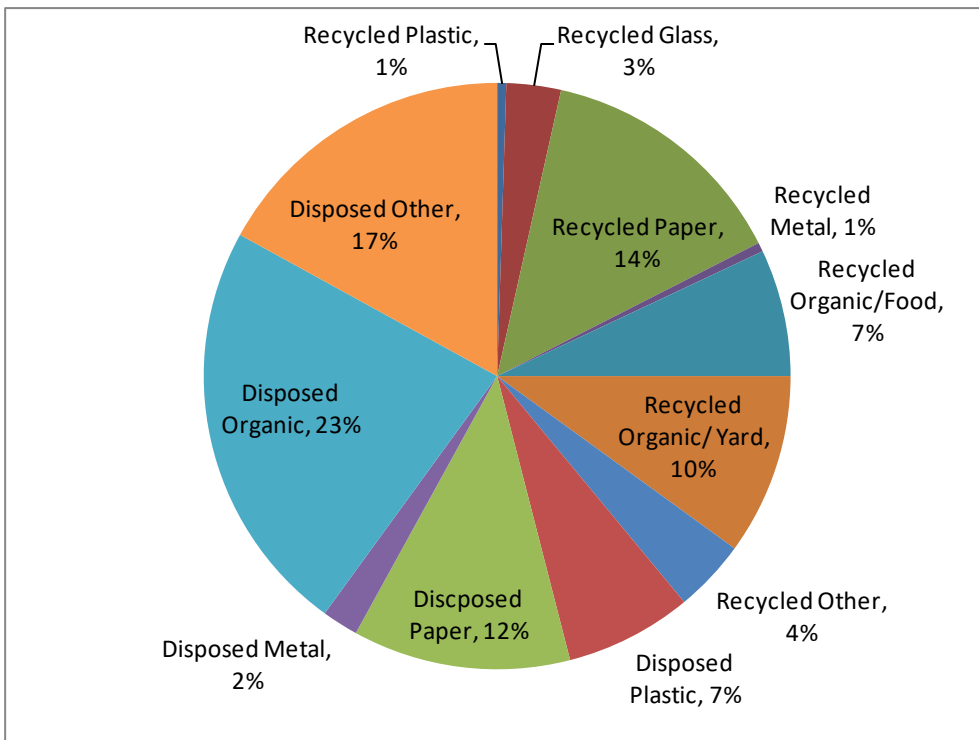


2.18

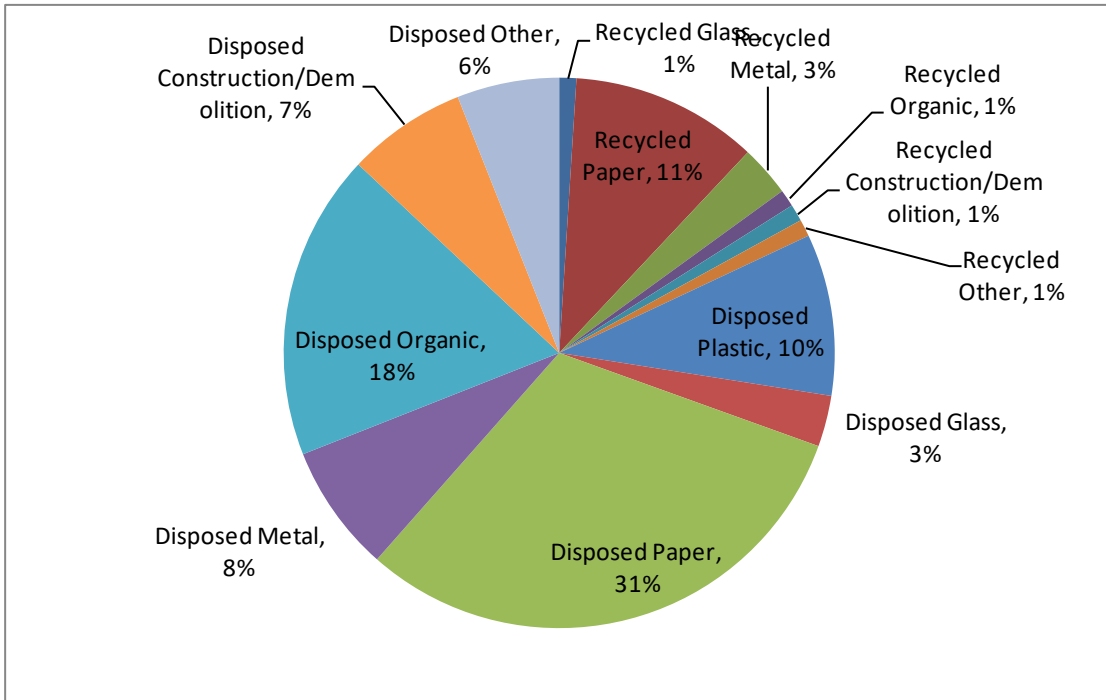


2.19

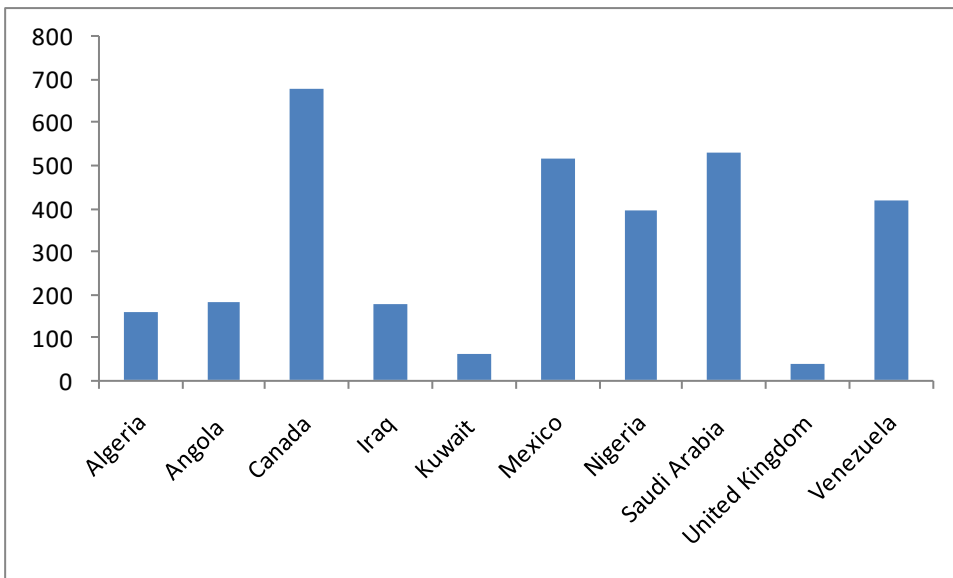
Residential



Non-Residential

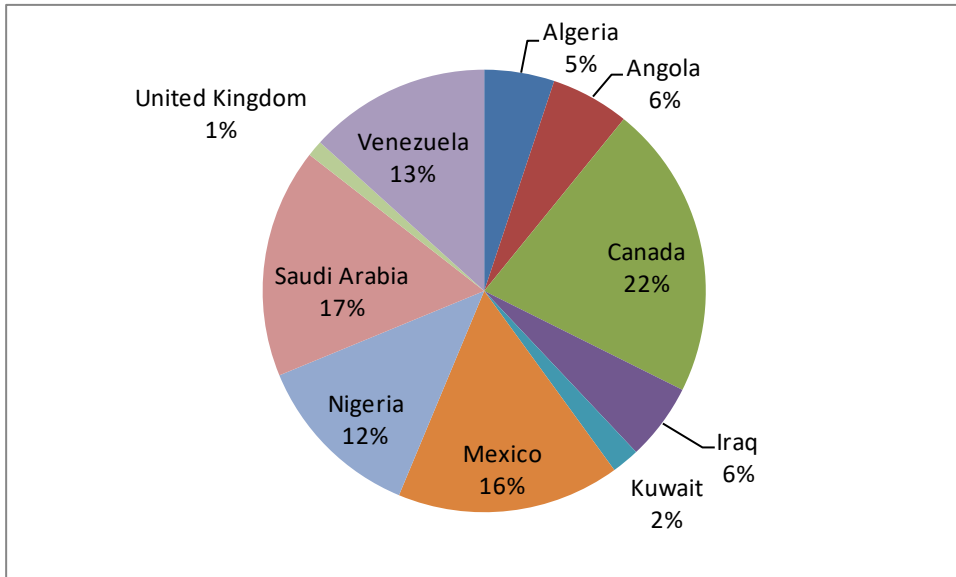


2.20 a.





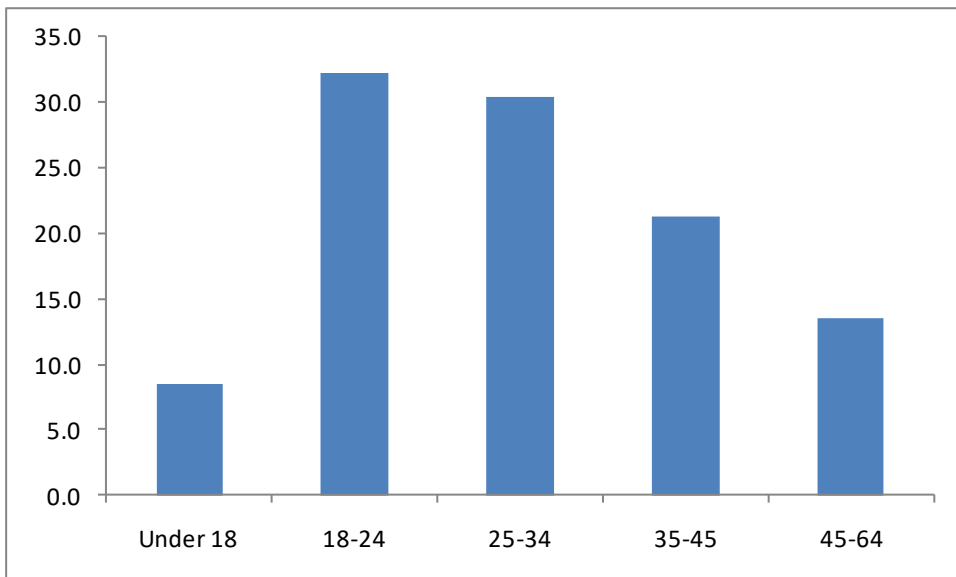
b.



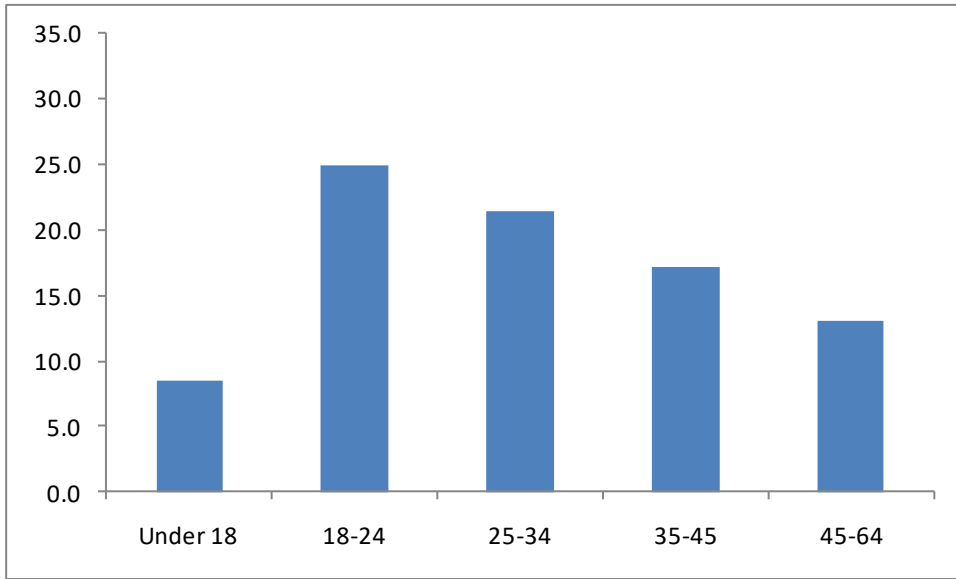
The bar chart provides the frequencies and the pie chart displays the relative frequencies.

2.21

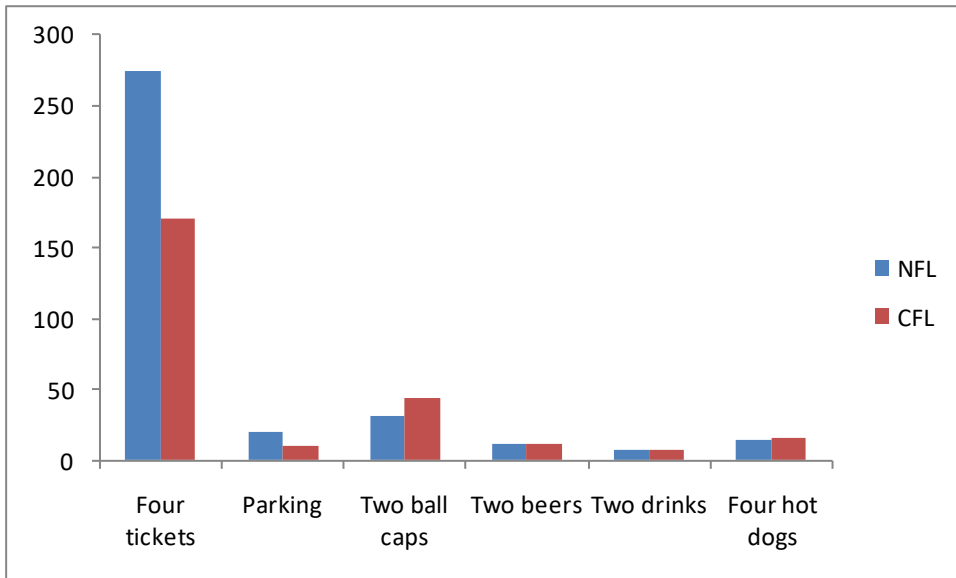
Males



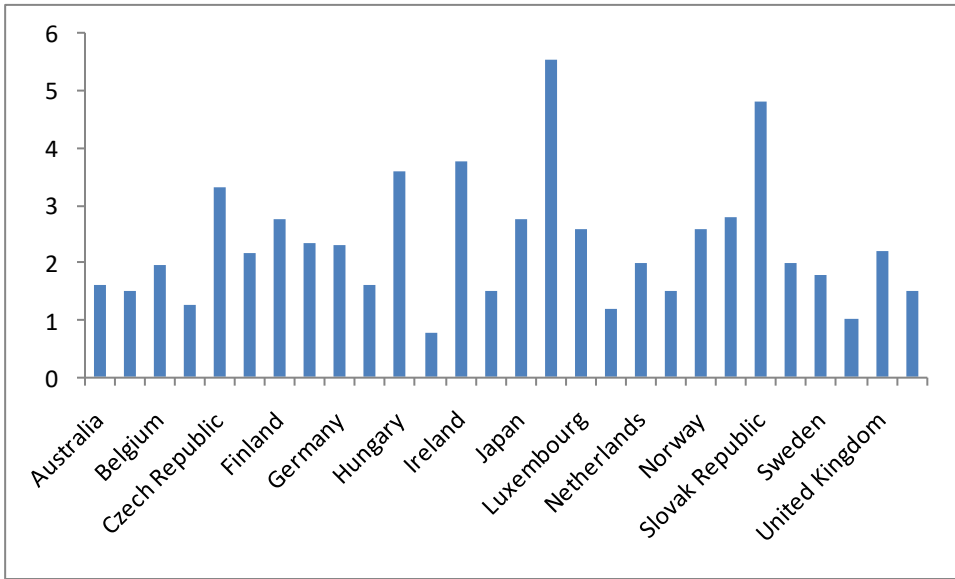
Females



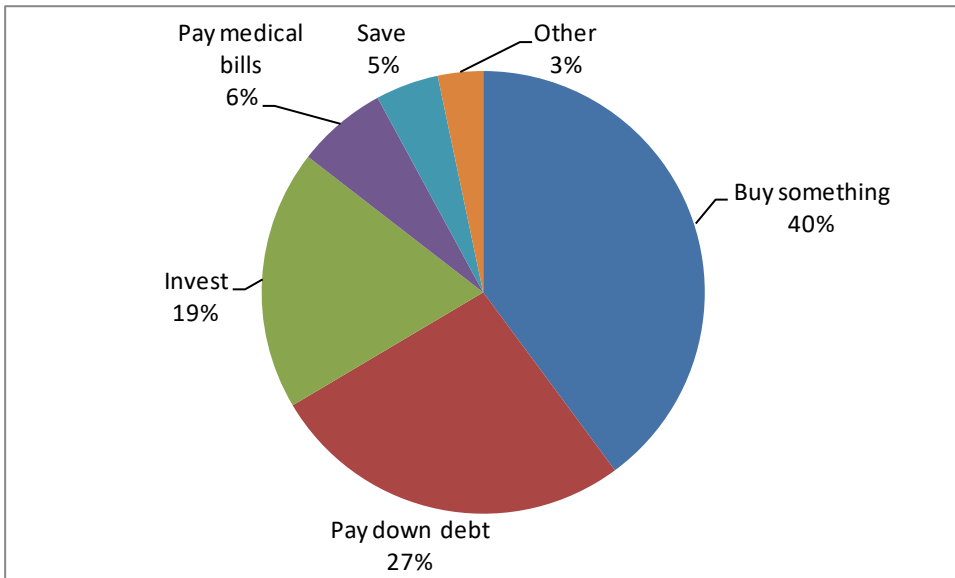
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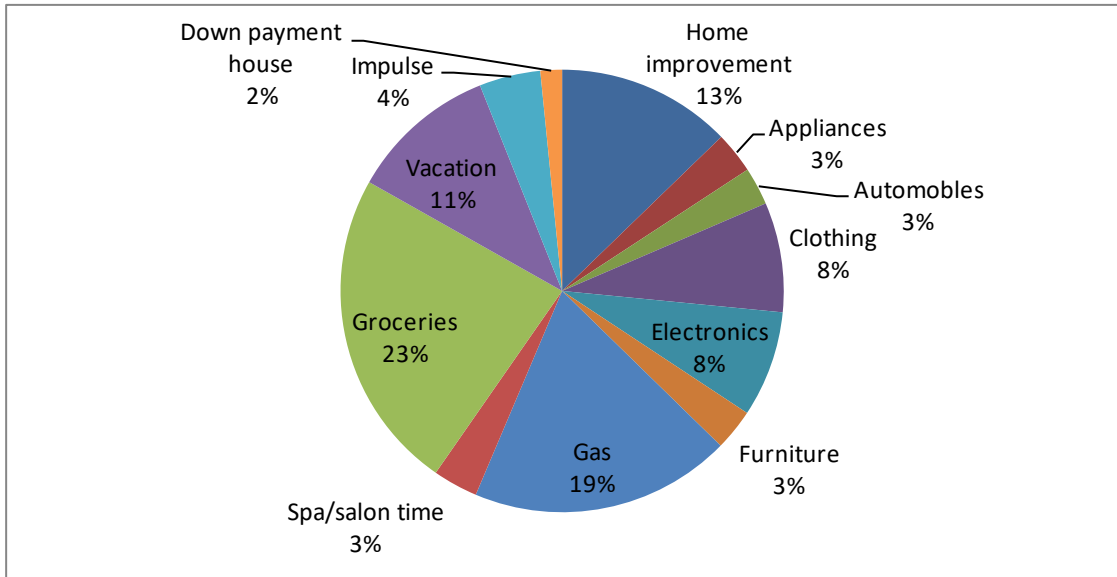
2.23



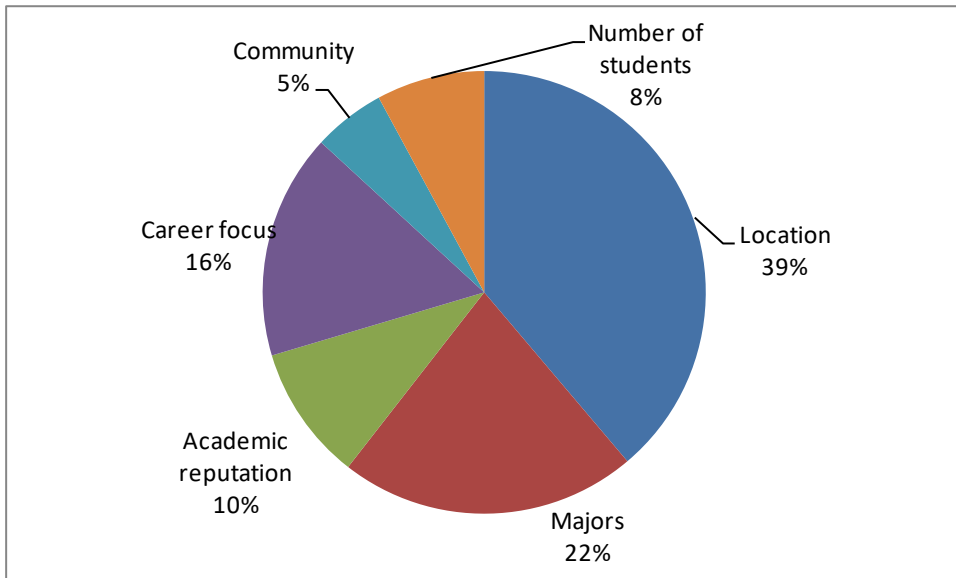
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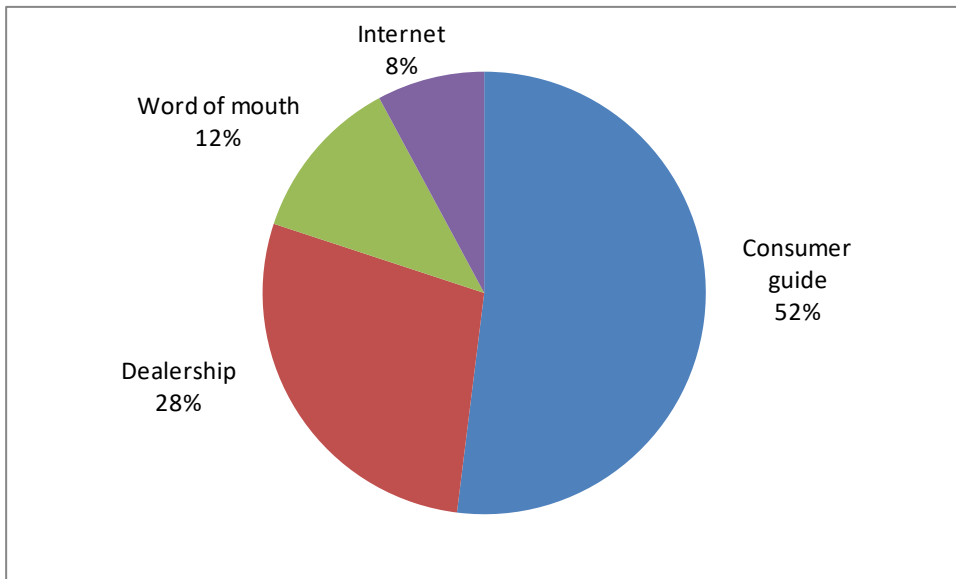
2.25



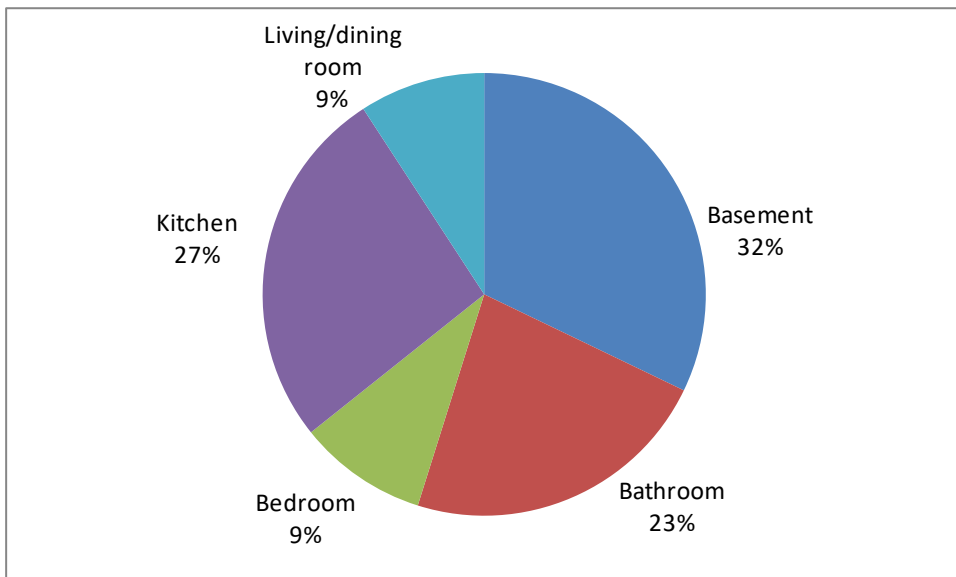
2.26



2.27



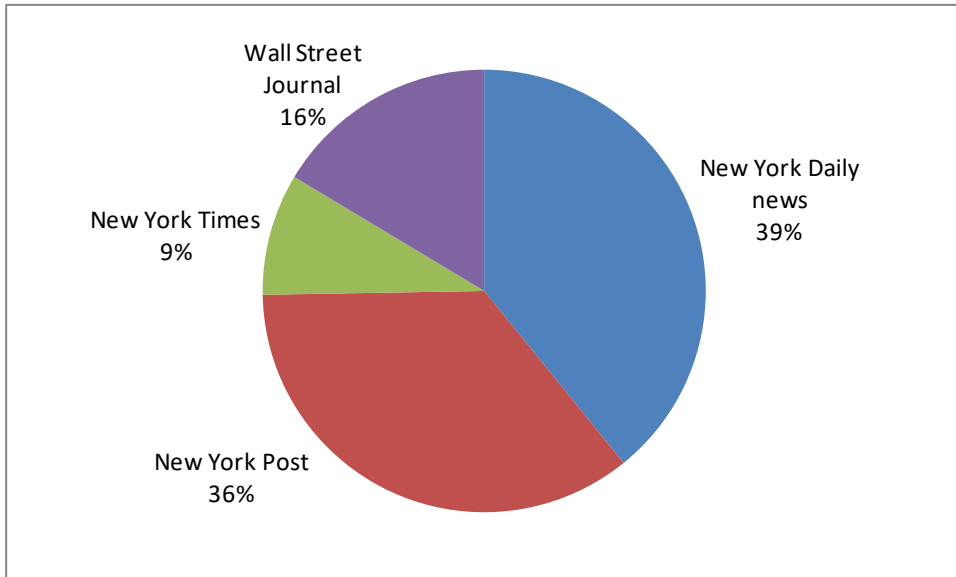
2.28



2.29 a Newspaper    Frequency    Relative Frequency

Daily News	141	.39
Post	128	.36
Times	32	.09
WSJ	59	.16

b

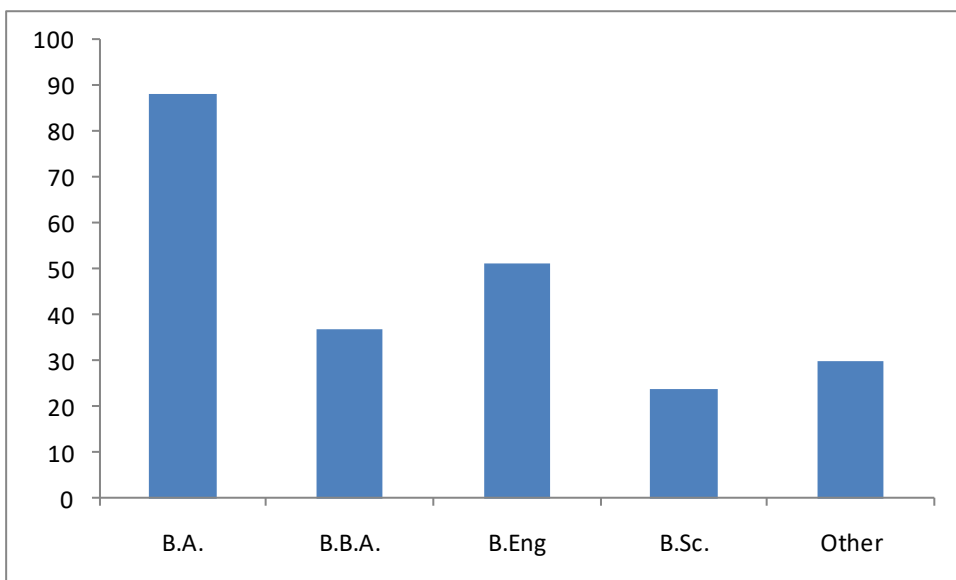


The Daily News and the Post dominate the market

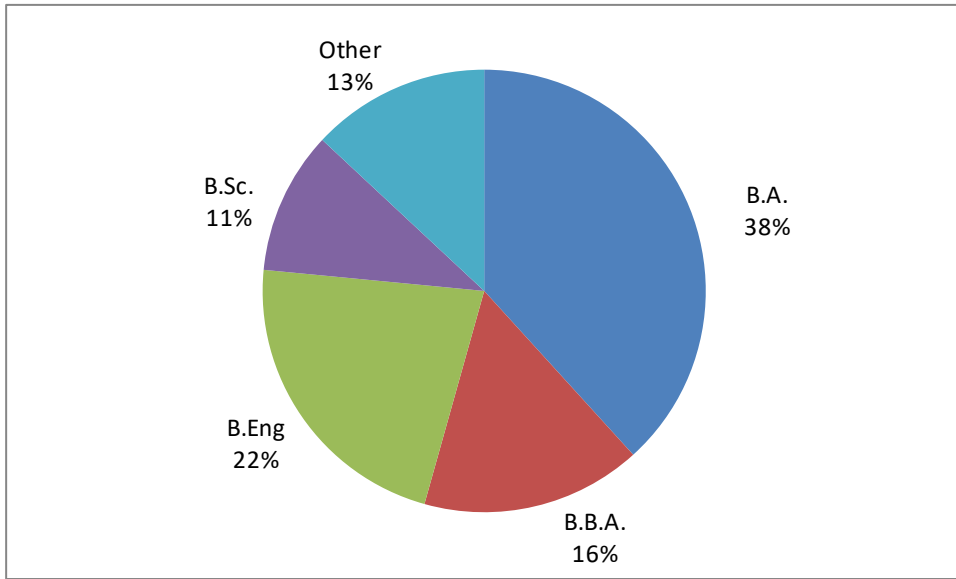
2.30a Degree      Frequency

BA	88
BBA	37
B Eng	51
B Sc	24
Other	30

b.

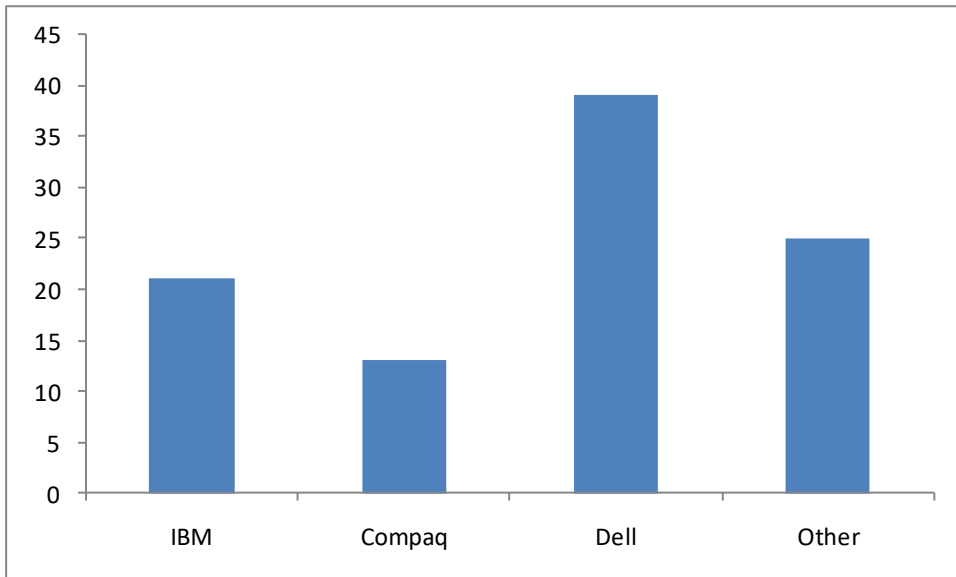


c

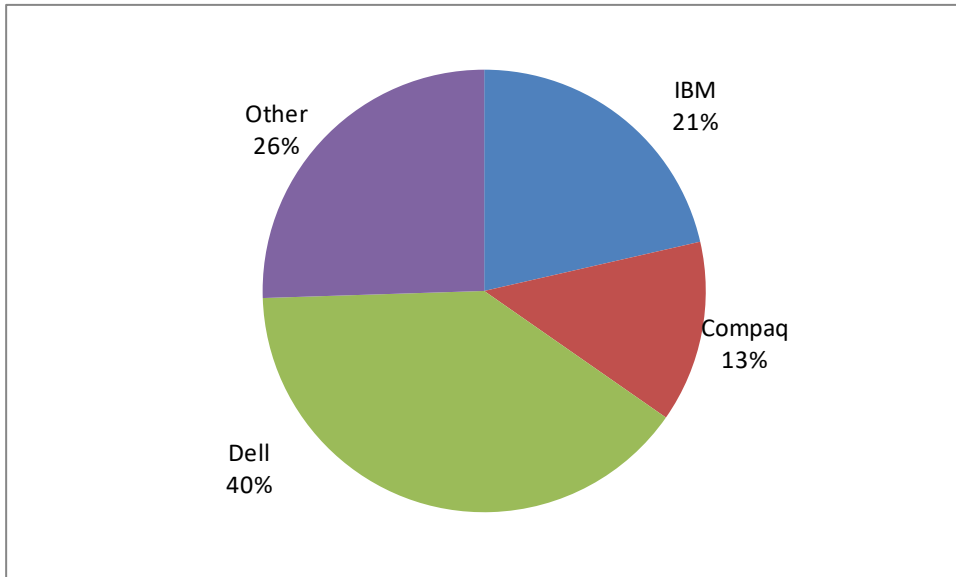


d. About 4 applicants in 10 have the BA degree, about one-fifth have a BEng. and one-sixth have a BBA.

2.31a



b



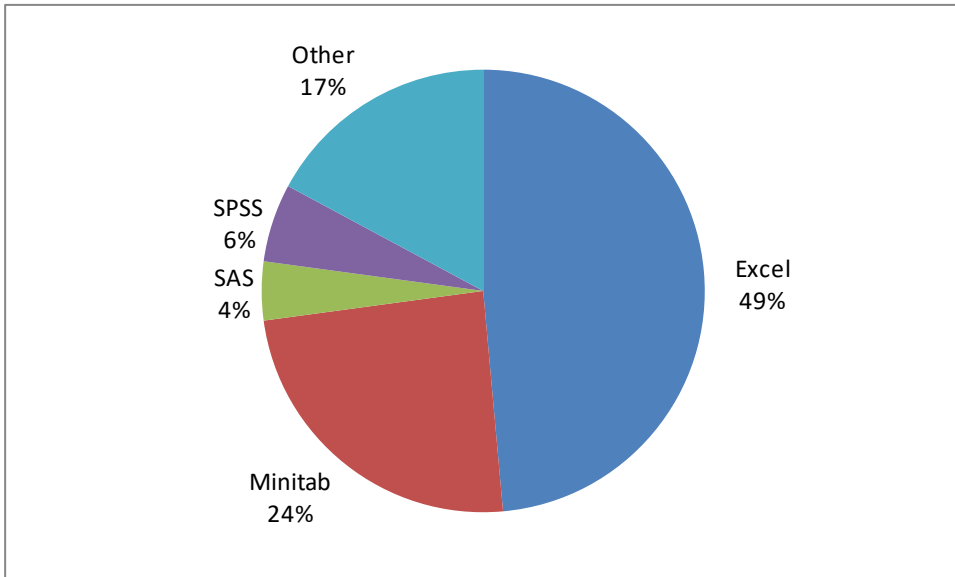
c Dell is most popular with 40% proportion, followed by other, 26%, IBM, 21% and Compaq, 13%.

2.32 a

<u>Software</u>	<u>Frequency</u>
Excel	34
Minitab	17
SAS	3
SPSS	4
Other	12

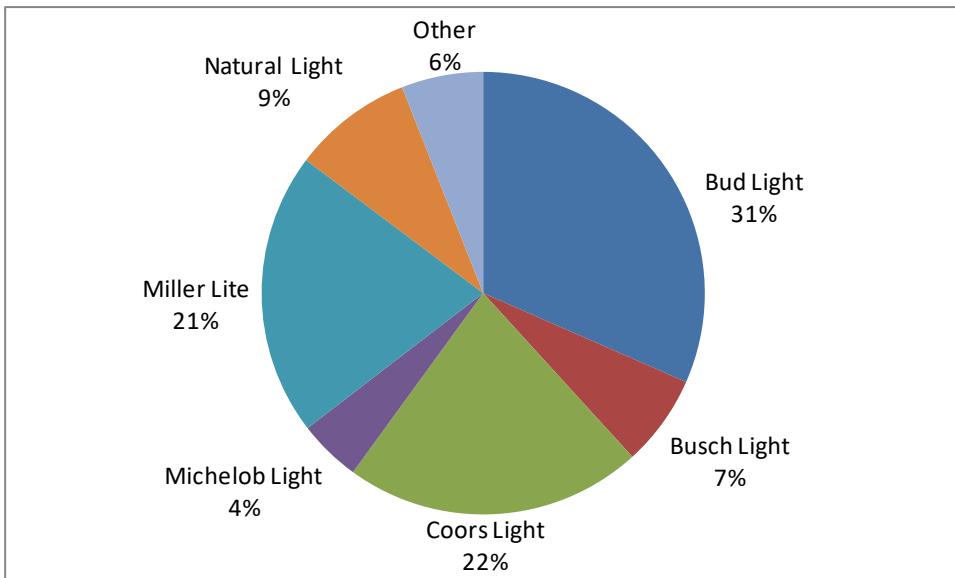


b

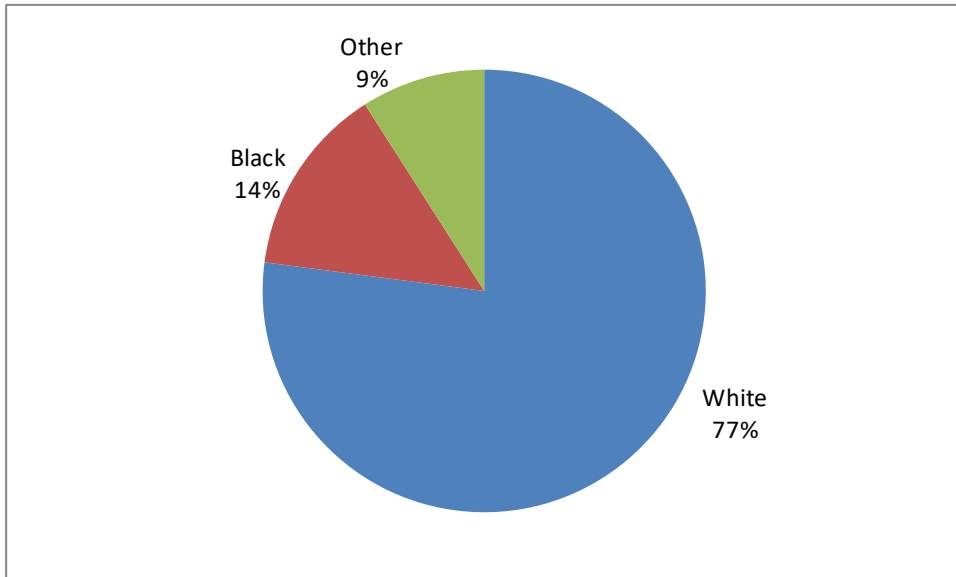


c Excel is the choice of about half the sample, one-quarter have opted for Minitab, and a small fraction chose SAS and SPSS.

2.33

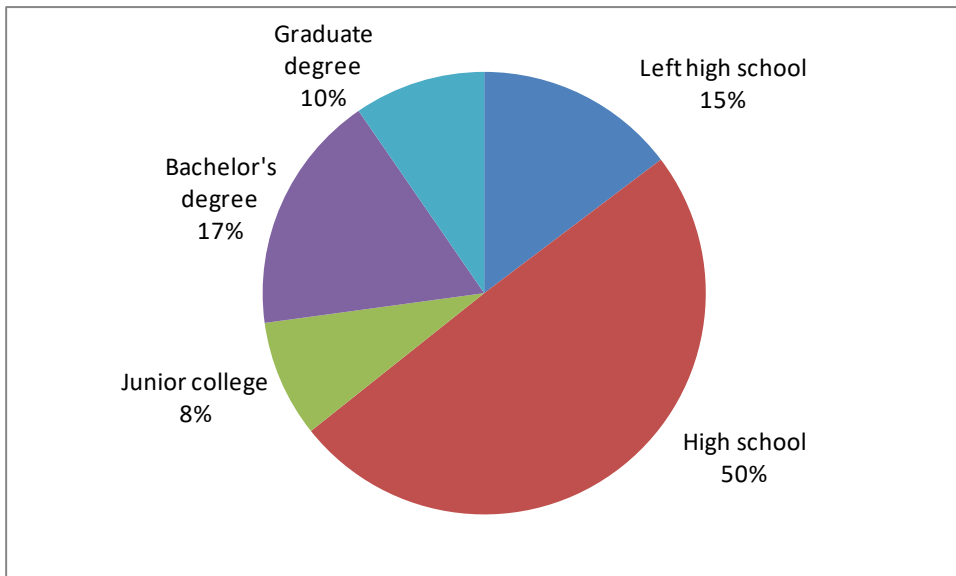


2.34



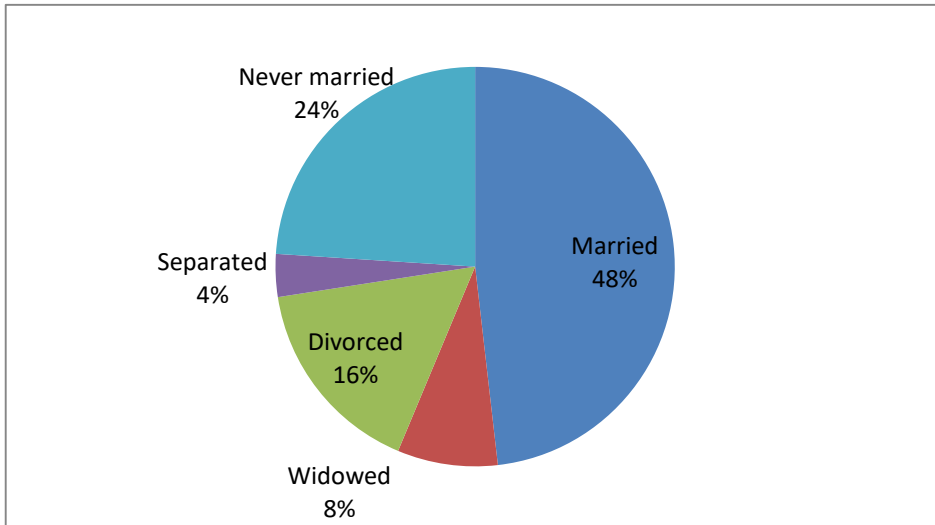
Three out of four Americans are White. Note that the survey did not separate Hispanics.

2.35



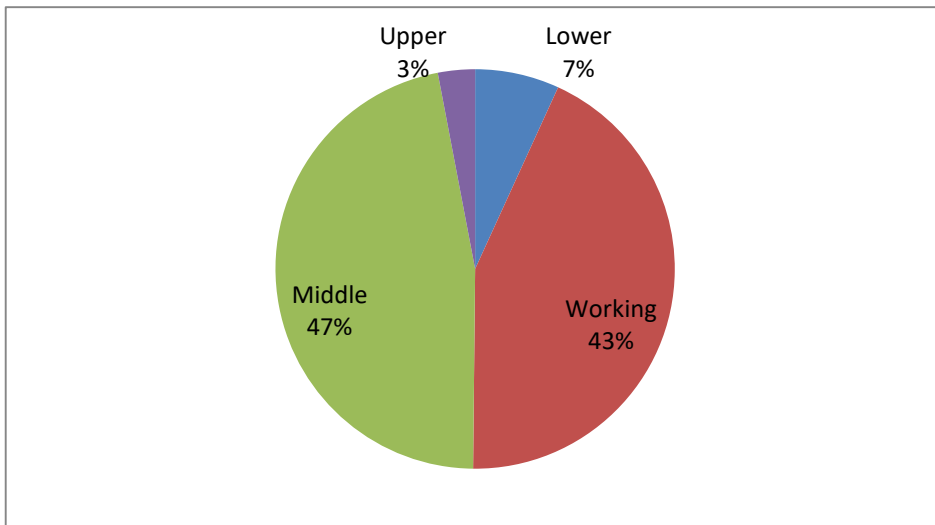
Half of American adults finished high school only. Approximately one-third received some kind of post-secondary education.

2.36



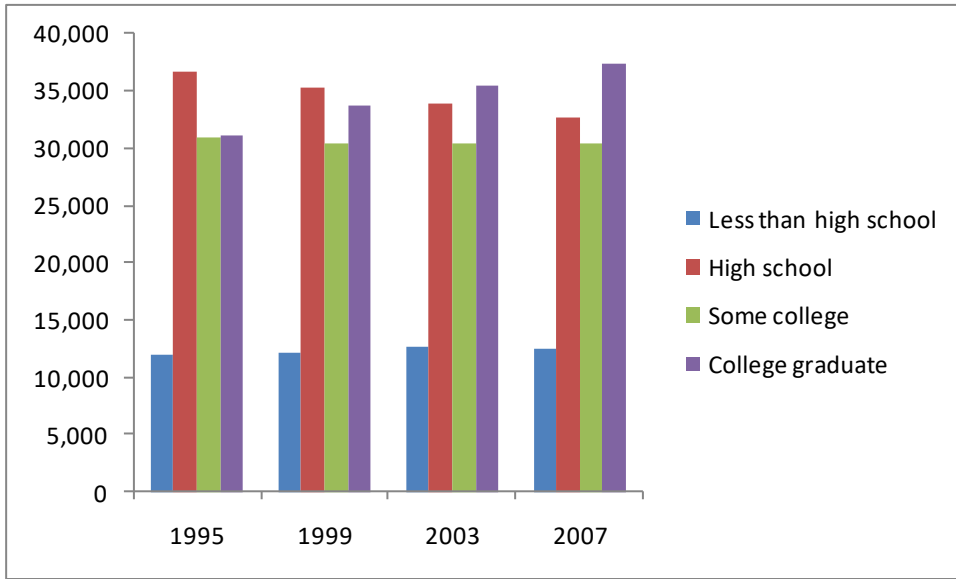
Almost half the sample is married and about one out of four were never married.

2.37



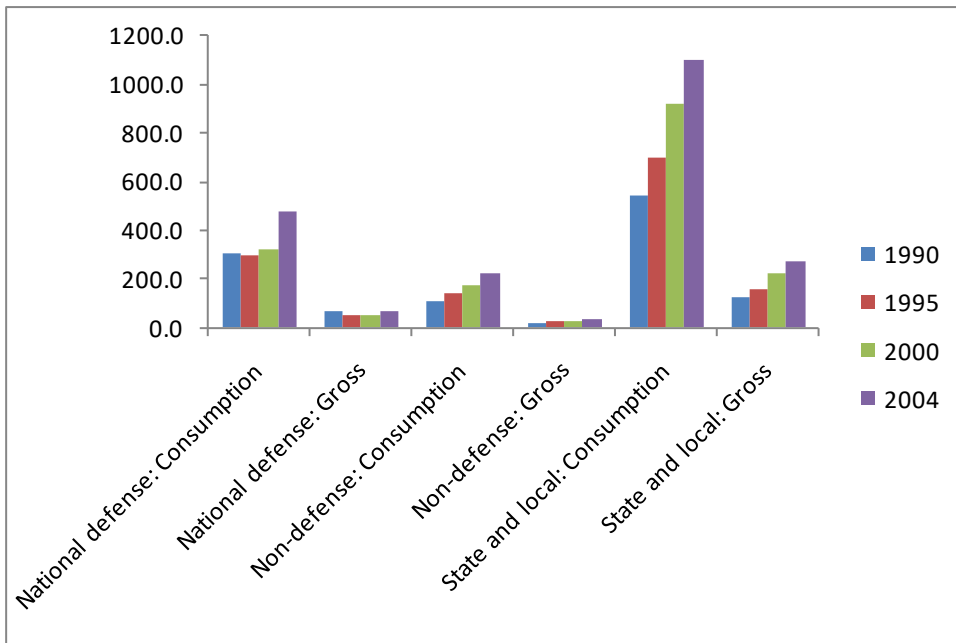
Nine of out of 10 Americans classify themselves as middle or working class.

2.38



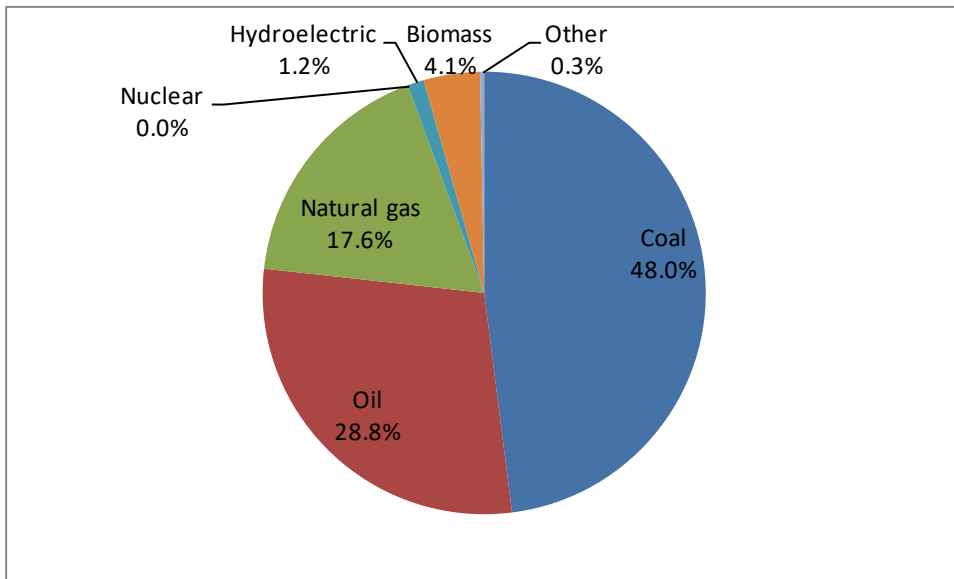
The “Less than high school” category has remained constant, while the number of college graduates has increased.

2.39

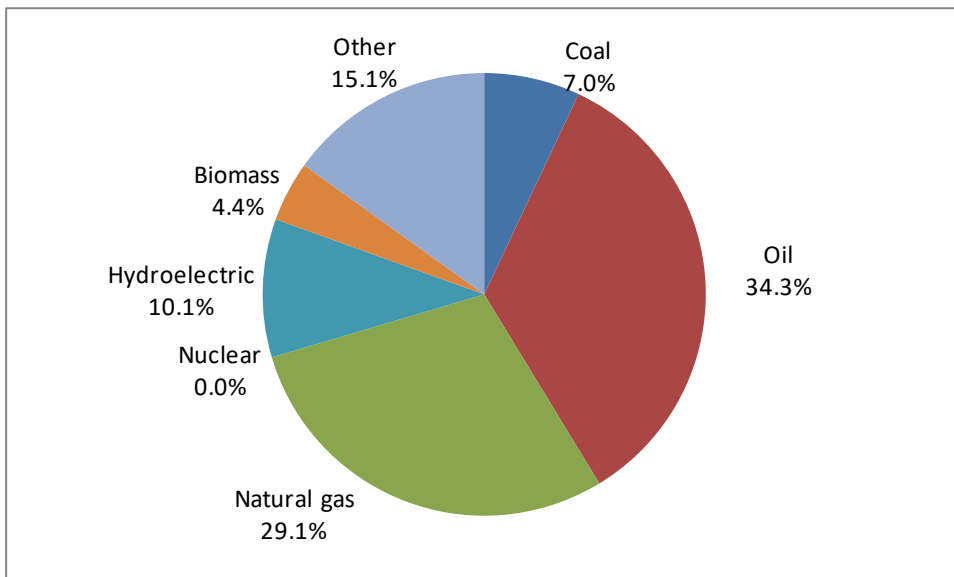


The state and local consumption has increased rapidly compared to the other categories.

### 2.40 Australian Energy Sources

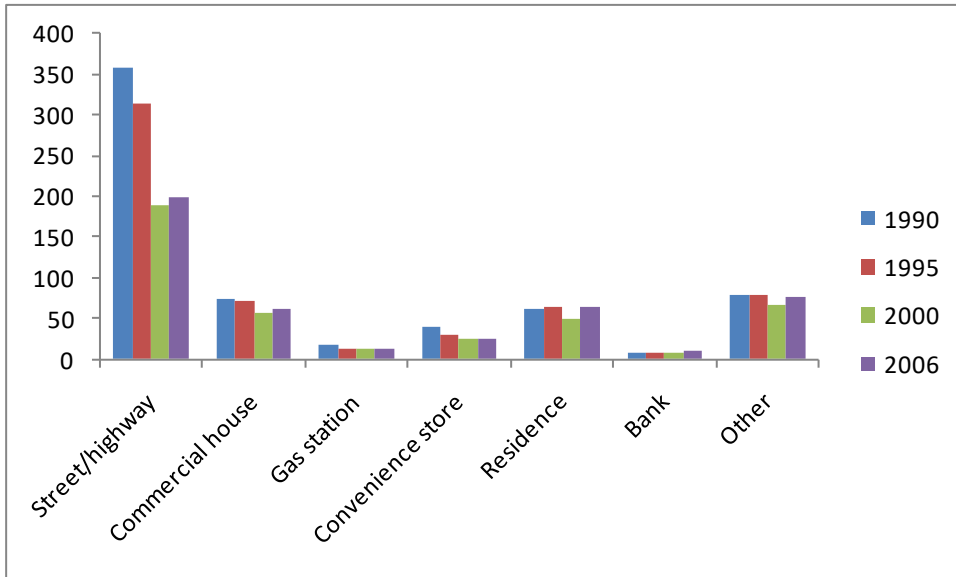


### New Zealand Energy Sources



The dominant source in Australia is coal. In New Zealand it is oil.

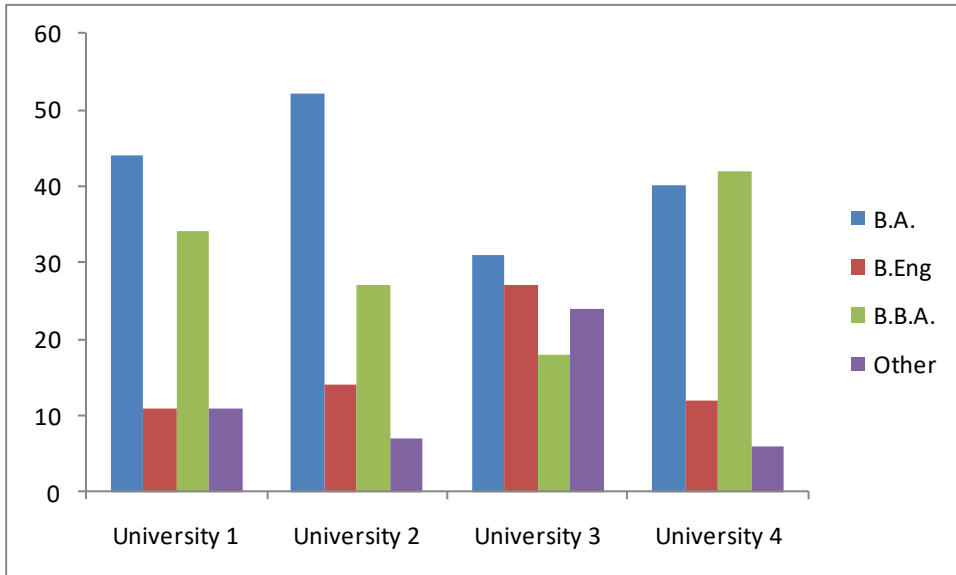
2.41



Street crime has decreased while all the other categories have remained constant.

2.42

	A	B	C	D	E	F
1	Drop Page Fields Here					
2						
3	Count of Student	Degree				
4	University	B.A.	B.Eng	B.B.A.	Other	Grand Total
5	University 1	44	11	34	11	100
6	University 2	52	14	27	7	100
7	University 3	31	27	18	24	100
8	University 4	40	12	42	6	100
9	Grand Total	167	64	121	48	400



Universities 1 and 2 are similar and quite dissimilar from universities 3 and 4, which also differ. The two nominal variables appear to be related.

2.43

3	Count of Owner	Last				
4	Second-last	Exxon	Amoco	Texaco	Other	Grand Total
5	Exxon	39	36	51	23	149
6	Amoco	36	32	46	20	134
7	Texaco	54	46	65	29	194
8	Other	24	20	28	10	82
9	Grand Total	153	134	190	82	559

3	Count of Owner	Last				
4	Second-last	Exxon	Amoco	Texaco	Other	Grand Total
5	Exxon	25%	27%	27%	28%	27%
6	Amoco	24%	24%	24%	24%	24%
7	Texaco	35%	34%	34%	35%	35%
8	Other	16%	15%	15%	12%	15%
9	Grand Total	100%	100%	100%	100%	100%

The column proportions are similar; the two nominal variables appear to be unrelated. There does not appear to be any brand loyalty.

2.44

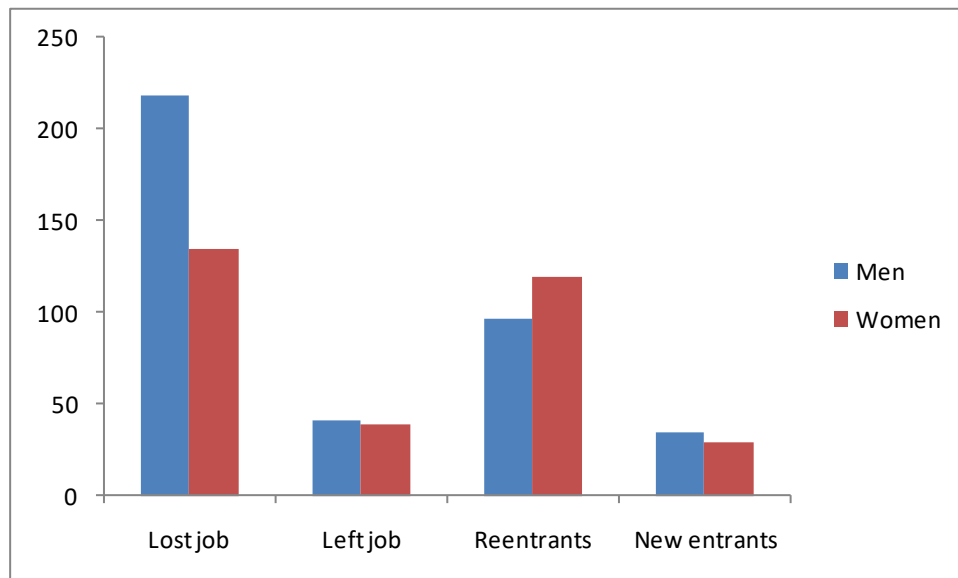
3	Count of Respondent	Smoke?		
4	Parent	Smoke?	Do not smo	Grand Total
5	Neither	73	14	87
6	Father	26	12	38
7	Mother	31	18	49
8	Both	10	41	51
9	Grand Total	140	85	225

3	Count of Respondent	Smoke?		
4	Parent	Smoke?	Do not smoke	Grand Total
5	Neither	52%	16%	39%
6	Father	19%	14%	17%
7	Mother	22%	21%	22%
8	Both	7%	48%	23%
9	Grand Total	100%	100%	100%

The two variables are related.

2.45

	A	B	C
1		Men	Women
2	Lost job	218	134
3	Left job	41	39
4	Reentrants	96	119
5	New entrants	34	29



There are large differences between men and women in terms of the reason for unemployment.

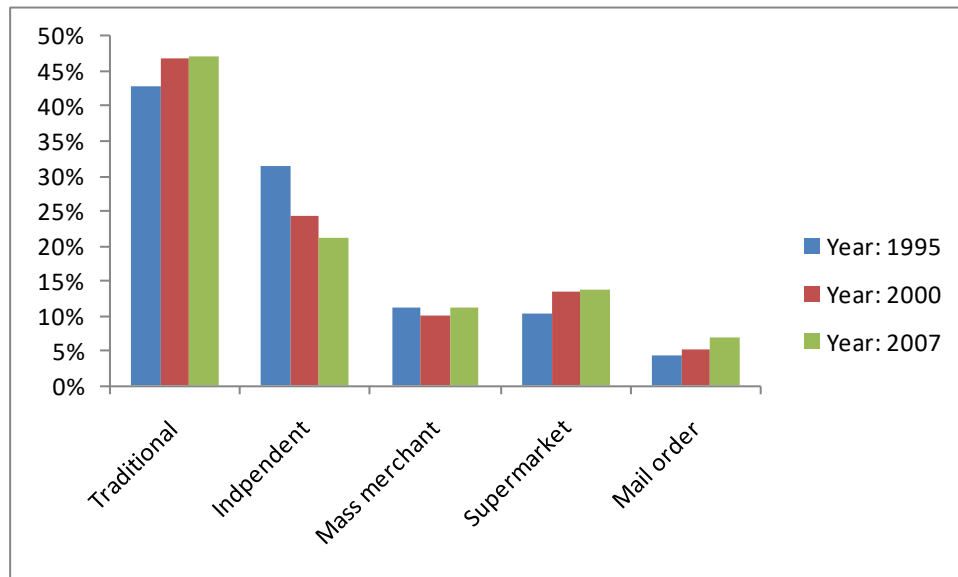


### 2.46 Counts

	A	B	C	D
1		Year: 1995	Year: 2000	Year: 2007
2	Traditional	91	134	166
3	Independent	67	70	75
4	Mass merchant	24	29	39
5	Supermarket	22	39	48
6	Mail order	9	15	24

### Column percent

	A	B	C	D
1		Year: 1995	Year: 2000	Year: 2007
2	Traditional	43%	47%	47%
3	Independent	31%	24%	21%
4	Mass merchant	11%	10%	11%
5	Supermarket	10%	14%	14%
6	Mail order	4%	5%	7%



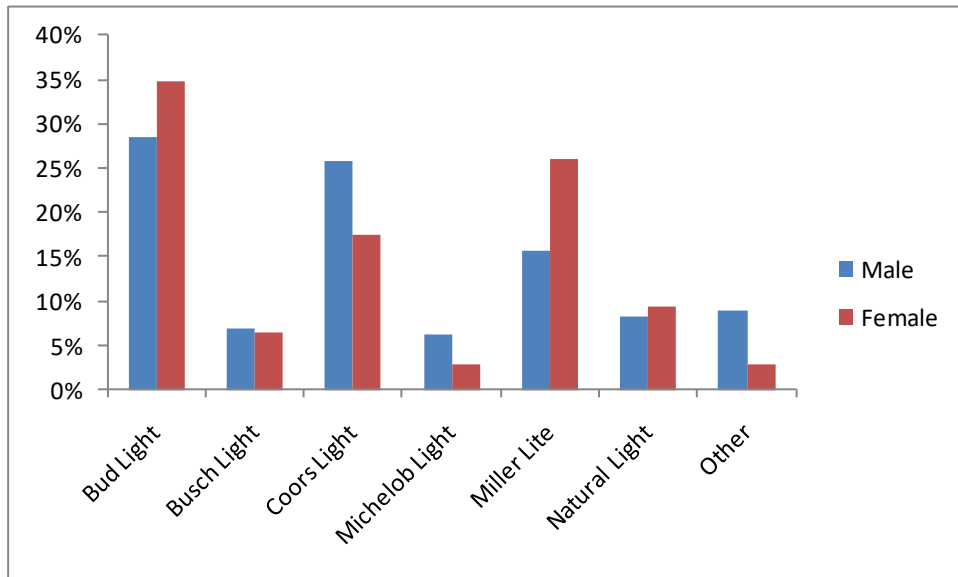
The number of prescriptions filled by independent drug stores has decreased while the others remained constant or increased slightly.

2.47 Counts

3	Count of Number	Gender		
4	Brand	Male	Female	Grand Total
5	Bud Light	42	48	90
6	Busch Light	10	9	19
7	Coors Light	38	24	62
8	Michelob Light	9	4	13
9	Miller Lite	23	36	59
10	Natural Light	12	13	25
11	Other	13	4	17
12	Grand Total	147	138	285

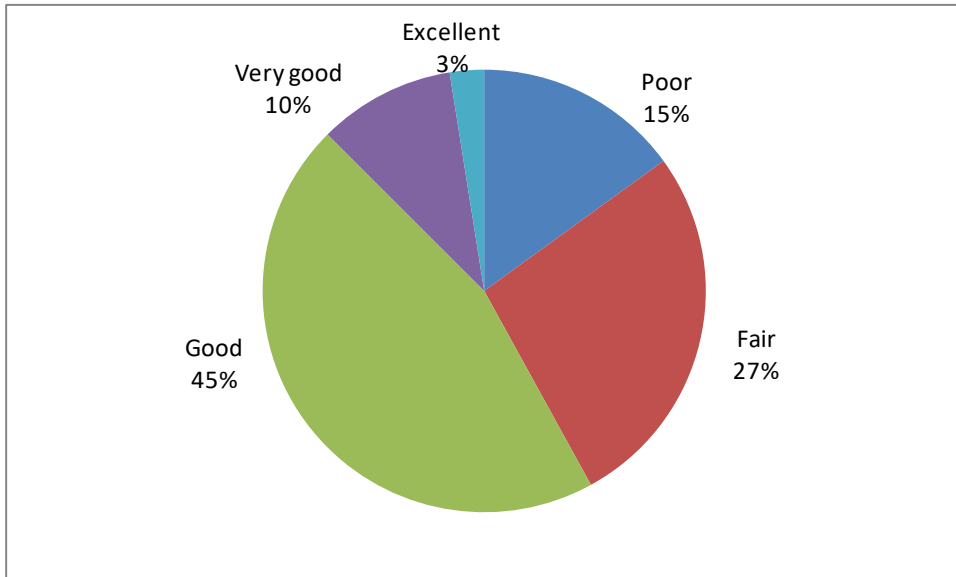
Column percent

3	Count of Number	Gender		
4	Brand	Male	Female	Grand Total
5	Bud Light	29%	35%	32%
6	Busch Light	7%	7%	7%
7	Coors Light	26%	17%	22%
8	Michelob Light	6%	3%	5%
9	Miller Lite	16%	26%	21%
10	Natural Light	8%	9%	9%
11	Other	9%	3%	6%
12	Grand Total	100%	100%	100%



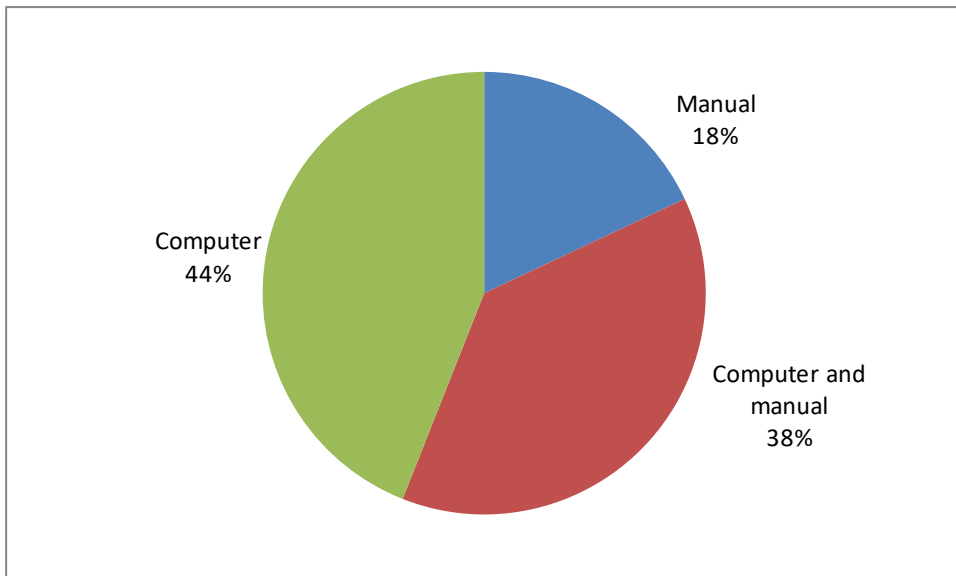
There appears to be differences between female and male students in their choice of light beer.

2.48

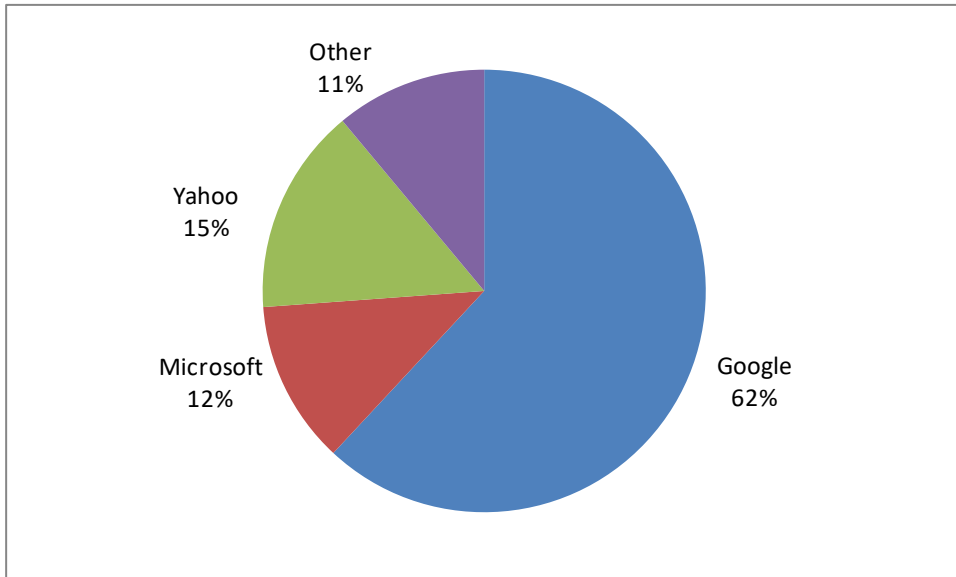


More than 40% rate the food as less than good.

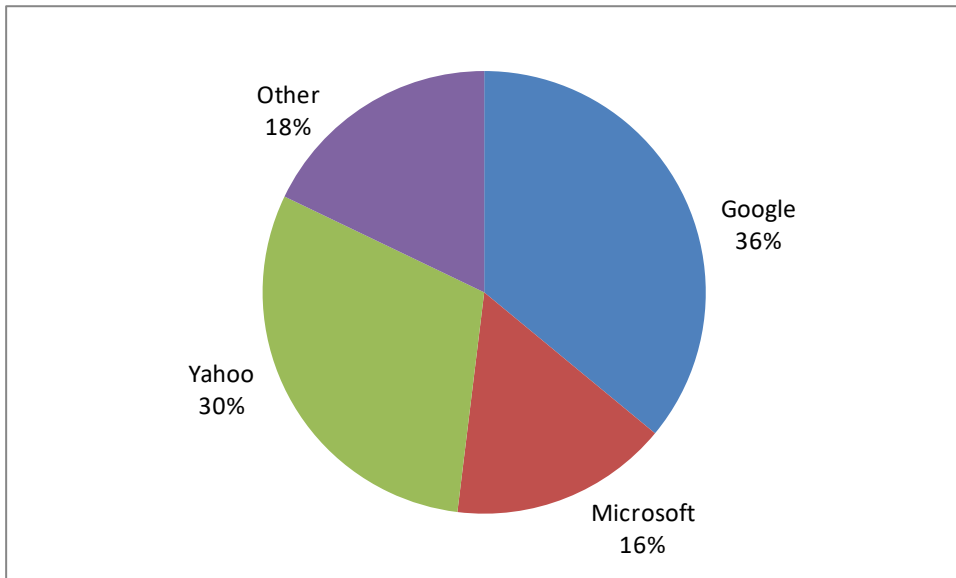
2.49



2.50 Canada

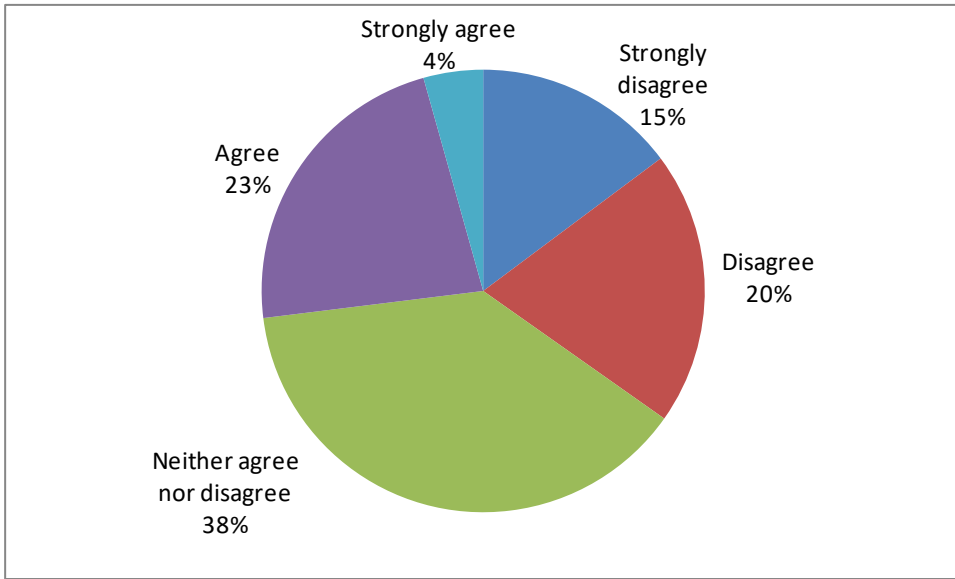


United States



There are considerable differences between the two countries.

2.51



More students disagree than agree.

2.52

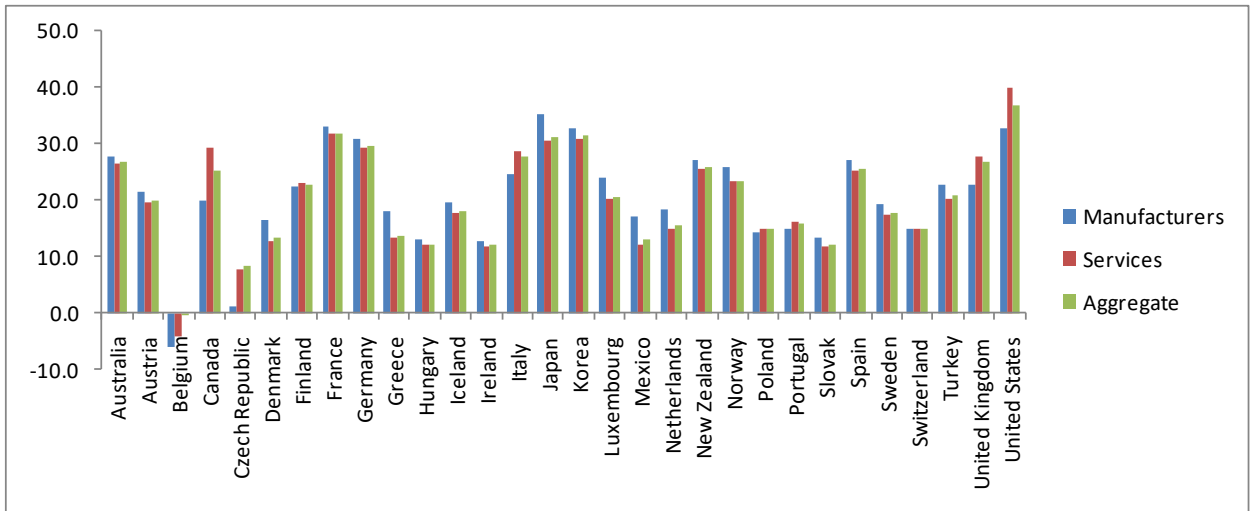
3	Count of Customer	Children		
4	Rate	Children	No children	Grand Total
5	Poor	4	13	17
6	Fair	13	30	43
7	Good	28	40	68
8	Very good	43	25	68
9	Excellent	20	4	24
10	Grand Total	108	112	220

3	Count of Customer	Children		
4	Rate	Children	No children	Grand Total
5	Poor	4%	12%	8%
6	Fair	12%	27%	20%
7	Good	26%	36%	31%
8	Very good	40%	22%	31%
9	Excellent	19%	4%	11%
10	Grand Total	100%	100%	100%



Customers with children rated the restaurant more highly than did customers with no children.

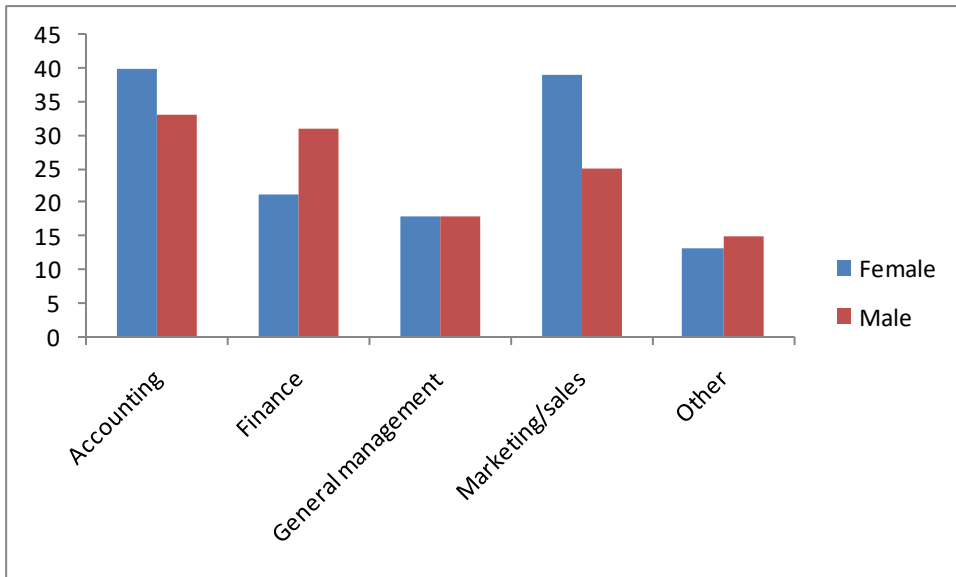
2.53



There is a great deal of variation between countries. Moreover some countries tax manufacturers more and some countries tax services more. The United States has the highest corporate tax rates.

2.54

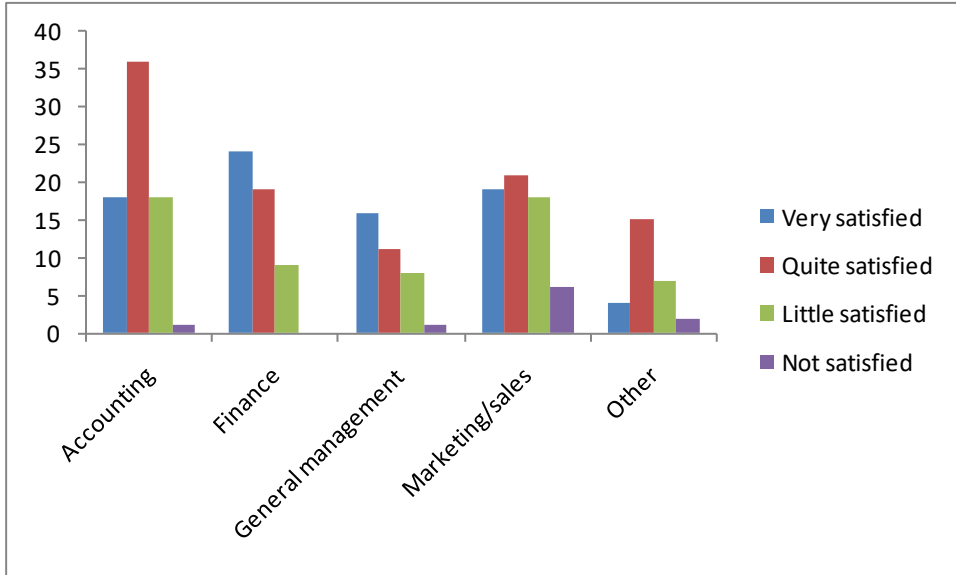
Count of ID number	Gender		
Area	Female	Male	Grand Total
Accounting	40	33	73
Finance	21	31	52
General management	18	18	36
Marketing/sales	39	25	64
Other	13	15	28
Grand Total	131	122	253



Males and females differ in their areas of employment. Females tend to choose accounting marketing/sales and males opt for finance.

b

Count of ID number	Satisfaction				
Area	Very satisfied	Quite satisfied	Little satisfied	Not satisfied	Grand Total
Accounting	18	36	18	1	73
Finance	24	19	9		52
General management	16	11	8	1	36
Marketing/sales	16	21	18	6	64
Other	15	7	7	2	28
Grand Total	102	60	60	10	253



Area and job satisfaction are related. Graduates who work in finance and general management appear to be more satisfied than those in accounting, marketing/sales, and others.



