APPLICATION OF MEASURES OF CENTRAL TENDENCY

Hardik agarwal
Roll no. – B019
Deval Shah
Roll No. – B017
Gautam
Roll No. – B018

MEAN

- When we speak about averages, we are referring to the mean. If you were to take ten numbers, add them all up, and then divide by ten, you would have calculated the mean
- It's how we talk about the average height or weight of a group of people, the average number of books people have,etc

ADVANTAGES/IMP. PROPERTY OF MEAN

An important property of the mean is that it includes every value in your data set as part of the calculation.

In addition, the mean is the only measure of central tendency where the sum of the deviations of each value from the mean is always zero(CENTRE OF THE GRAVITY).

SOMETIMES USING MEAN IS MISLEADING: HOW??

As when we talk about mean annual income.

For example, 90% of households in the usa earn less than $149 999 while 0.1% earn a million dollars or more. Even though a tiny number of people earn vastly higher incomes, their income is so much higher that they 'pull' the mean income higher with them. It makes it look like the 'average' household earns a lot more than they really do.

In the case of income, it usually makes more sense to use the median.

EXAMPLE:

- One main disadvantage: it is particularly susceptible to the influence of outliers. These are values that are unusual compared to the rest of the data set by being especially small or large in numerical value. For example, consider the wages of staff at a factory below:
- The mean salary for these ten staff is $30.7k.
- But most workers have salaries in the $12k to 18k range.
- The mean is being skewed by the two large salaries, i.E. 90k & 95k

Staff	1	2	3	4	5	6	7	8	9	10
Salary	15k	18k	16k	14k	15k	15k	12k	17k	90k	95k

MEDIAN

MEDIAN

The median is used much less often even though it is a very descriptive and meaningful term.

The median is the data value in the middle of an ordered array. The same number of data values are on either side of the median value. For the numbers 1,2,3,4, and 1,000,000, their median is 3. The median is not affected by the outlier and thus is a resistant measure. Unless the data is skewed or contains outliers, the mean and median usually have similar values.

This measure tells you the point at which half the numbers are larger and half the numbers are smaller. The median is a very useful number to use when the distribution of data is skewed – for instance, most of the numbers are small and a few are extremely large.

When we talk about income, this is the number where half of people earn more and half of people earn less. Thus, using (slightly old 2004) US census data, the mean household income was $60,528 whereas the median income

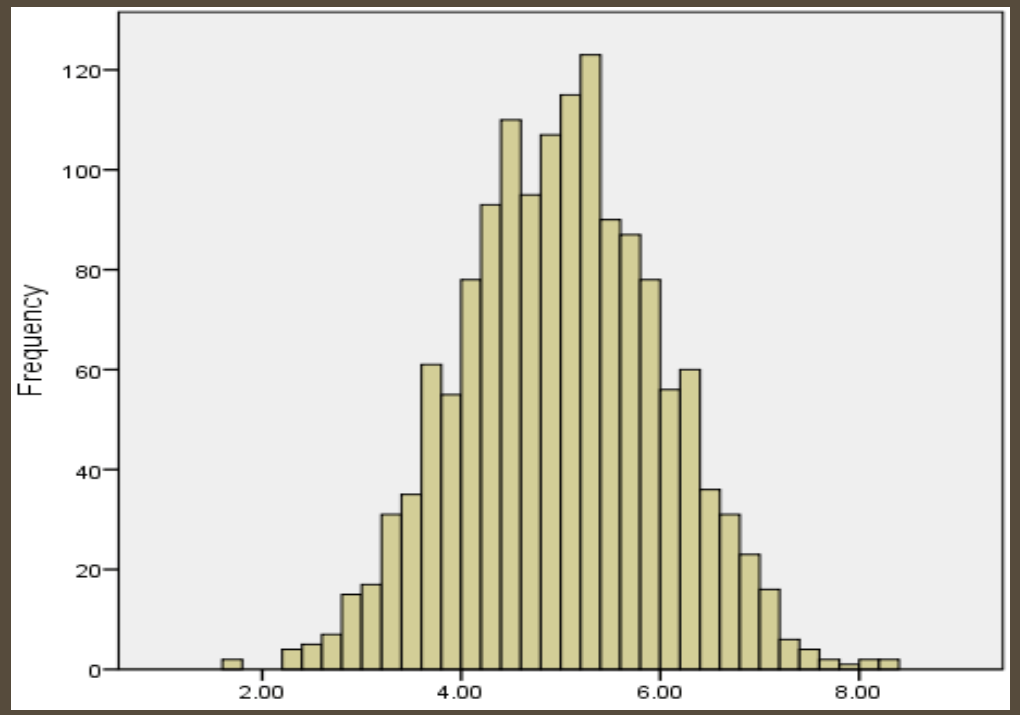
WHEN SHOULD BE PREFER USING MEDIAN OVER MEAN????

Time when we usually prefer the median over the mean (or mode) is when our data is skewed (i.E., The frequency distribution for our data is skewed).

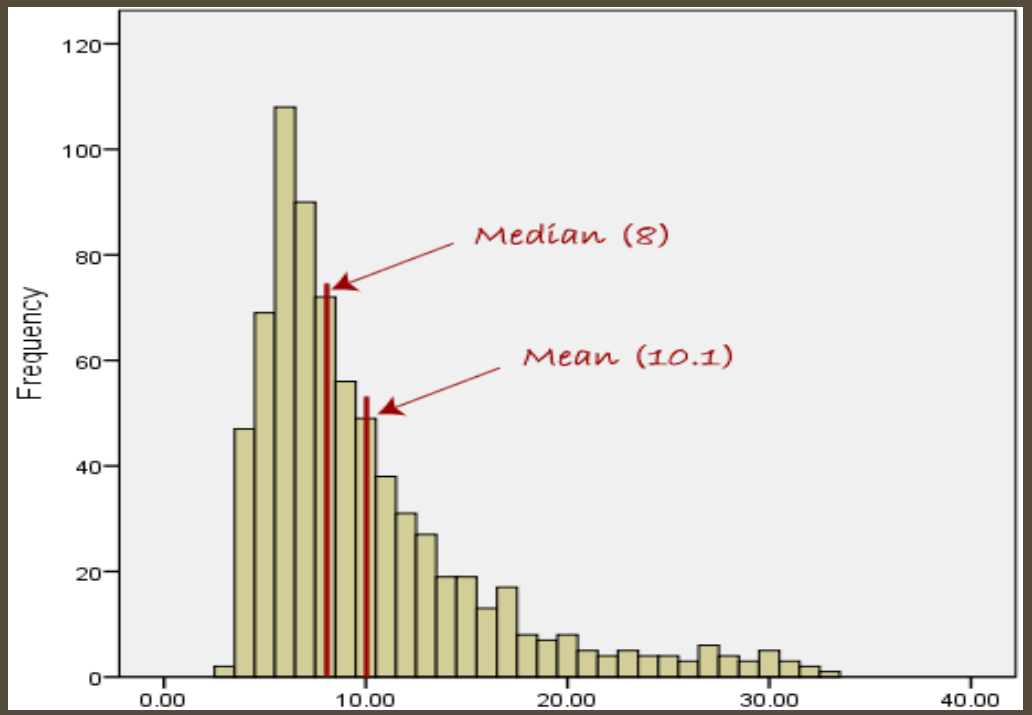
As the data becomes skewed the mean loses its ability to provide the best central location for the data because the skewed data is dragging it away from the typical value. However, the median best retains this position and is not as strongly influenced by the skewed values

WHEN SHOULD BE PREFER USING MEDIAN OVER MEAN????

SYMMETRICAL DATA



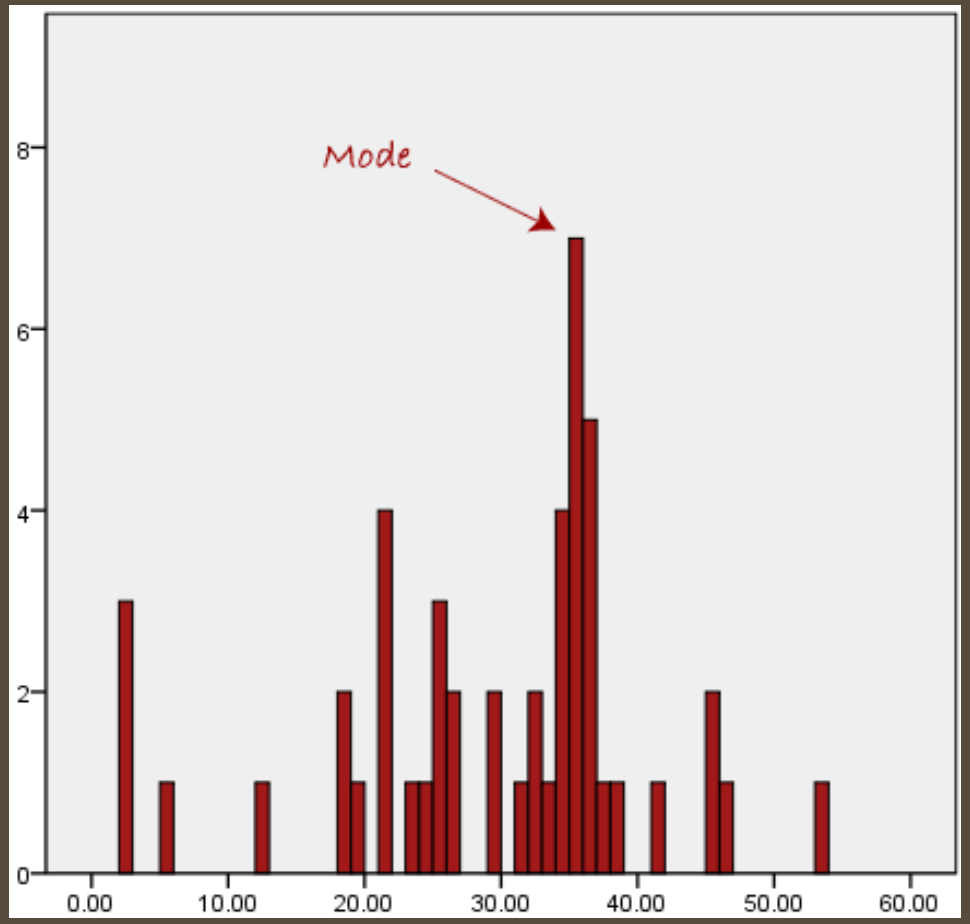
SKEWED(ASYMMETRICAL)DATA



MODE

MODE

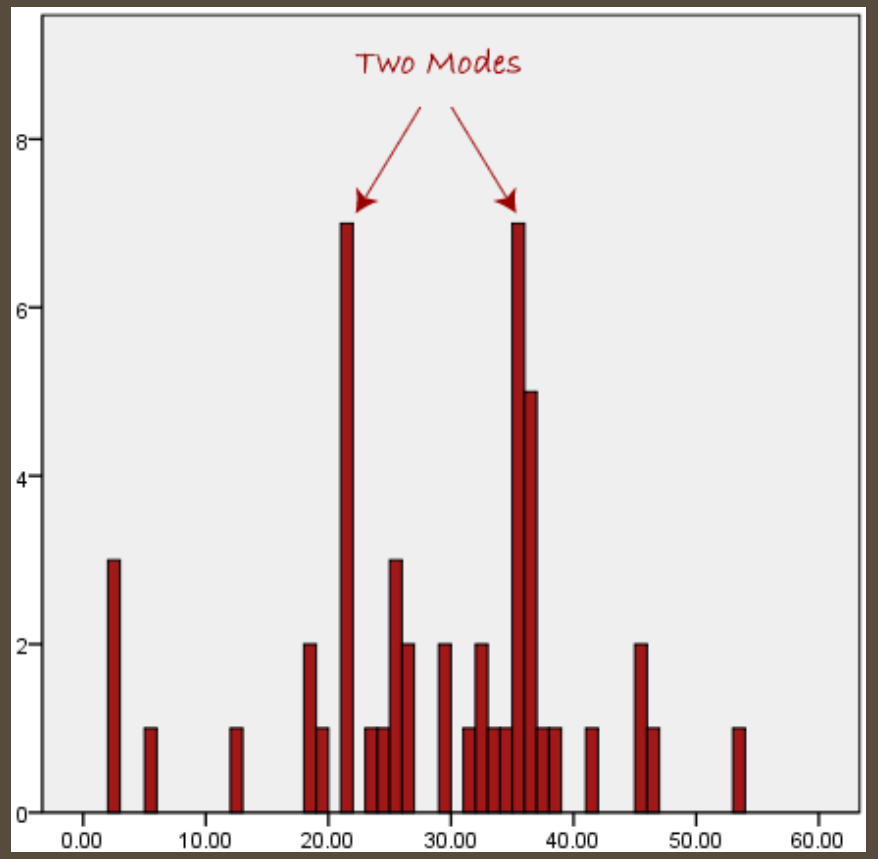
The mode is the most frequent score in our data set. On a histogram it represents the highest bar in a bar chart or histogram. You can, therefore, sometimes consider the mode as being the most popular option.



DISADVANTAGE OF MODE

This is particularly problematic when we have continuous data because we are more likely not to have any one value that is more frequent than the other. For example, consider measuring 30 peoples' weight (to the nearest 0.1 kg). How likely is it that we will find two or more people with **exactly** the same weight (e.g., 67.4 kg)? The answer, is probably very unlikely – many people might be close, but with such a small sample (30 people) and a large range of possible weights, you are unlikely to find two people with exactly the same weight; that is, to the nearest 0.1 kg.

This is why the mode is very rarely used with continuous data.



NORMAL AN SKEWED DISTRIBUTIONS

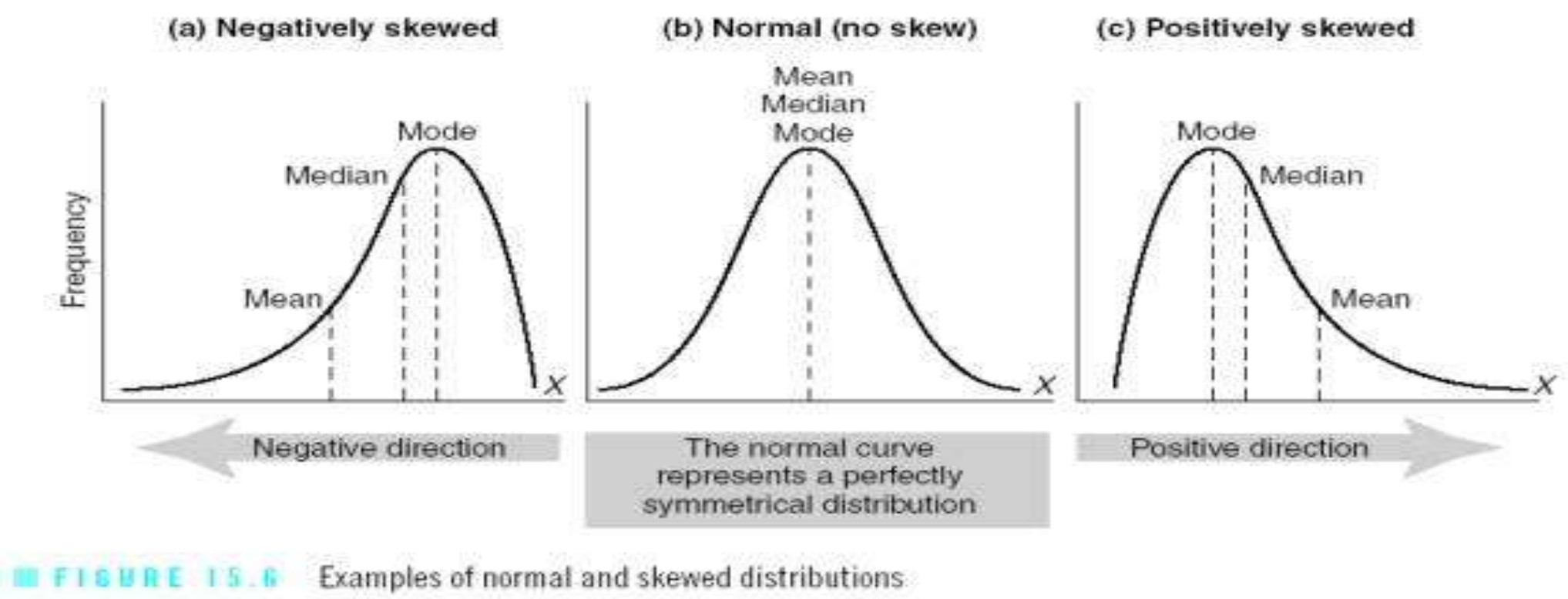


FIGURE 15.6 Examples of normal and skewed distributions

WHAT IS THE DECIDING FACTOR OF WHEN TO USE WHICH CENTRAL TENDENCY?

TYPES OF VARIABLE:

QUALITATIVE DATA: 1. NOMINAL 2. ORDINAL

1.NOMINAL-data that represents whether a variable possesses some characteristic

Eg.1= MALE &2= FEMALE -can't compare a 2 to a 1 and say one is better or worse.

2.ORDINAL-represents categories that have some associated order.

An example would be 1 = strongly disagree, 2 = disagree, 3= no opinion, 4= agree, and 5= strongly agree.

WHAT IS THE DECIDING FACTOR OF WHEN TO USE WHICH CENTRAL TENDENCY?

QUANTITATIVE DATA:

1. INTERVAL: . If data can be ordered and the arithmetic difference is meaningful, the data is interval.

Eg. $93^\circ - 86^\circ = 7^\circ$ means it is 7 degrees warmer, so this has meaning.

The property that distinguishes interval notation is the notion that subtracting to get equal intervals represents equal amounts of change.

NOTE:0° has been arbitrarily selected at different places

2. RATIO:is similar to interval data, except that it has a meaningful zero point and the ratio of 2 data points is meaningful.

If you scored an 88% and I only scored a 44%, then you got twice as many points as I did. Here a ratio of data is meaningful because your score is really twice as much as mine. Here.

zero is not arbitrarily set. It represents a definite amount

BEST MEASURE OF C.T FOR A PARTICULAR TYPE OF VARIABLE:

Type of Variable	Best measure of central tendency
Nominal	Mode
Ordinal	Median
Interval/Ratio (not skewed)	Mean
Interval/Ratio (skewed)	Median

A data is given to us by a leading educational website and a report is asked.

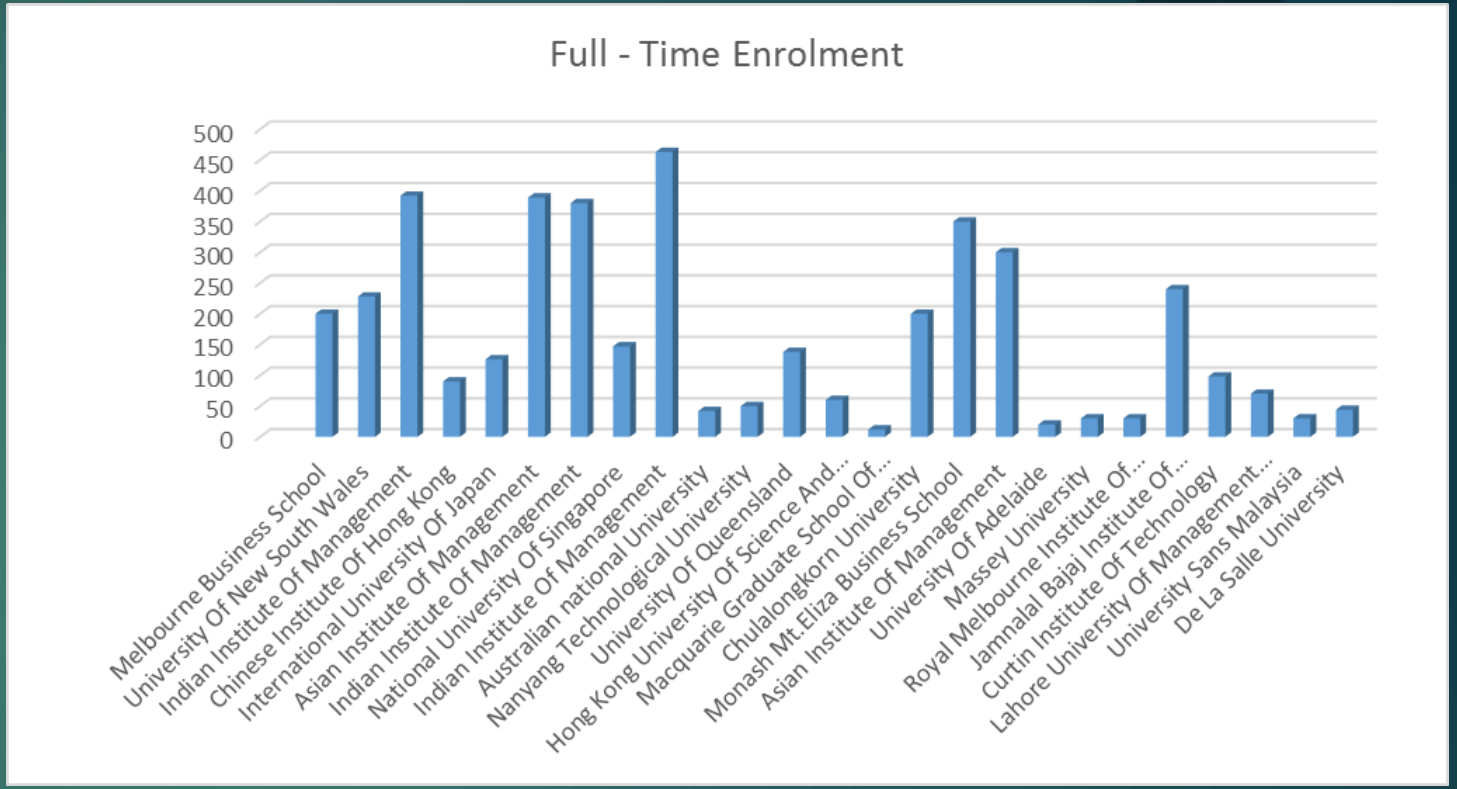
The questions of the report follow

Sr, No.	School Name	Location	Full - Time Enrolment	Student per Faculty	Local Tuition ($)	Foreign	age	%Foreign	GMAT	English	Work Experience	Starting Salary ($)
1	Melbourne Business School	Melbourne	200	5	24,420.00	29,600.00	28	47	Yes	No	Yes	71400
2	University Of New South Wales	Sydney	228	4	19,993.00	32,582.00	29	28	Yes	No	Yes	65200
3	Indian Institute Of Management	Ahmedabad	392	5	4,300.00	4,300.00	22	0	No	No	No	7100
4	Chinese Institute Of Hong Kong	Hong Kong	90	5	11,140.00	11,140.00	29	10	Yes	No	No	31000
5	International University Of Japan	Niigata	126	4	33,060.00	33,060.00	28	60	Yes	Yes	No	87000
6	Asian Institute Of Management	Manila	389	5	7,562.00	9,000.00	25	50	Yes	No	Yes	22800
7	Indian Institute Of Management	Bangalore	380	5	3,953.00	16,000.00	23	1	Yes	No	No	7500
8	National University Of Singapore	Singapore	147	6	6,146.00	7,170.00	29	51	Yes	Yes	Yes	43300
9	Indian Institute Of Management	Calcutta	463	8	2,880.00	16,000.00	23	0	No	No	No	7400
10	Australian national University	Canberra	42	2	20,300.00	20,300.00	30	80	Yes	Yes	Yes	46600
11	Nanyang Technological University	Singapore	50	5	8,500.00	8,500.00	32	20	Yes	No	Yes	49300
12	University Of Queensland	Brisbane	138	17	16,000.00	22,800.00	32	26	No	No	Yes	49600
13	Hong Kong University Of Science And Technology	Hong Kong	60	2	11,513.00	11,513.00	26	37	Yes	No	Yes	34000
14	Macquarie Graduate School Of Management	Sydney	12	8	17,172.00	19,778.00	34	27	No	No	Yes	60100
15	Chulalongkorn University	Bangkok	200	7	17,355.00	17,355.00	25	6	Yes	No	Yes	17600
16	Monash Mt.Eliza Business School	Melbourne	350	13	16,200.00	22,500.00	30	30	Yes	Yes	Yes	52500
17	Asian Institute Of Management	Bangkok	300	10	18,200.00	18,200.00	29	90	No	Yes	Yes	25000
18	University Of Adelaide	Adelaide	20	19	16,426.00	23,100.00	30	10	No	No	Yes	66000
19	Massey University	New Zealand	30	15	13,106.00	21,625.00	37	35	No	Yes	Yes	41400
20	Royal Melbourne Institute Of Technology Business Graduate School	Melbourne	30	7	13,880.00	17,765.00	32	30	No	Yes	Yes	48900
21	Jamnalal Bajaj Institute Of Management Studies	Mumbai	240	9	1,000.00	1,000.00	24	0	No	Yes	Yes	7000
22	Curtin Institute Of Technology	Perth	98	15	9,475.00	19,097.00	29	43	Yes	Yes	Yes	55000
23	Lahore University Of Management Sciences	Lahore	70	14	11,250.00	26,300.00	23	2.5	No	No	No	7500
24	University Sans Malaysia	Penang	30	5	2,260.00	2,260.00	32	15	No	Yes	Yes	16000
25	De La Salle University	Manila	44	17	3,300.00	3,600.00	28	3.5	Yes	Yes	Yes	13100

Q1 - Find the average of all the columns and compare it to the max and min

Full Time Enrollment

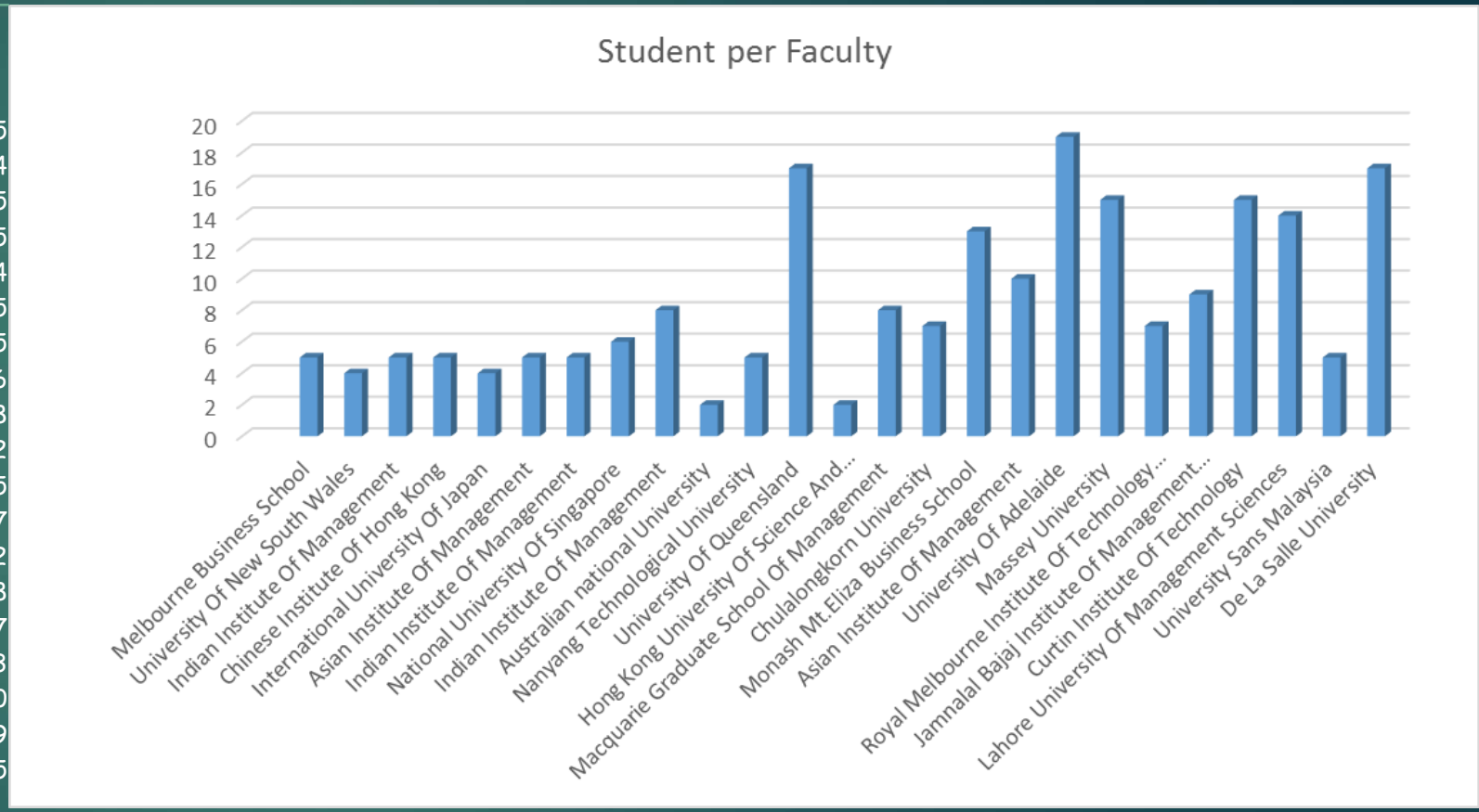
Sr, No.	School Name	Full - Time Enrolment
1	Melbourne Business School	200
2	University Of New South Wales	228
3	Indian Institute Of Management	392
4	Chinese Institute Of Hong Kong	90
5	International University Of Japan	126
6	Asian Institute Of Management	389
7	Indian Institute Of Management	380
8	National University Of Singapore	147
9	Indian Institute Of Management	463
10	Australian national University	42
11	Nanyang Technological University	50
12	University Of Queensland	138
13	Hong Kong University Of Science And Technology	60
14	Macquarie Graduate School Of Management	12
15	Chulalongkorn University	200
16	Monash Mt.Eliza Business School	350
17	Asian Institute Of Management	300
18	University Of Adelaide	20
19	Massey University	30
20	Royal Melbourne Institute Of Technology Business Graduate School	30
21	Jamnalal Bajaj Institute Of Management Studies	240
22	Curtin Institute Of Technology	98
23	Lahore University Of Management Sciences	70
24	University Sans Malaysia	30
25	De La Salle University	44



MEAN : 165.16
MAX : 463 (IIM - Calcutta)
MIN : 12(Macquarie Graduate School Of Management)

Student per Faculty

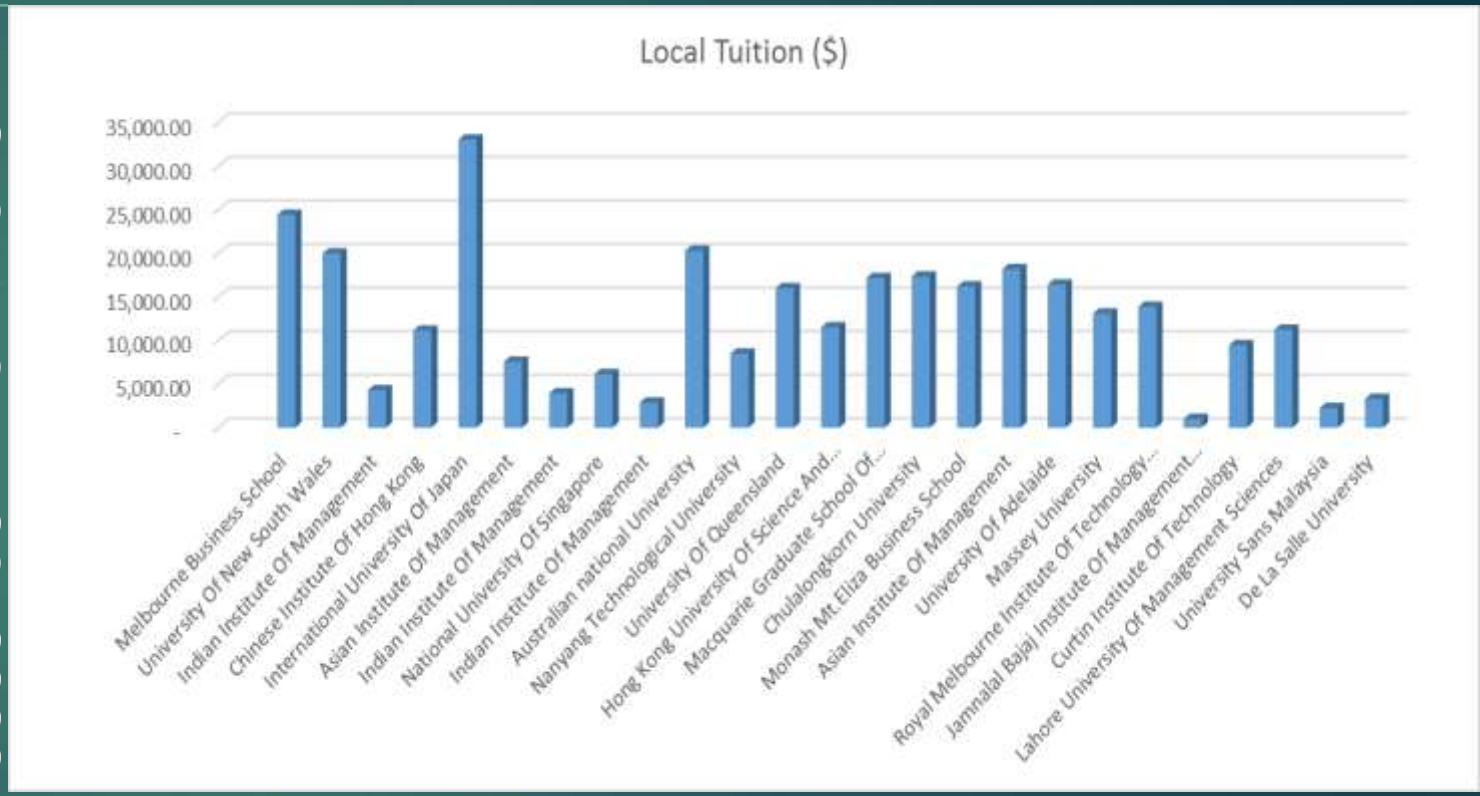
Sr, No.	School Name	Student per Faculty
1	Melbourne Business School	5
2	University Of New South Wales	4
3	Indian Institute Of Management	5
4	Chinese Institute Of Hong Kong	5
5	International University Of Japan	4
6	Asian Institute Of Management	5
7	Indian Institute Of Management	5
8	National University Of Singapore	6
9	Indian Institute Of Management	8
10	Australian national University	2
11	Nanyang Technological University	5
12	University Of Queensland	17
13	Hong Kong University Of Science And Technology	2
14	Macquarie Graduate School Of Management	8
15	Chulalongkorn University	7
16	Monash Mt.Eliza Business School	13
17	Asian Institute Of Management	10
18	University Of Adelaide	19
19	Massey University	15
20	Royal Melbourne Institute Of Technology Business Graduate School	7
21	Jamnalal Bajaj Institute Of Management Studies	9
22	Curtin Institute Of Technology	15
23	Lahore University Of Management Sciences	14
24	University Sans Malaysia	5
25	De La Salle University	17



MEAN : 8.48
MAX : 19 (University Of Adelaide)
MIN : 2 (Hong Kong University Of Science And Technology)

Local Tuition

Sr, No.	School Name	Local Tuition ($)
1	Melbourne Business School	24,420.00
2	University Of New South Wales	19,993.00
3	Indian Institute Of Management	4,300.00
4	Chinese Institute Of Hong Kong	11,140.00
5	International University Of Japan	33,060.00
6	Asian Institute Of Management	7,562.00
7	Indian Institute Of Management	3,953.00
8	National University Of Singapore	6,146.00
9	Indian Institute Of Management	2,880.00
10	Australian national University	20,300.00
11	Nanyang Technological University	8,500.00
12	University Of Queensland	16,000.00
13	Hong Kong University Of Science And Technology	11,513.00
14	Macquarie Graduate School Of Management	17,172.00
15	Chulalongkorn University	17,355.00
16	Monash Mt.Eliza Business School	16,200.00
17	Asian Institute Of Management	18,200.00
18	University Of Adelaide	16,426.00
19	Massey University	13,106.00
20	Royal Melbourne Institute Of Technology Business Graduate School	13,880.00
21	Jamnalal Bajaj Institute Of Management Studies	1,000.00
22	Curtin Institute Of Technology	9,475.00
23	Lahore University Of Management Sciences	11,250.00
24	University Sans Malaysia	2,260.00
25	De La Salle University	3,300.00



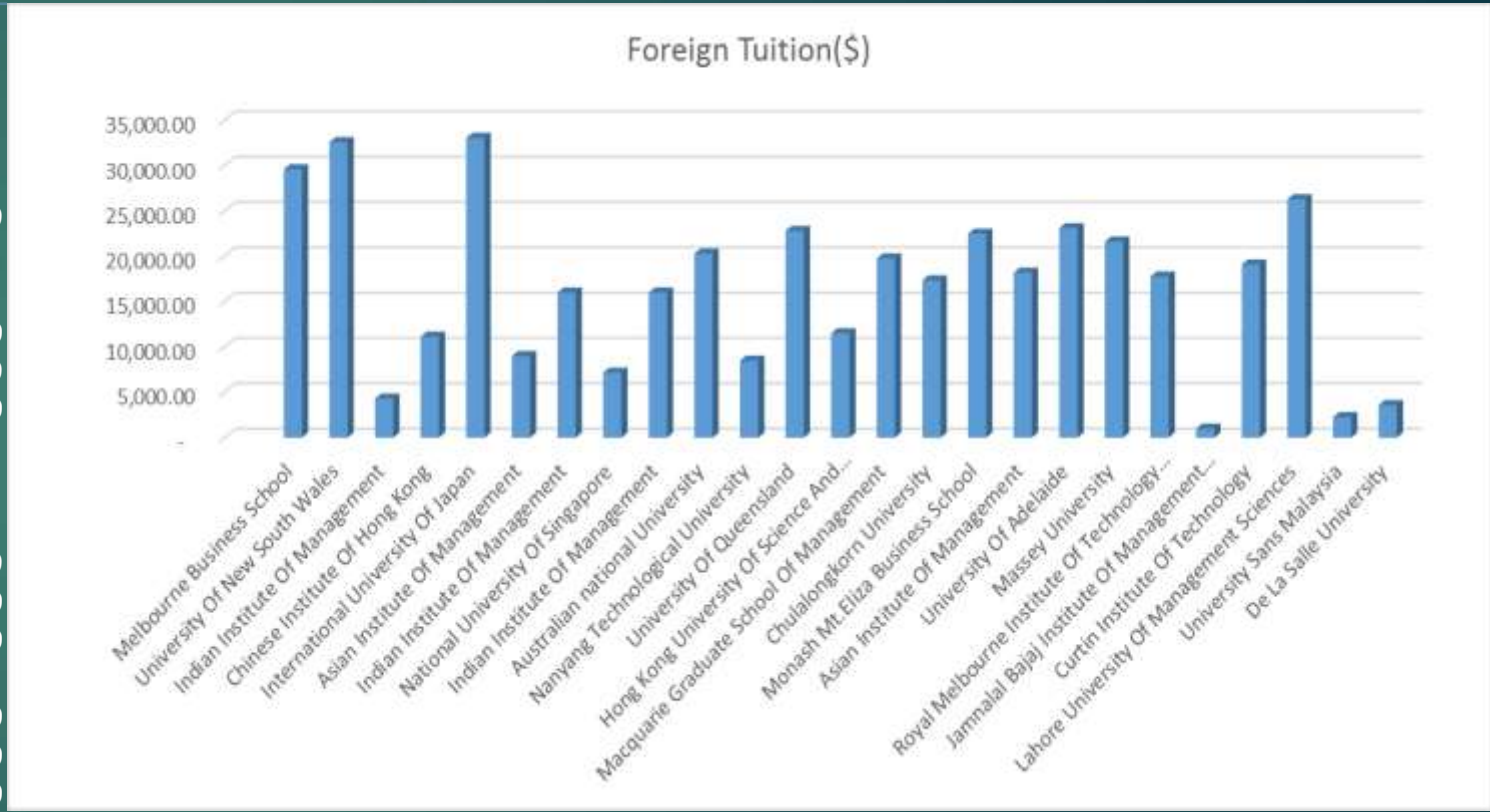
MEAN : 12,375.64

MAX : 33060 (International University Of Japan)

MIN : 1000 (Jamnalal Bajaj Institute Of Management Studies)

Foreign Tuition ($)

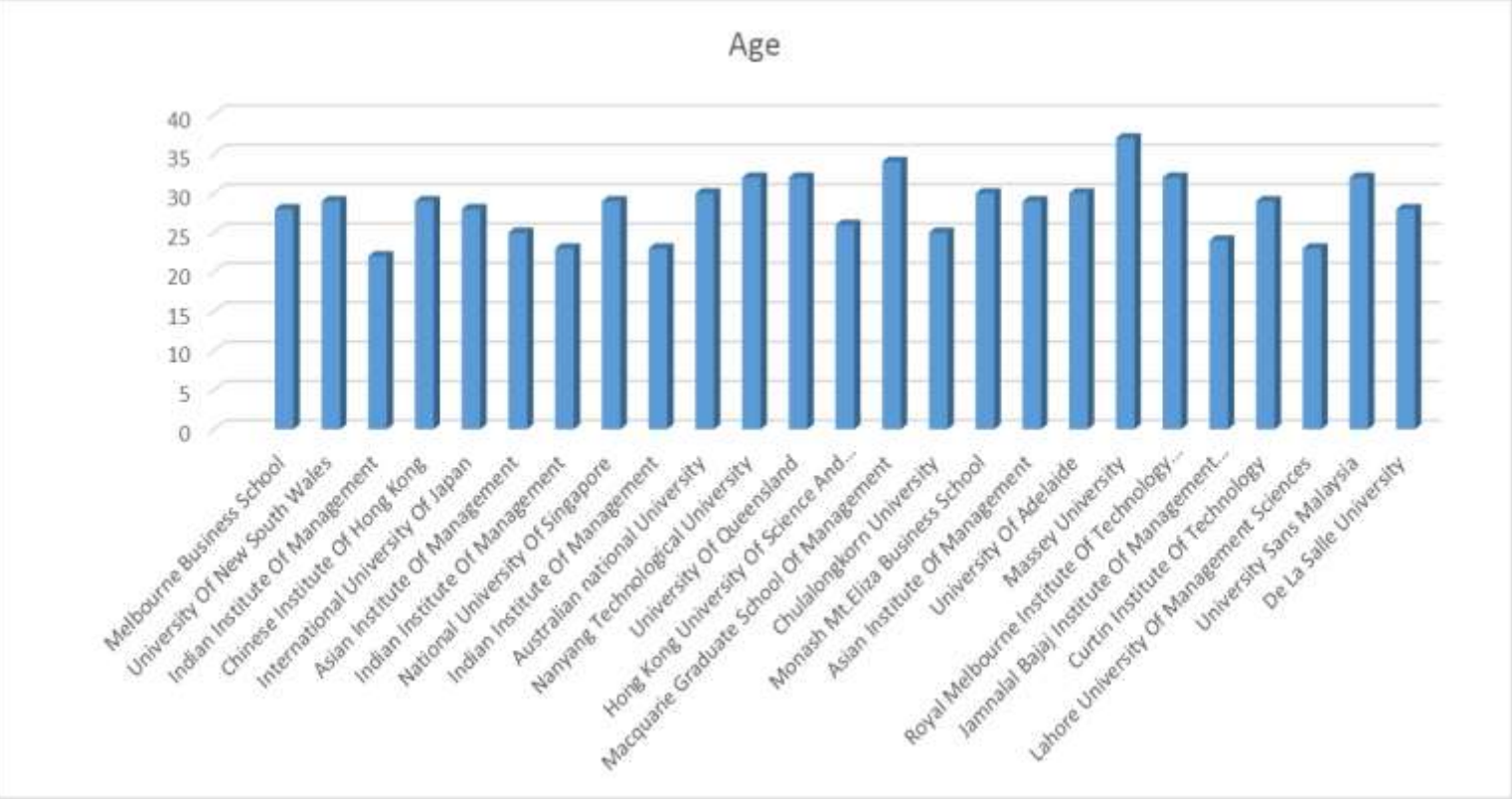
Sr, No.	School Name	Foreign Tuition($)
1	Melbourne Business School	29,600.00
2	University Of New South Wales	32,582.00
3	Indian Institute Of Management	4,300.00
4	Chinese Institute Of Hong Kong	11,140.00
5	International University Of Japan	33,060.00
6	Asian Institute Of Management	9,000.00
7	Indian Institute Of Management	16,000.00
8	National University Of Singapore	7,170.00
9	Indian Institute Of Management	16,000.00
10	Australian national University	20,300.00
11	Nanyang Technological University	8,500.00
12	University Of Queensland	22,800.00
13	Hong Kong University Of Science And Technology	11,513.00
14	Macquarie Graduate School Of Management	19,778.00
15	Chulalongkorn University	17,355.00
16	Monash Mt.Eliza Business School	22,500.00
17	Asian Institute Of Management	18,200.00
18	University Of Adelaide	23,100.00
19	Massey University	21,625.00
20	Royal Melbourne Institute Of Technology Business Graduate School	17,765.00
21	Jamnalal Bajaj Institute Of Management Studies	1,000.00
22	Curtin Institute Of Technology	19,097.00
23	Lahore University Of Management Sciences	26,300.00
24	University Sans Malaysia	2,260.00
25	De La Salle University	3,600.00



MEAN : 16581.8
MAX : 33060 (International University Of Japan)
MIN : 1000 (Jamnalal Bajaj Institute Of Management Studies)

Age

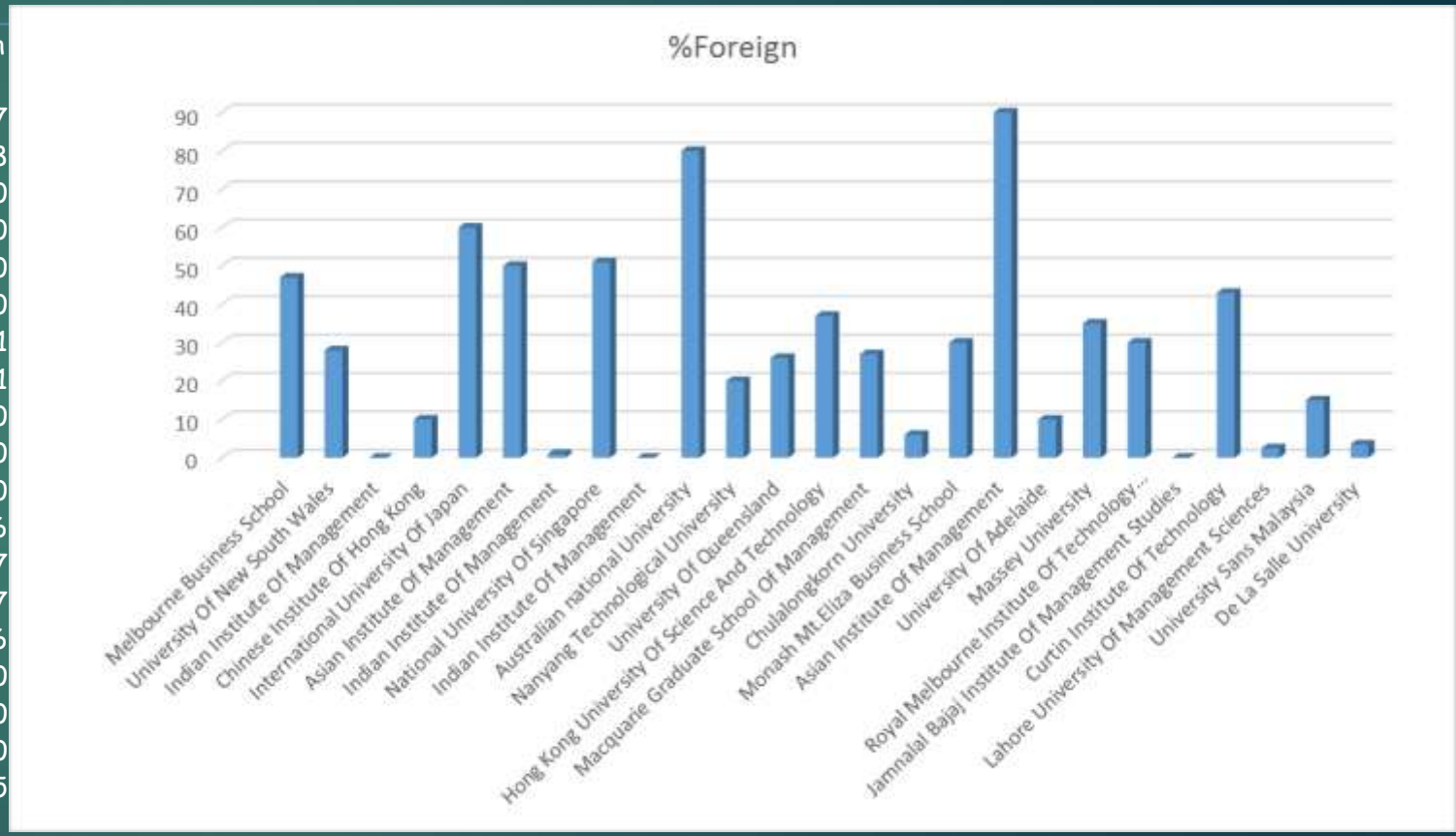
Sr, No.	School Name	age
1	Melbourne Business School	28
2	University Of New South Wales	29
3	Indian Institute Of Management	22
4	Chinese Institute Of Hong Kong	29
5	International University Of Japan	28
6	Asian Institute Of Management	25
7	Indian Institute Of Management	23
8	National University Of Singapore	29
9	Indian Institute Of Management	23
10	Australian national University	30
11	Nanyang Technological University	32
12	University Of Queensland	32
13	Hong Kong University Of Science And Technology	26
14	Macquarie Graduate School Of Management	34
15	Chulalongkorn University	25
16	Monash Mt.Eliza Business School	30
17	Asian Institute Of Management	29
18	University Of Adelaide	30
19	Massey University	37
20	Royal Melbourne Institute Of Technology Business Graduate School	32
21	Jamnalal Bajaj Institute Of Management Studies	24
22	Curtin Institute Of Technology	29
23	Lahore University Of Management Sciences	23
24	University Sans Malaysia	32
25	De La Salle University	28



MEAN : 28.36
MAX : 37 (Massey University)
MIN : 22 (Indian Institute Of Management - A)

% of Foreign Students

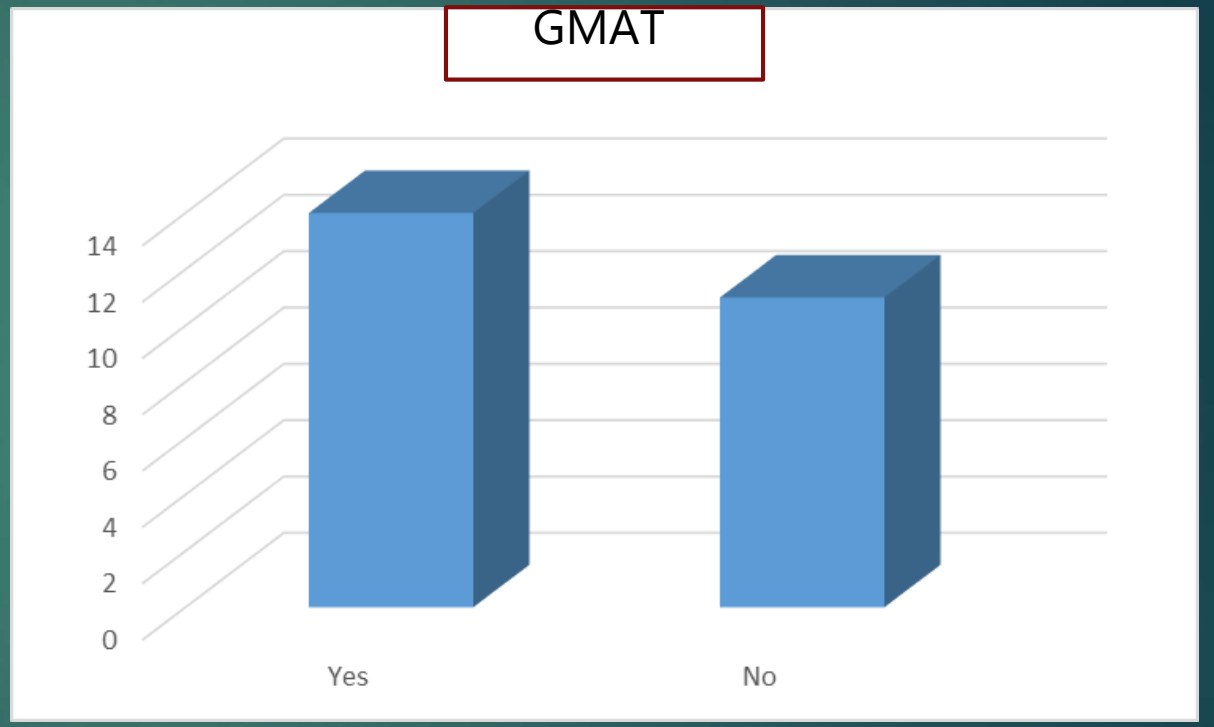
Sr, No.	School Name	%Foreign
1	Melbourne Business School	47
2	University Of New South Wales	28
3	Indian Institute Of Management	0
4	Chinese Institute Of Hong Kong	10
5	International University Of Japan	60
6	Asian Institute Of Management	50
7	Indian Institute Of Management	1
8	National University Of Singapore	51
9	Indian Institute Of Management	0
10	Australian national University	80
11	Nanyang Technological University	20
12	University Of Queensland	26
13	Hong Kong University Of Science And Technology	37
14	Macquarie Graduate School Of Management	27
15	Chulalongkorn University	6
16	Monash Mt.Eliza Business School	30
17	Asian Institute Of Management	90
18	University Of Adelaide	10
19	Massey University	35
20	Royal Melbourne Institute Of Technology Business Graduate School	30
21	Jamnalal Bajaj Institute Of Management Studies	0
22	Curtin Institute Of Technology	43
23	Lahore University Of Management Sciences	2.5
24	University Sans Malaysia	15
25	De La Salle University	3.5



MEAN : 28.08
MAX : 90 (Asian Institute Of Management)
MIN : 0 (Jamnalal Bajaj Institute Of Management Studies ,IIM – A , IIM - C)

Requirement of GMAT

Sr, No.	School Name	GMAT
1	Melbourne Business School	Yes
2	University Of New South Wales	Yes
3	Indian Institute Of Management	No
4	Chinese Institute Of Hong Kong	Yes
5	International University Of Japan	Yes
6	Asian Institute Of Management	Yes
7	Indian Institute Of Management	Yes
8	National University Of Singapore	Yes
9	Indian Institute Of Management	No
10	Australian national University	Yes
11	Nanyang Technological University	Yes
12	University Of Queensland	No
13	Hong Kong University Of Science And Technology	Yes
14	Macquarie Graduate School Of Management	No
15	Chulalongkorn University	Yes
16	Monash Mt.Eliza Business School	Yes
17	Asian Institute Of Management	No
18	University Of Adelaide	No
19	Massey University	No
20	Royal Melbourne Institute Of Technology Business Graduate School	No
21	Jamnalal Bajaj Institute Of Management Studies	No
22	Curtin Institute Of Technology	Yes
23	Lahore University Of Management Sciences	No
24	University Sans Malaysia	No
25	De La Salle University	Yes

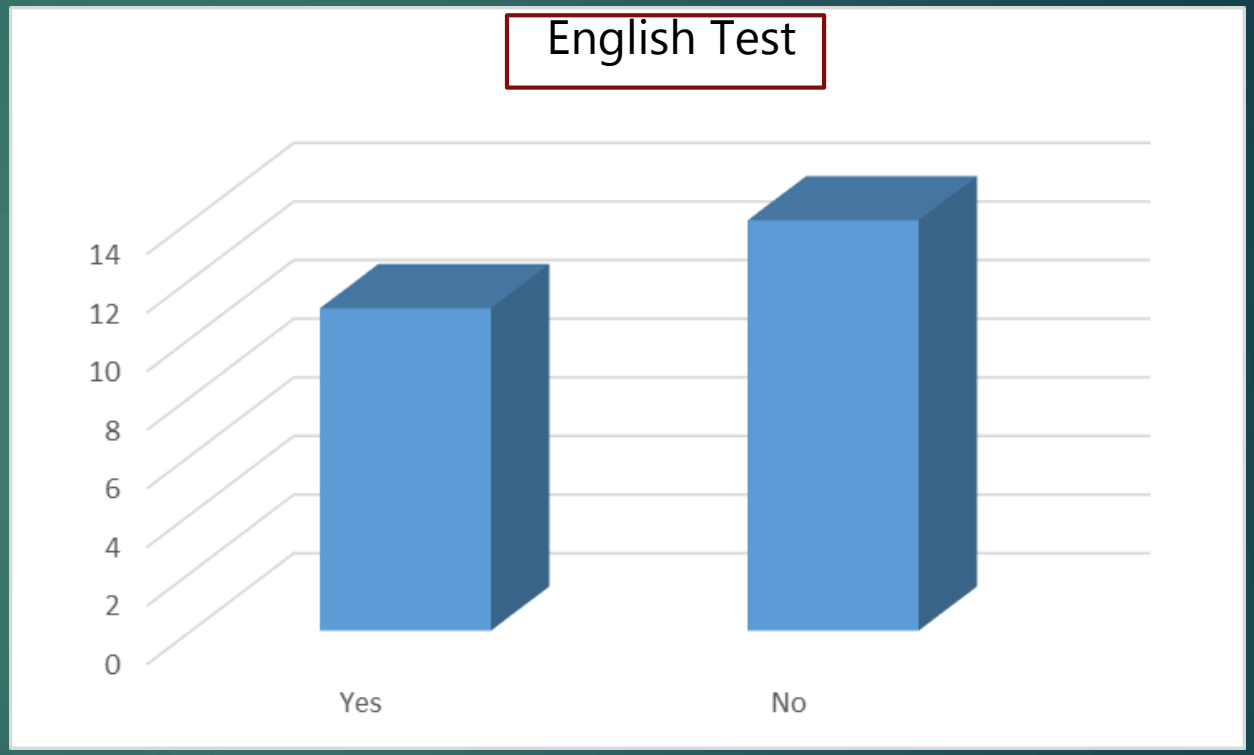


MODE - Yes

Clearly the graph shows that more universities require GMAT

Requirement of English Test

Sr, No.	School Name	English Test
1	Melbourne Business School	No
2	University Of New South Wales	No
3	Indian Institute Of Management	No
4	Chinese Institute Of Hong Kong	No
5	International University Of Japan	Yes
6	Asian Institute Of Management	No
7	Indian Institute Of Management	No
8	National University Of Singapore	Yes
9	Indian Institute Of Management	No
10	Australian national University	Yes
11	Nanyang Technological University	No
12	University Of Queensland	No
13	Hong Kong University Of Science And Technology	No
14	Macquarie Graduate School Of Management	No
15	Chulalongkorn University	No
16	Monash Mt.Eliza Business School	Yes
17	Asian Institute Of Management	Yes
18	University Of Adelaide	No
19	Massey University	Yes
20	Royal Melbourne Institute Of Technology Business Graduate School	Yes
21	Jamnalal Bajaj Institute Of Management Studies	Yes
22	Curtin Institute Of Technology	Yes
23	Lahore University Of Management Sciences	No
24	University Sans Malaysia	Yes
25	De La Salle University	Yes
		No



MODE - No

Clearly the graph shows that less universities require English Test

Requirement of Work Experience

Sr, No.	School Name	Work Experience
1	Melbourne Business School	Yes
2	University Of New South Wales	Yes
3	Indian Institute Of Management	No
4	Chinese Institute Of Hong Kong	No
5	International University Of Japan	No
6	Asian Institute Of Management	Yes
7	Indian Institute Of Management	No
8	National University Of Singapore	Yes
9	Indian Institute Of Management	No
10	Australian national University	Yes
11	Nanyang Technological University	Yes
12	University Of Queensland	Yes
13	Hong Kong University Of Science And Technology	Yes
14	Macquarie Graduate School Of Management	Yes
15	Chulalongkorn University	Yes
16	Monash Mt.Eliza Business School	Yes
17	Asian Institute Of Management	Yes
18	University Of Adelaide	Yes
19	Massey University	Yes
20	Royal Melbourne Institute Of Technology Business Graduate School	Yes
21	Jamnalal Bajaj Institute Of Management Studies	Yes
22	Curtin Institute Of Technology	Yes
23	Lahore University Of Management Sciences	No
24	University Sans Malaysia	Yes
25	De La Salle University	Yes

MODE – Yes

Clearly the graph shows that more universities require Work Exp.

Starting Salary ($)

Sr, No.	School Name	Starting Salary ($)
1	Melbourne Business School	71400
2	University Of New South Wales	65200
3	Indian Institute Of Management	7100
4	Chinese Institute Of Hong Kong	31000
5	International University Of Japan	87000
6	Asian Institute Of Management	22800
7	Indian Institute Of Management	7500
8	National University Of Singapore	43300
9	Indian Institute Of Management	7400
10	Australian national University	46600
11	Nanyang Technological University	49300
12	University Of Queensland	49600
13	Hong Kong University Of Science And Technology	34000
14	Macquarie Graduate School Of Management	60100
15	Chulalongkorn University	17600
16	Monash Mt.Eliza Business School	52500
17	Asian Institute Of Management	25000
18	University Of Adelaide	66000
19	Massey University	41400
20	Royal Melbourne Institute Of Technology Business Graduate School	48900
21	Jamnalal Bajaj Institute Of Management Studies	7000
22	Curtin Institute Of Technology	55000
23	Lahore University Of Management Sciences	7500
24	University Sans Malaysia	16000
25	De La Salle University	13100

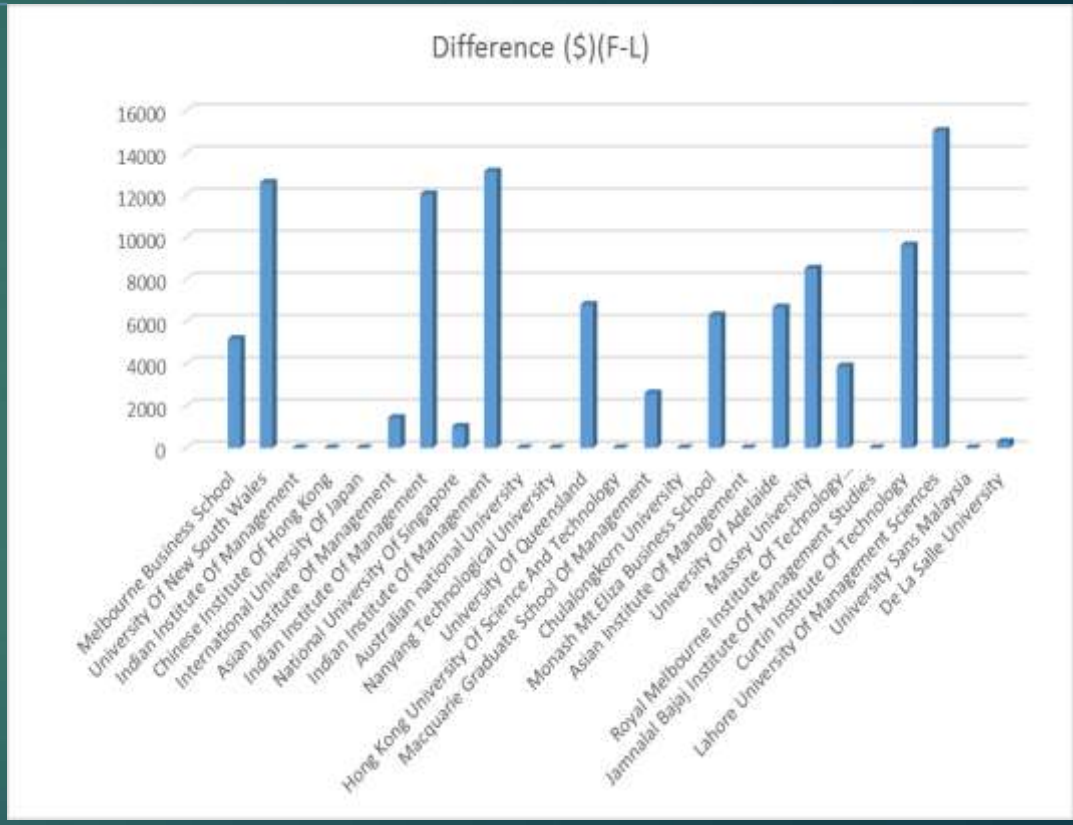
MEAN : 37292

MAX : 87000 (International University Of Japan)

MIN : 7000 (Jamnalal Bajaj Institute Of Management Studies)

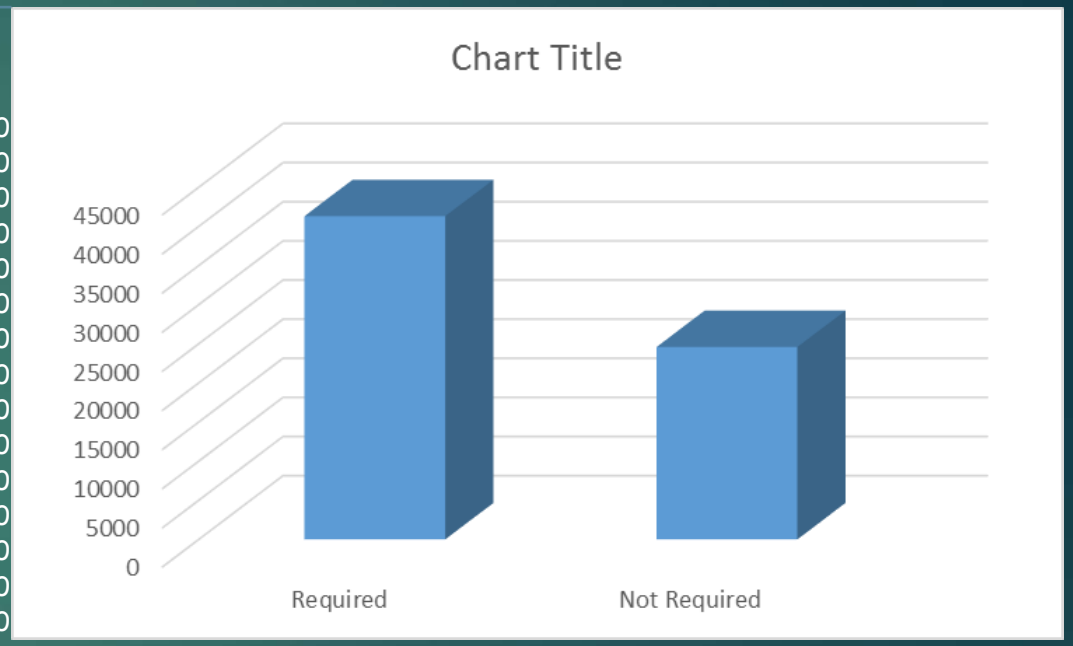
Question 2 – Compare Any difference b/w local and foreign tuition costs

Sr, No.	School Name	Local Tuition ($)	Foreign Tuition($)	Difference ($)(F-L)
1	Melbourne Business School	24,420.00	29,600.00	5,180.00
2	University Of New South Wales	19,993.00	32,582.00	12,589.00
3	Indian Institute Of Management	4,300.00	4,300.00	-
4	Chinese Institute Of Hong Kong	11,140.00	11,140.00	-
5	International University Of Japan	33,060.00	33,060.00	-
6	Asian Institute Of Management	7,562.00	9,000.00	1,438.00
7	Indian Institute Of Management	3,953.00	16,000.00	12,047.00
8	National University Of Singapore	6,146.00	7,170.00	1,024.00
9	Indian Institute Of Management	2,880.00	16,000.00	13,120.00
10	Australian national University	20,300.00	20,300.00	-
11	Nanyang Technological University	8,500.00	8,500.00	-
12	University Of Queensland	16,000.00	22,800.00	6,800.00
13	Hong Kong University Of Science And Technology	11,513.00	11,513.00	-
14	Macquarie Graduate School Of Management	17,172.00	19,778.00	2,606.00
15	Chulalongkorn University	17,355.00	17,355.00	-
16	Monash Mt.Eliza Business School	16,200.00	22,500.00	6,300.00
17	Asian Institute Of Management	18,200.00	18,200.00	-
18	University Of Adelaide	16,426.00	23,100.00	6,674.00
19	Massey University	13,106.00	21,625.00	8,519.00
20	Royal Melbourne Institute Of Technology Business Graduate School	13,880.00	17,765.00	3,885.00
21	Jamnalal Bajaj Institute Of Management Studies	1,000.00	1,000.00	-
22	Curtin Institute Of Technology	9,475.00	19,097.00	9,622.00
23	Lahore University Of Management Sciences	11,250.00	26,300.00	15,050.00
24	University Sans Malaysia	2,260.00	2,260.00	-
25	De La Salle University	3,300.00	3,600.00	300.00



Q3 - Any difference between mean starting salaries for schools requiring and not requiring work experience

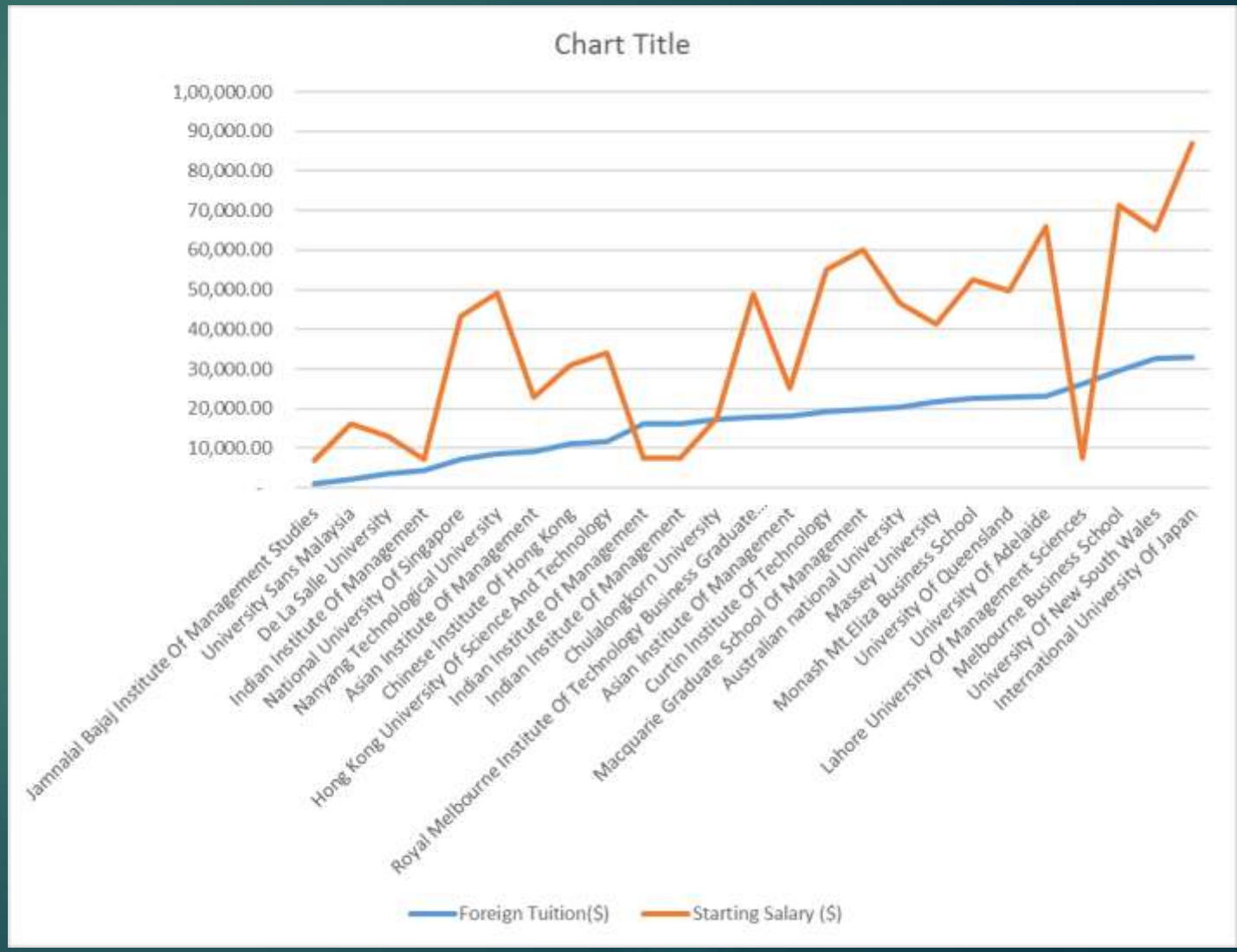
Sr, No.	School Name	Work Experience	Starting Salary ($)
1	Melbourne Business School	Yes	71400
2	University Of New South Wales	Yes	65200
3	Indian Institute Of Management	No	7100
4	Chinese Institute Of Hong Kong	No	31000
5	International University Of Japan	No	87000
6	Asian Institute Of Management	Yes	22800
7	Indian Institute Of Management	No	7500
8	National University Of Singapore	Yes	43300
9	Indian Institute Of Management	No	7400
10	Australian national University	Yes	46600
11	Nanyang Technological University	Yes	49300
12	University Of Queensland	Yes	49600
13	Hong Kong University Of Science And Technology	Yes	34000
14	Macquarie Graduate School Of Management	Yes	60100
15	Chulalongkorn University	Yes	17600
16	Monash Mt.Eliza Business School	Yes	52500
17	Asian Institute Of Management	Yes	25000
18	University Of Adelaide	Yes	66000
19	Massey University	Yes	41400
20	Royal Melbourne Institute Of Technology Business Graduate School	Yes	48900
21	Jamnalal Bajaj Institute Of Management Studies	Yes	7000
22	Curtin Institute Of Technology	Yes	55000
23	Lahore University Of Management Sciences	No	7500
24	University Sans Malaysia	Yes	16000
25	De La Salle University	Yes	13100



Required	Not Required
41305.263	24583.33

Q4 - Do starting salaries appear to be related to foreign tuition ?

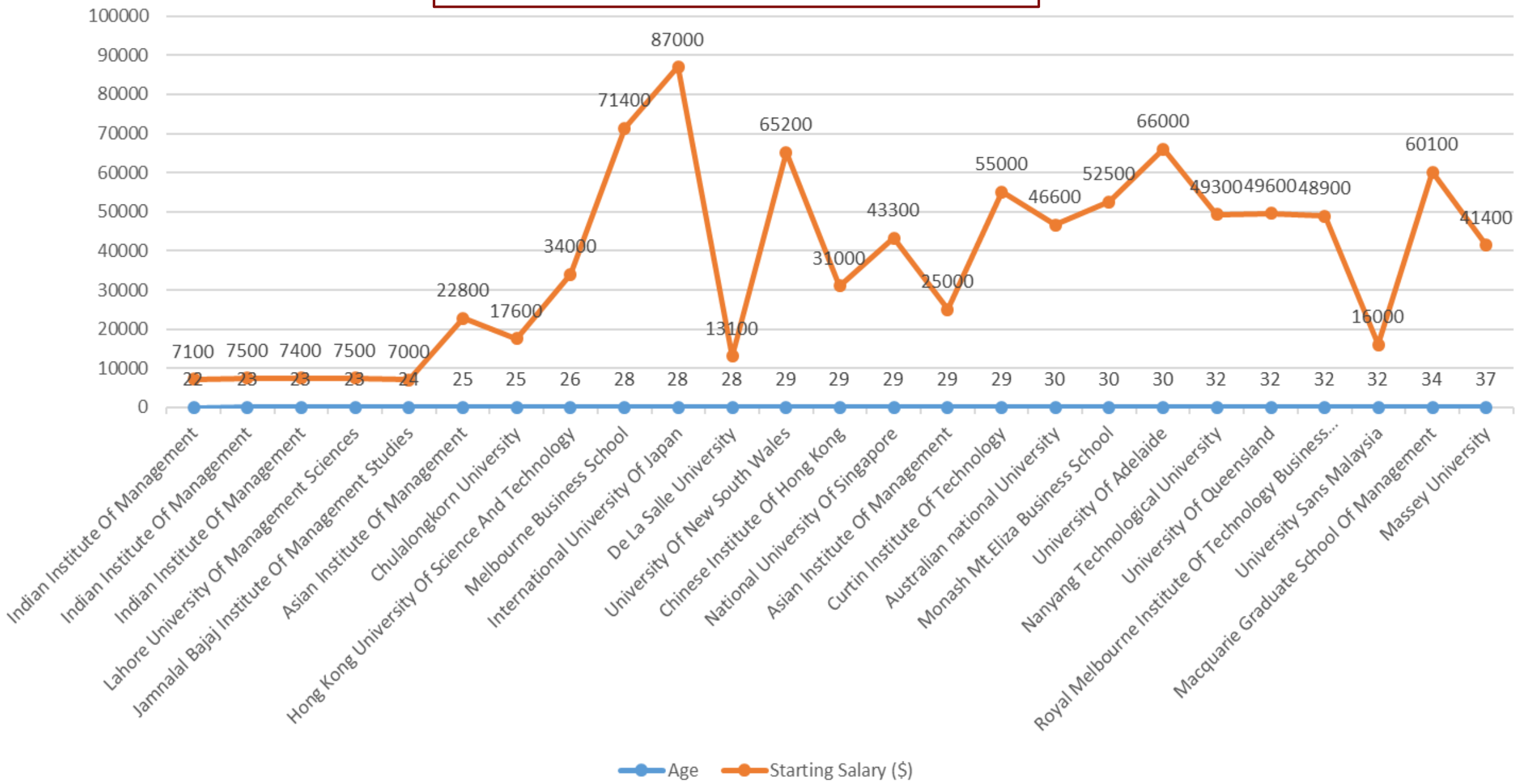
School Name	Foreign Tuition($)	Starting Salary ($)
Jamnalal Bajaj Institute Of Management Studies	1,000.00	7000
University Sans Malaysia	2,260.00	16000
De La Salle University	3,600.00	13100
Indian Institute Of Management	4,300.00	7100
National University Of Singapore	7,170.00	43300
Nanyang Technological University	8,500.00	49300
Asian Institute Of Management	9,000.00	22800
Chinese Institute Of Hong Kong	11,140.00	31000
Hong Kong University Of Science And Technology	11,513.00	34000
Indian Institute Of Management	16,000.00	7500
Indian Institute Of Management	16,000.00	7400
Chulalongkorn University	17,355.00	17600
Royal Melbourne Institute Of Technology Business Graduate School	17,765.00	48900
Asian Institute Of Management	18,200.00	25000
Curtin Institute Of Technology	19,097.00	55000
Macquarie Graduate School Of Management	19,778.00	60100
Australian national University	20,300.00	46600
Massey University	21,625.00	41400
Monash Mt.Eliza Business School	22,500.00	52500
University Of Queensland	22,800.00	49600
University Of Adelaide	23,100.00	66000
Lahore University Of Management Sciences	26,300.00	7500
Melbourne Business School	29,600.00	71400
University Of New South Wales	32,582.00	65200
International University Of Japan	33,060.00	87000



Q5 - Does the age of the students affect the starting salaries

Sr, No.	School Name	Age	Starting Salary ($)
1	Melbourne Business School	28	71400
2	University Of New South Wales	29	65200
3	Indian Institute Of Management	22	7100
4	Chinese Institute Of Hong Kong	29	31000
5	International University Of Japan	28	87000
6	Asian Institute Of Management	25	22800
7	Indian Institute Of Management	23	7500
8	National University Of Singapore	29	43300
9	Indian Institute Of Management	23	7400
10	Australian national University	30	46600
11	Nanyang Technological University	32	49300
12	University Of Queensland	32	49600
13	Hong Kong University Of Science And Technology	26	34000
14	Macquarie Graduate School Of Management	34	60100
15	Chulalongkorn University	25	17600
16	Monash Mt.Eliza Business School	30	52500
17	Asian Institute Of Management	29	25000
18	University Of Adelaide	30	66000
19	Massey University	37	41400
20	Royal Melbourne Institute Of Technology Business Graduate School	32	48900
21	Jamnalal Bajaj Institute Of Management Studies	24	7000
22	Curtin Institute Of Technology	29	55000
23	Lahore University Of Management Sciences	23	7500
24	University Sans Malaysia	32	16000
25	De La Salle University	28	13100

Comparison of Age vs Starting Salary



- The measures of dispersion can give us an idea about the reliability of the averages.
- Dispersion denotes how stretched or squeezed a distribution is.

Public Sector Banks

Bank	Number of Employees	Business Per Employee (Rs. In Lakhs)		Return of Assets (%)	
	2001-06	2005-06	2001-02	2005-06	2001-02
Allahabad Bank	18742.00	336.00	153.00	1.42	0.32
Andhra Bank	13169.00	426.75	195.96	1.38	0.97
Bank of Baroda	38737.00	396.00	222.76	0.79	0.81
Bank of India	41808.00	381.00	218.74	0.68	0.78
Bank of Maharashtra	14052.00	306.18	191.44	0.16	0.68
Canara Bank	46893.00	441.57	214.88	1.01	1.03
Central Bank of India	37241.00	240.46	148.77	0.37	0.31
Corporation Bank	10754.00	527.00	290.44	1.24	1.60
Dena Bank	10156.00	364.00	221.00	0.29	0.06
Indian Bank	21302.00	295.00	156.00	1.16	0.13

Public Sector Banks
Business Per Employee (Rs. In Lakhs)
2005-06

No. of Employees	Business Per Employee	fixi	xi-mean	(xi-mean)2	fi(xi-mean)2
18742.00	336.00	6297312.00	-31.00	961.16	18014053.74
13169.00	426.75	5619870.75	59.75	3569.75	47010101.62
38737.00	396.00	15339852.00	29.00	840.85	32572032.94
41808.00	381.00	15928848.00	14.00	195.93	8191354.47
14052.00	306.18	4302441.36	-60.82	3699.39	51983766.06
46893.00	441.57	20706542.01	74.57	5560.30	260739192.04
37241.00	240.46	8954970.86	-126.54	16013.02	596340995.82
10754.00	527.00	5667358.00	160.00	25599.18	275293540.40
10156.00	364.00	3696784.00	-3.00	9.02	91560.95
21302.00	295.00	6284090.00	-72.00	5184.37	110437465.48
252854.00		92798068.98			1400674063.52

Measures of Dispersion

Range = Maximum-Minimum = 286.54

$$\text{Coefficient of Range} = \frac{\text{Maximum-Minimum}}{\text{Maximum+Minimum}} = 0.3733$$

Measures of Dispersion

Limitation of Range and Coefficient of Range :-

- It can not be calculated for open end classes.
- It is not based on all the observations.

Measures of Dispersion

$$\text{Quartile Deviation} = \frac{Q3 - Q1}{2} = 60.285$$

$$\text{Coefficient of Quartile Deviation} = \frac{Q3 - Q1}{Q3 + Q1} = 0.082$$

Measures of Dispersion

Limitations of Quartile Deviation and Coefficient of Quartile Deviation :-

- It is not based on all observations.
- It only considers the middle 50% of the observations.

Measures of Dispersions

$$\text{Mean Deviation} = \text{MD} = \frac{\sum_{j=1}^{N} \left| X_j - \bar{X} \right|}{N}$$

= 63.068

$$\text{Coefficient of M.D. from Mean} = \frac{\text{Mean Deviation}}{\text{Mean}}$$

= 0.171

Measures of Dispersion

Limitations of Mean Deviation from Mean :-

- It does not indicate the scatter of the observations from the average values.
- It ignores the negative signs for deviations and only absolute values are considered.

Measures of Dispersions

- Standard Deviation :-

1. It takes all the observations into consideration.
2. It also takes into consideration the negative signs for deviation.

- Coefficient of Variation :-

1. It is used to know the consistency of data.

Grouped Data

$$\bar{x} = \frac{\sum f x}{\sum f}$$

$$s = \sqrt{\frac{\sum f(x - \bar{x})^2}{n}}$$

$$CV = \frac{s}{\bar{x}} \times 100$$

Mean	367.00
Std. Dev.	3.885
Coefficient of Variation	1.058

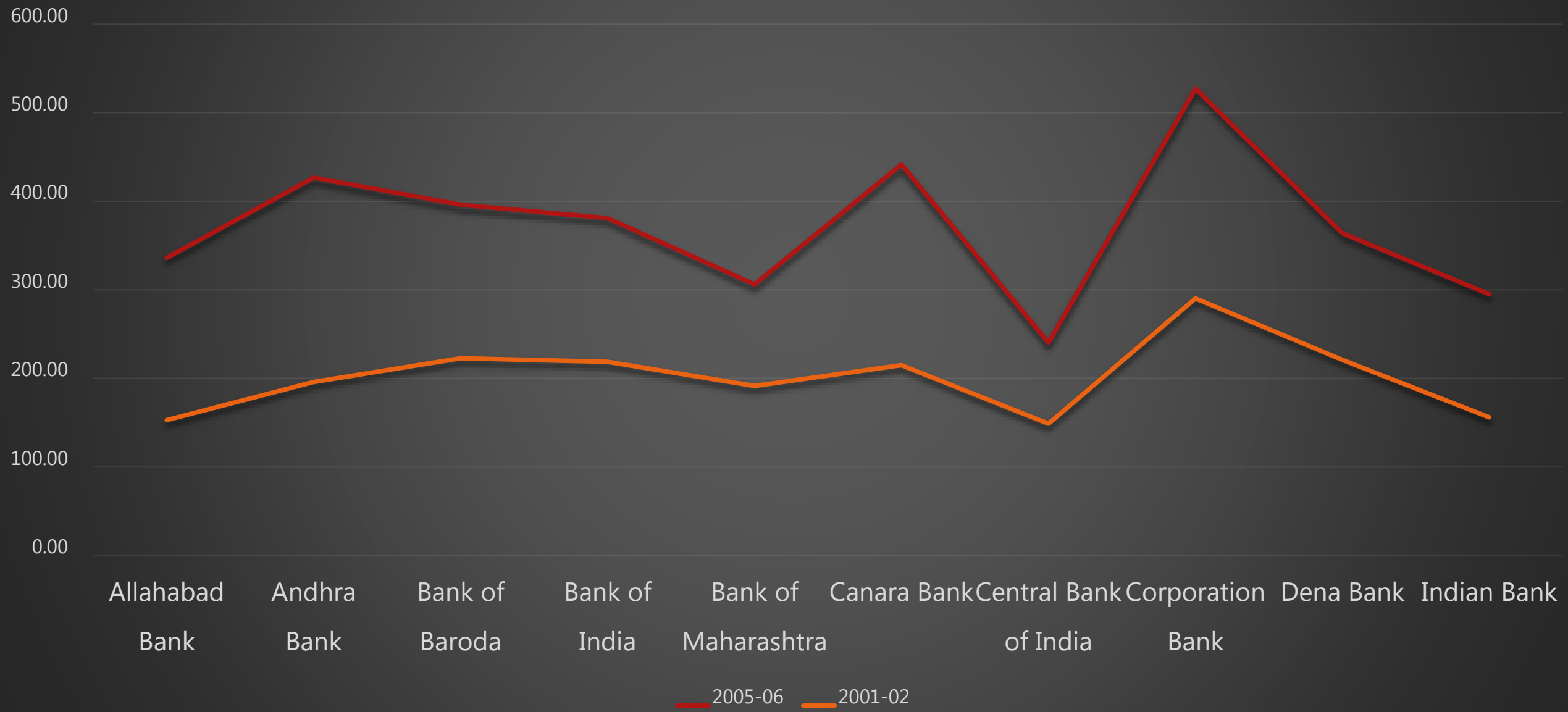
Public Sector Banks
Business Per Employee (Rs. In Lakhs)
2001-02

No. of Employees	Business Per Employee	fixi	xi-mean	(xi-mean)2	fi(xi-mean)2
18742.00	153.00	2867526.00	-45.61	2080.54	38993411.83
13169.00	195.96	2580597.24	-2.65	7.04	92681.58
38737.00	222.76	8629054.12	24.15	583.08	22586870.98
41808.00	218.74	9145081.92	20.13	405.10	16936433.16
14052.00	191.44	2690114.88	-7.17	51.45	722981.64
46893.00	214.88	10076367.84	16.27	264.62	12408762.66
37241.00	148.77	5540343.57	-49.84	2484.31	92518350.00
10754.00	290.44	3123391.76	91.83	8432.22	90680060.96
10156.00	221.00	2244476.00	22.39	501.18	5090008.49
21302.00	156.00	3323112.00	-42.61	1815.86	38681427.30
252854.00		50220065.33			318710988.58

Mean	198.61
Std. Dev.	2.519
Coefficient of Variation	1.268

Public Sector Banks

Business Per Employee (Rs. In Lakhs)



Coefficient of Variation

Business Per Employee (Rs. In Lakhs)

2005-06	1.058
2001-02	1.268

The **Coefficient of Variation** in 2005-06 is less than it was in 2001-02.

Therefore, the **Public Sector Banks** in 2005-06 are more stable in terms of the business an employee brings in than it was in 2001-02.

According to the graph the business of the banks in 2005-06 is more than it was in 2001-02.

Private Sector Banks

Bank	Number of Employees	Business Per Employee (Rs. In Lakhs)		Return of Assets (%)	
	2001-06	2005-06	2001-02	2005-06	2001-02
Bank of Rajasthan	3990.00	291.40	135.84	0.19	0.84
Bharat Overseas Bank	1098.00	484.00	269.00	0.15	1.08
Catholic Syrian Bank	2863.00	247.00	140.98	0.13	1.07
Centurion Bank of Punjab	4471.00	339.00	467.72	0.89	-3.27
City Union Bank	1605.00	339.69	203.50	1.46	1.33
Development Credit Bank	1279.00	390.00	443.00	-2.01	0.95
Dhanalakshmi Bank	1385.00	311.71	199.24	0.33	0.53
Federal Bank	6366.00	431.00	219.00	1.28	0.81
HDFC Bank	14878.00	758.00	778.00	1.38	1.48
ICICI Bank	25479.00	905.00	486.49	1.3	0.67

Private Sector Banks
Business Per Employee (Rs. In Lakhs)
2005-06

No. of Employees	Business Per Employee	fixi	xi-mean	(xi-mean)2	fi(xi-mean)2
3990.00	291.40	1162686.00	-378.36	143159.67	571207077.60
1098.00	484.00	531432.00	-185.76	34508.44	37890263.34
2863.00	247.00	707161.00	-422.76	178729.79	511703397.61
4471.00	339.00	1515669.00	-330.76	109405.13	489150342.84
1605.00	339.69	545202.45	-330.07	108949.15	174863389.95
1279.00	390.00	498810.00	-279.76	78268.16	100104971.55
1385.00	311.71	431718.35	-358.05	128203.00	177561155.13
6366.00	431.00	2743746.00	-238.76	57008.47	362915919.20
14878.00	758.00	11277524.00	88.24	7785.51	115832811.69
25479.00	905.00	23058495.00	235.24	55335.76	1409899747.62
63414.00		42472443.80			3951129076.53

Mean	669.76
Std. Dev.	9.645
Coefficient of Variation	1.44

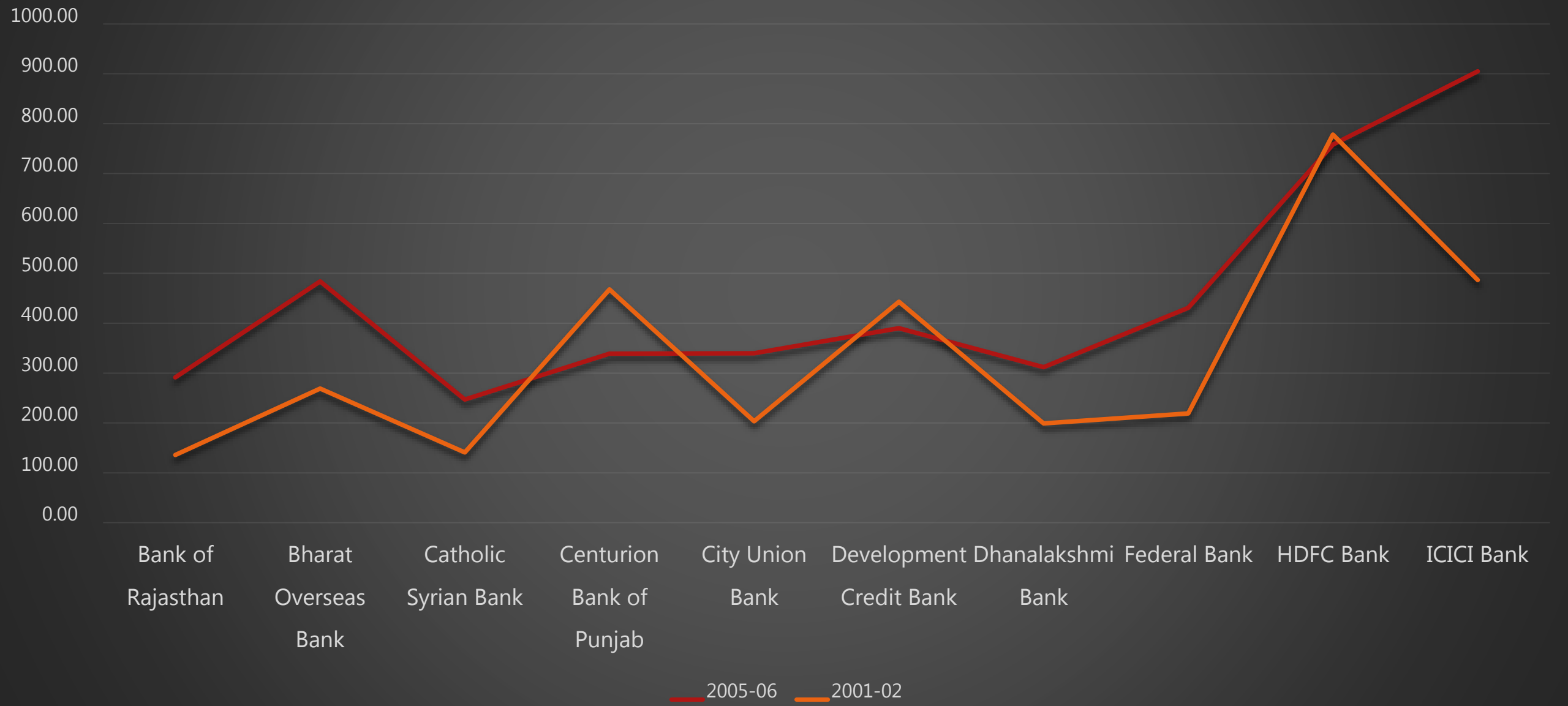
Private Sector Banks
Business Per Employee (Rs. In Lakhs)
2001-02

No. of Employees	Business Per Employee	fixi	xi-mean	(xi-mean)2	fi(xi-mean)2
3990.00	135.84	542001.60	-335.13	112309.50	448114908.34
1098.00	269.00	295362.00	-201.97	40790.30	44787754.13
2863.00	140.98	403625.74	-329.99	108890.82	311754429.57
4471.00	467.72	2091176.12	-3.25	10.54	47111.58
1605.00	203.50	326617.50	-267.47	71538.11	114818671.37
1279.00	443.00	566597.00	-27.97	782.10	1000309.20
1385.00	199.24	275947.40	-271.73	73835.07	102261574.37
6366.00	219.00	1394154.00	-251.97	63486.91	404157694.50
14878.00	778.00	11575084.00	307.03	94269.82	1402546346.87
25479.00	486.49	12395278.71	15.52	240.99	6140224.13
63414.00		29865844.07			2835629024.04

Mean	470.97
Std. Dev.	9.744
Coefficient of Deviation	2.068

Private Sector Banks

Business Per Employee(Rs. In Lakhs)



Coefficient of Variation

Business Per Employee (Rs. In Lakhs)

2005-06	1.44
2001-02	2.068

The **Coefficient of Variation** in 2005-06 is less than it was in 2001-02.

Therefore, the **Private Sector Banks** in 2005-06 are more stable in terms of the business an employee brings in than it was in 2001-02.

According to the graph the business on an average of the banks is more in 2005-06 than it was in 2001-02.

Foreign Banks

Bank	Number of Employees		Business Per Employee (Rs. In Lakhs)		Return of Assets (%)	
	2001-06		2005-06	2001-02	2005-06	2001-02
ABN Amro	3093.00		905.82	840.16	1.03	1.72
American Express Bank	1773.00		239.53	237.22	1.45	0.27
Citi Bank	3250.00		1607.92	1566.82	3.07	3.60
Deutsche Bank	678.00		1016.83	986.22	1.04	2.24
Standard Charteres Bank	5390.00		837.29	794.41	2.49	2.03

Foreign Banks
Business Per Employee (Rs. In Lakhs)
2005-06

No. of Employees	Business Per Employee	fixi	xi-mean	(xi-mean)2	fi(xi-mean)2
3093.00	905.82	2801701.26	-56.85	3232.09	9996844.82
1773.00	239.53	424686.69	-723.14	522933.55	927161185.77
3250.00	1607.92	5225740.00	645.25	416345.70	1353123513.45
678.00	1016.83	689410.74	54.16	2933.15	1988675.00
5390.00	837.29	4512993.10	-125.38	15720.51	84733532.73
14184.00		13654531.79			2377003751.77

Mean	962.67
Std. Dev.	13.194
Coefficient of Variation	1.370

Foreign Banks

Business Per Employee (Rs. In Lakhs)

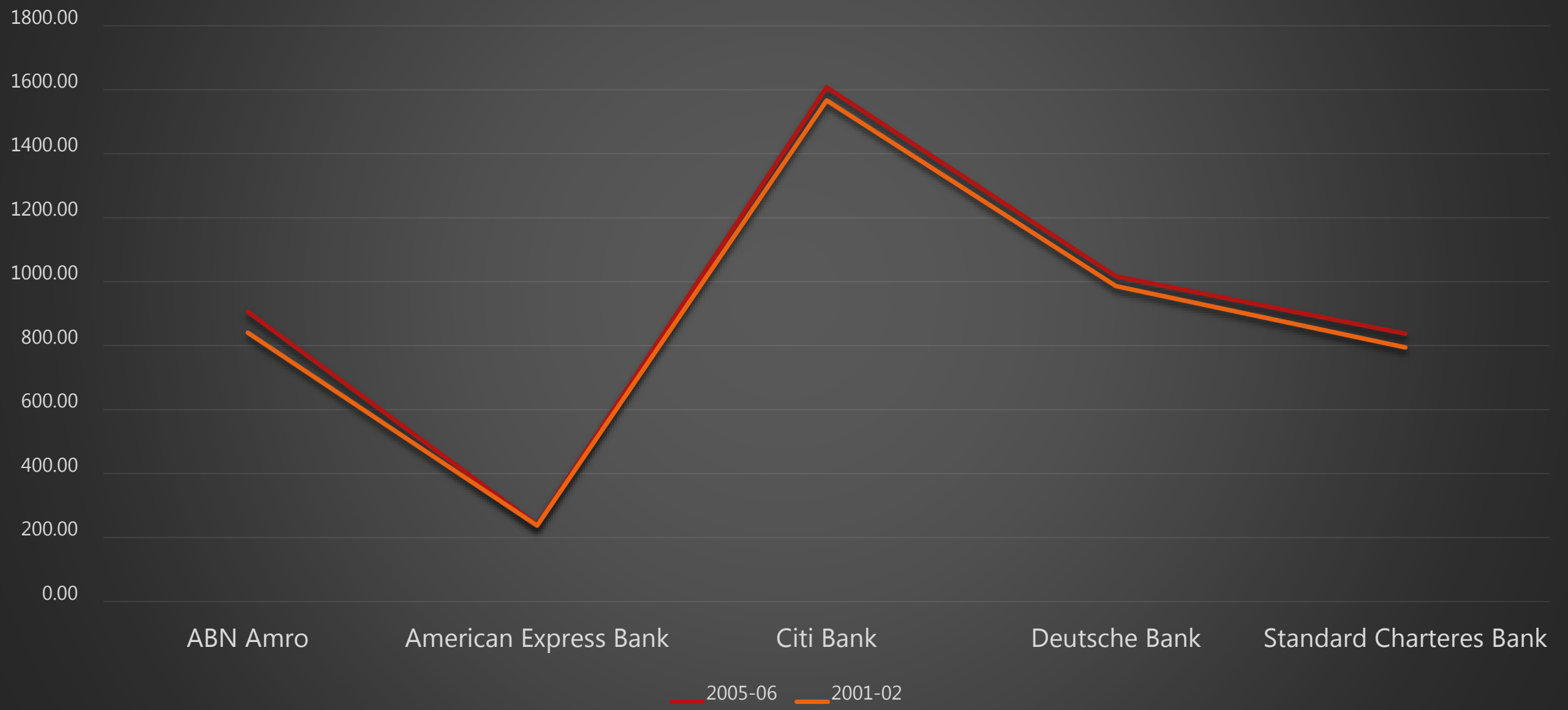
2001-02

No. of Employees	Business Per Employee	fixi	xi-mean	(xi-mean)2	fi(xi-mean)2
3093.00	840.16	2598614.88	-80.73	6517.27	20157907.86
1773.00	237.22	420591.06	-683.67	467404.11	828707493.48
3250.00	1566.82	5092165.00	645.93	417226.09	1355984790.92
678.00	986.22	668657.16	65.33	4268.06	2893746.01
5390.00	794.41	4281869.90	-126.48	15997.09	86224302.57
14184.00		13061898.00			2293968240.83

Mean	920.89
Std. Dev.	13.252
Coefficient of Variation	1.439

Foreign Banks

Business Per Employee (Rs. In Lakhs)



Coefficient of Variation

Business Per Employee (Rs. In Lakhs)

2005-06	1.370
2001-02	1.439

The **Coefficient of Variation** in 2005-06 is less than it was in 2001-02.

Therefore, the **Foreign Banks** in 2005-06 are more stable in terms of the business an employee brings in than it was in 2001-02.

According to the graph the business on an average of the banks is more in 2005-06 than it was in 2001-02.

Business Per Employee (Rs. In Lakhs)

Coefficient of Variation

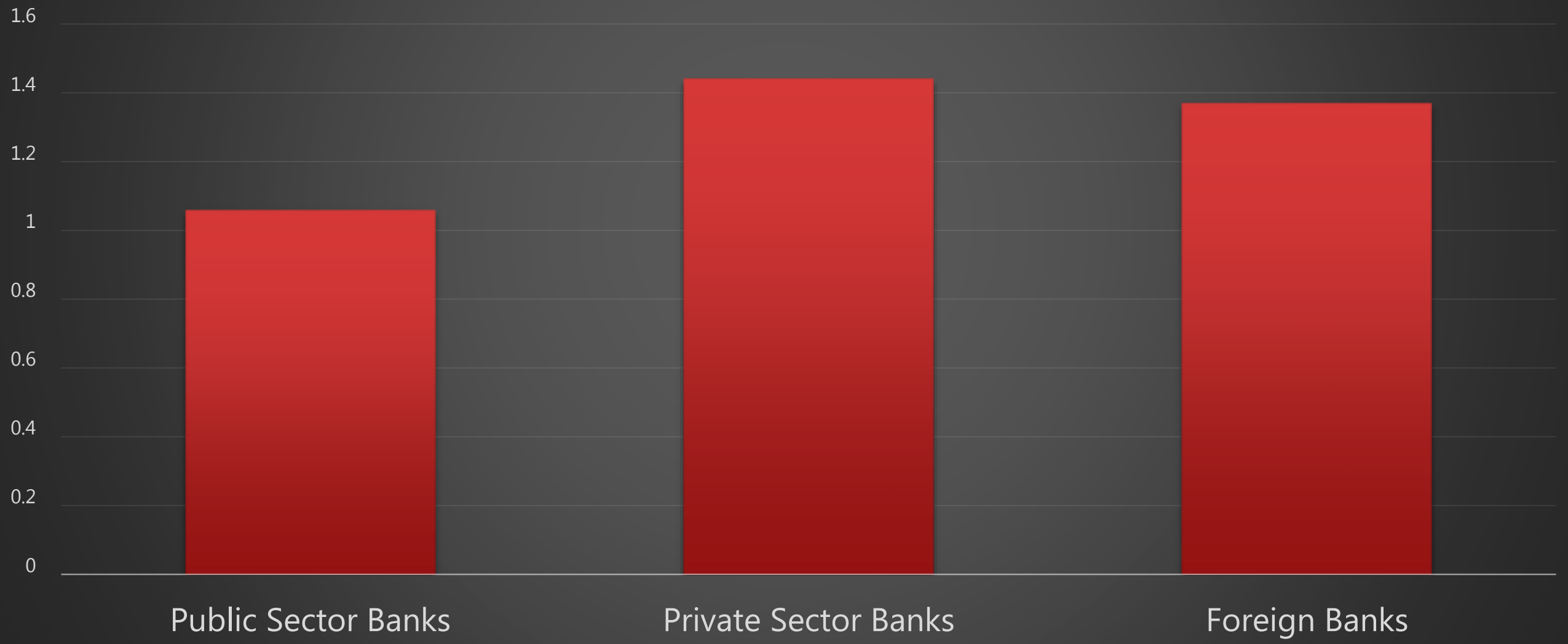
2005-06

Public Sector Banks	1.058
Private Sector Banks	1.440
Foreign Banks	1.370

Business Per Employee (Rs. In Lakhs)

Coefficient of Variation

2005-06



2005-06

The **Coefficient of Variation** for **Public Sector Banks** is less than that for Private Sector Banks or Foreign Banks.

Therefore, the **Public Sector Banks** are more stable in terms of the business an employee brings in as compared to the Private Sector Banks or Foreign Banks.

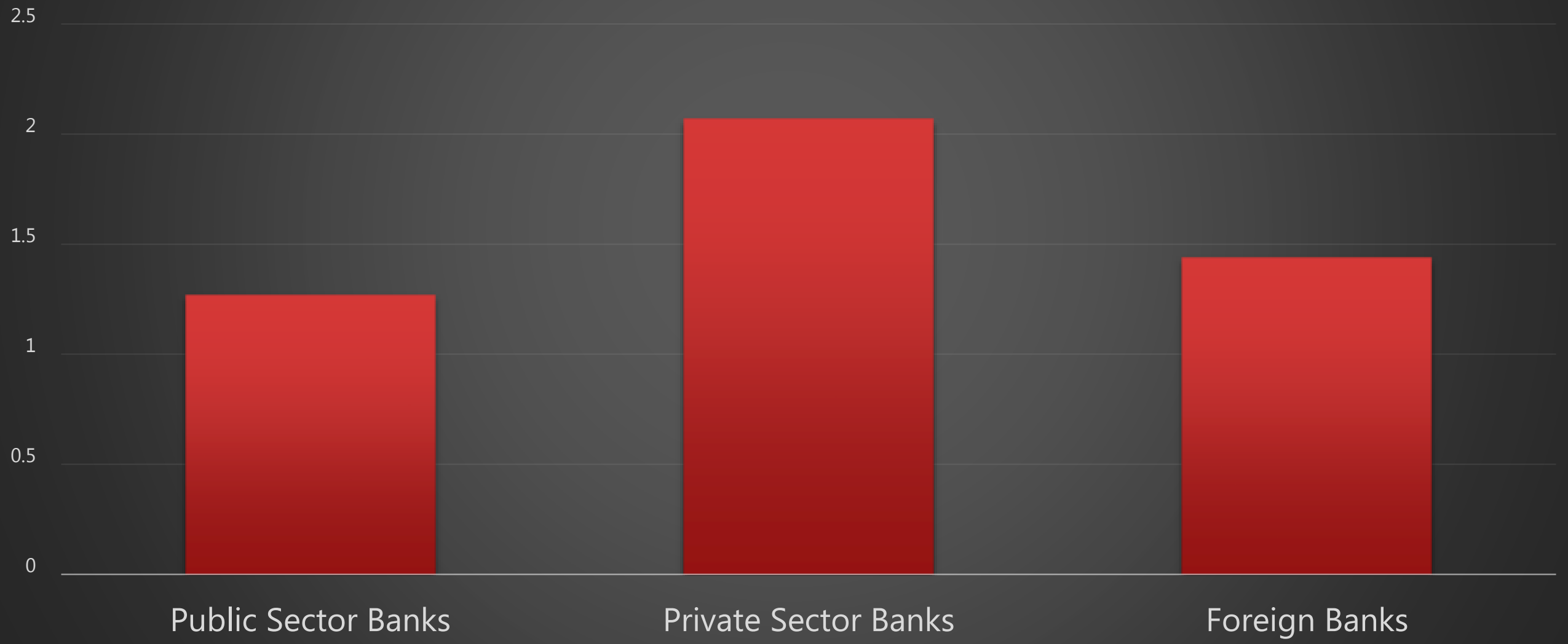
Business Per Employee (Rs. In Lakhs)
Coefficient of Variation
2001-02

Public Sector Banks	1.268
Private Sector Banks	2.068
Foreign Banks	1.439

Business Per Employee (Rs. In Lakhs)

Coefficient of Variation

2001-02



2001-02

The **Coefficient of Variation** for **Public Sector Banks** is less than that for Private Sector Banks or Foreign Banks.

Therefore, the **Public Sector Banks** are more stable in terms of the business an employee brings in as compared to the Private Sector Banks or Foreign Banks.

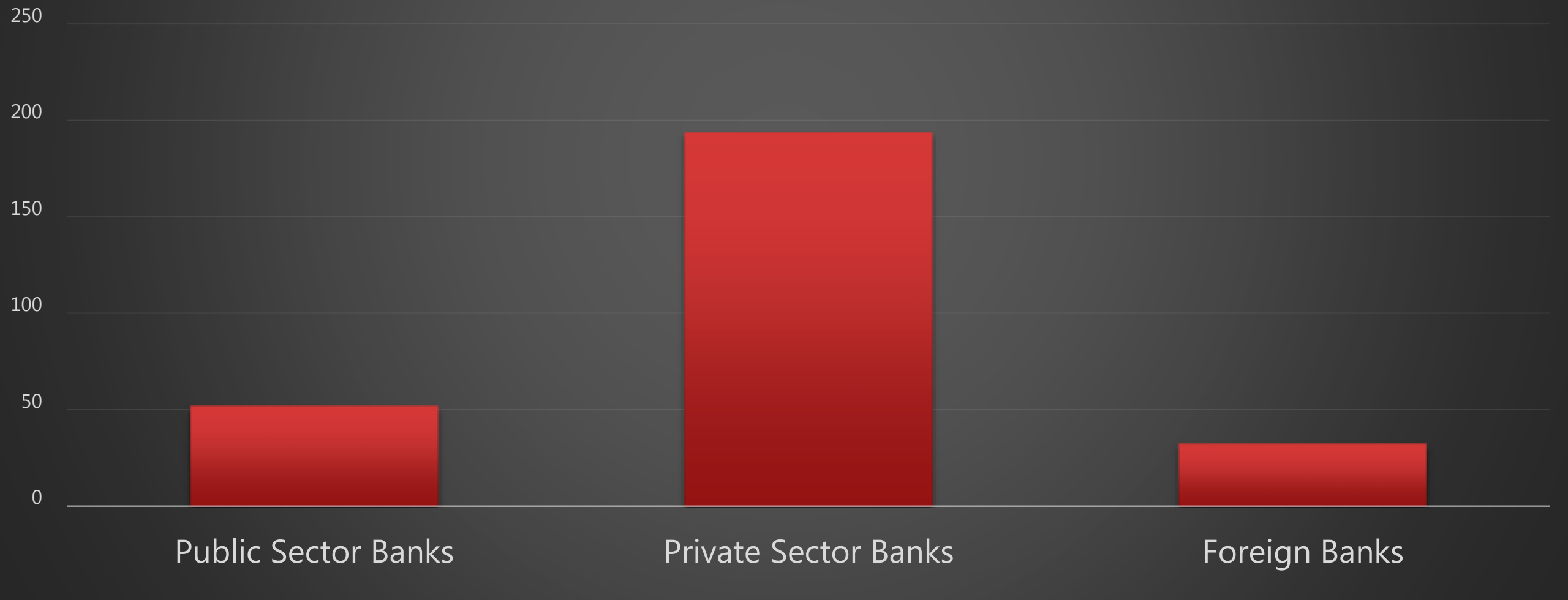
Return on Assets (%)
Coefficient of Variation
2005-06

Public Sector Banks	51.68
Private Sector Banks	193.9
Foreign Banks	32.12

Return on Assets (%)

Coefficient of Variation

2005-06



2005-06

The **Coefficient of Variation** for **Foreign Banks** is less than that for Private Sector Banks or Public Sector Banks.

Therefore, the **Foreign Banks** are more stable in terms of the percentage of Return on Assets as compared to the Private Sector Banks or Public Sector Banks.

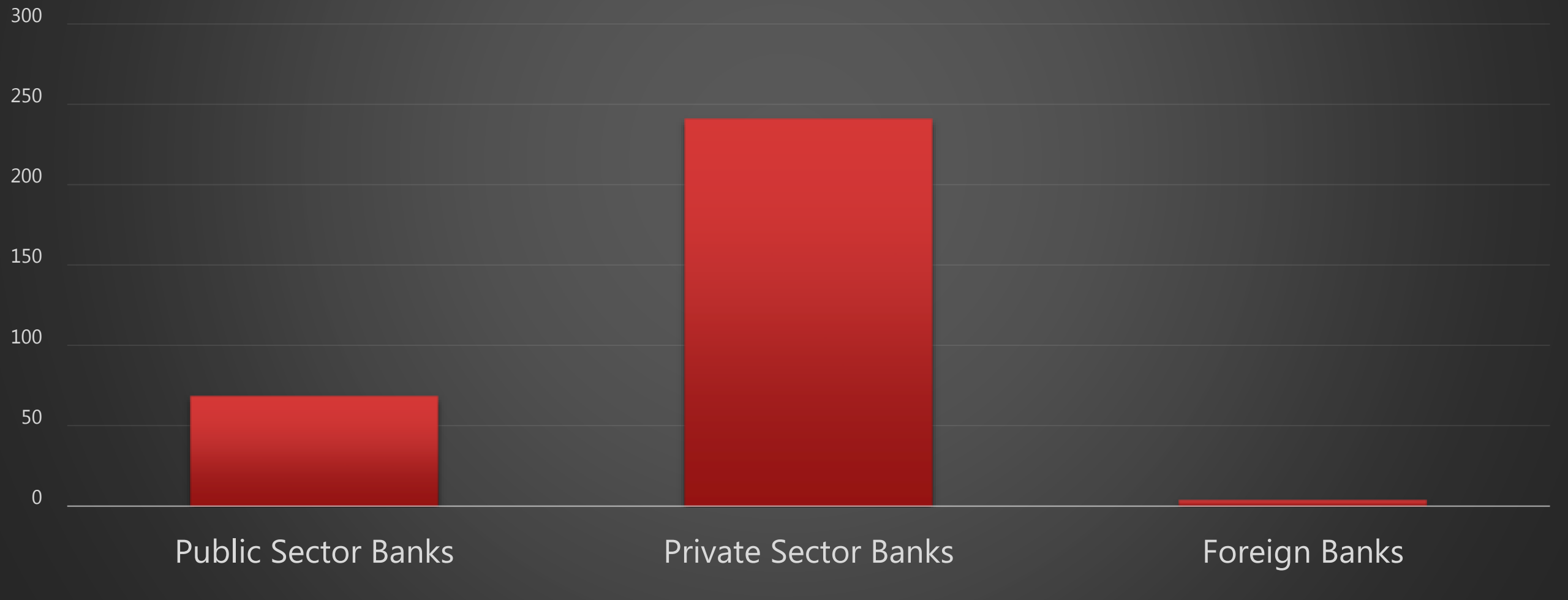
Return on Assets (%)
Coefficient of Variation
2001-02

Public Sector Banks	68.26
Private Sector Banks	241.02
Foreign Banks	38.29

Return on Assets (%)

Coefficient of Variation

2001-02



2001-02

The **Coefficient of Variation** for **Foreign Banks** is less than that for Private Sector Banks or Public Sector Banks.

Therefore, the **Foreign Banks** are more stable in terms of the percentage of Return on Assets as compared to the Private Sector Banks or Public Sector Banks.

Therefore,

- The Business Per Employee brought in is most stable for **Public Sector Banks**.
- The percentage of Return on Assets is most stable for **Foreign Banks**.

Thank You