Mean Response Time and Slowdown

1

job-size "conditioned" performance

M/M/1/FIFO

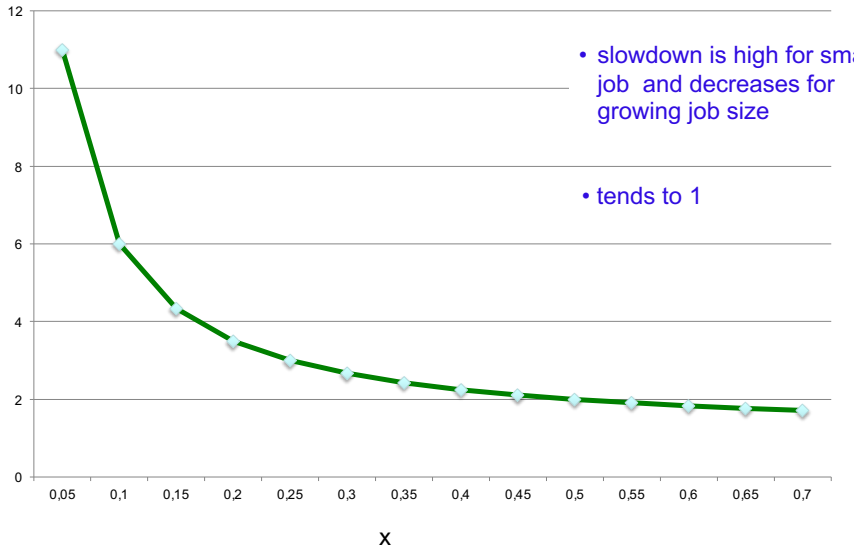
$$E(T_S(x))^{FIFO} = x + \frac{\rho E(s)}{1-\rho}$$ Mean response time for job of size x

$$E(sd(x))^{FIFO} = 1 + \frac{\rho E(s)}{x(1-\rho)}$$ Mean slowdown for job of size x

2

M/M/1/FIFO

E(sd(x)) $\rho=0.5$

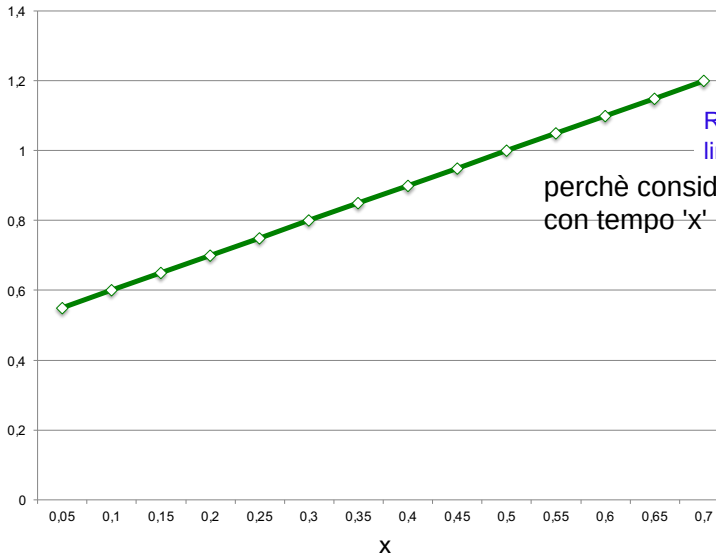


- slowdown is high for small job and decreases for growing job size
- tends to 1

3

M/M/1/FIFO

E(T_S(x)) $\rho=0.5$



Response time is linear in x

perchè considero solo jobs con tempo 'x'

4

x	E(sd(x))	E(T_S(x))	E(sd(x))	E(T_S(x))
0,05	11	0,55	41	2,05
0,1	6	0,6	21	2,1
0,15	4,333333333	0,65	14,33333333	2,15
0,2	3,5	0,7	11	2,2
0,25	3	0,75	9	2,25
0,3	2,666666667	0,8	7,666666667	2,3
0,35	2,428571429	0,85	6,714285714	2,35
0,4	2,25	0,9	6	2,4
0,45	2,111111111	0,95	5,444444444	2,45
0,5	2	1	5	2,5
0,55	1,909090909	1,05	4,636363636	2,55
0,6	1,833333333	1,1	4,333333333	2,6
0,65	1,769230769	1,15	4,076923077	2,65
0,7	1,714285714	1,2	3,857142857	2,7

E(s)=0.5

ρ=0.5

ρ=0.8

valori più alti, coda maggiormente occupata

5

job-size “conditioned” performance

M/G/1/PS per qualsiasi distribuzione

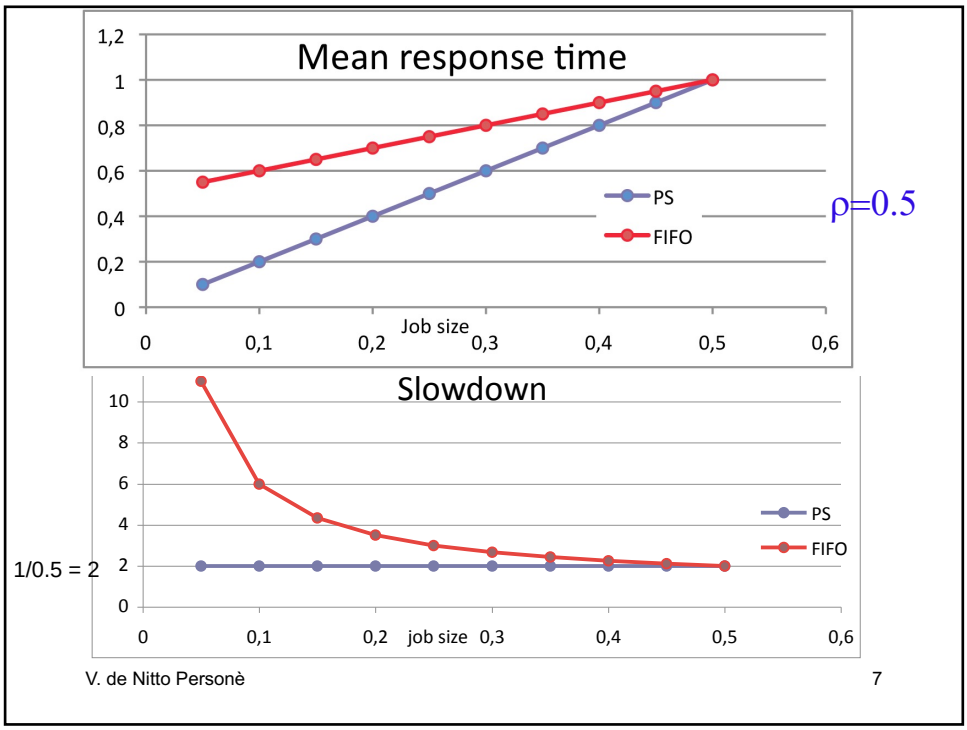
$$E(T_S(x))^{PS} = \frac{x}{1-\rho}$$

Mean response time for job of size x

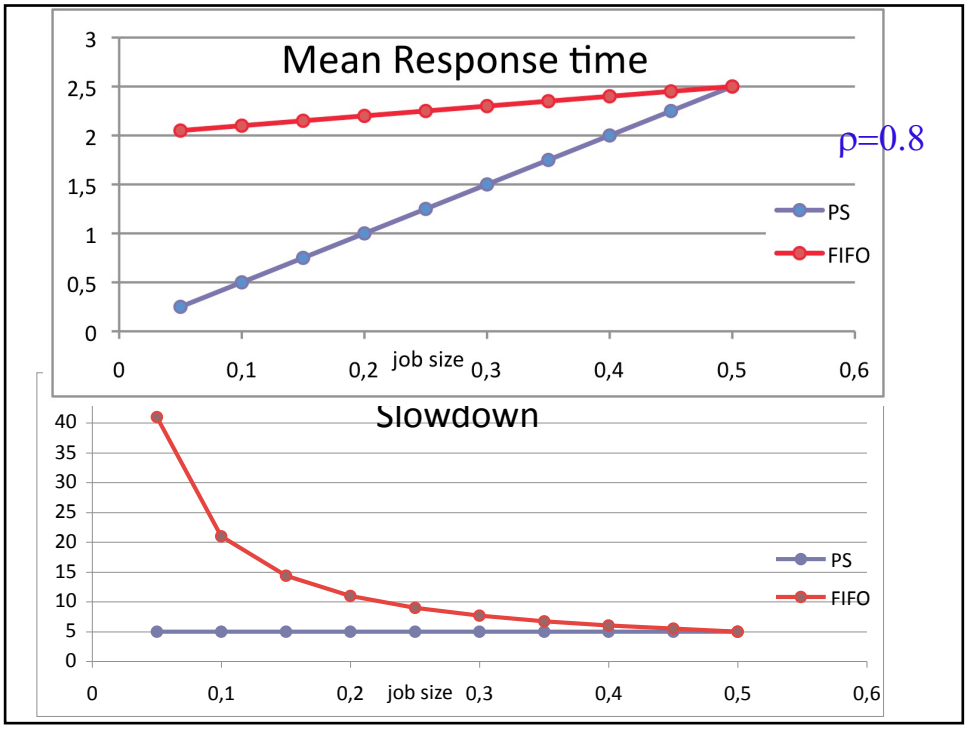
$$E(sd(x))^{PS} = \frac{1}{1-\rho}$$

Mean slowdown medio for job of size x

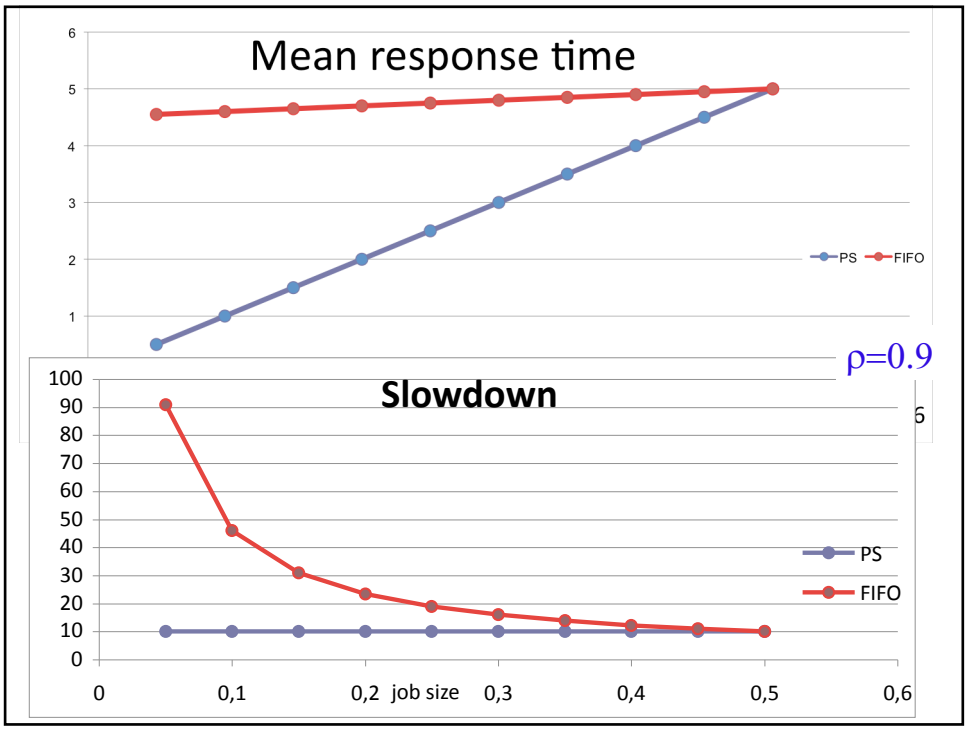
6


Mean response time
1,2
1
0,8
0,6
0,4
0,2
0
0
0,1
0,2
0,3
0,4
0,5
0,6
Job size
PS
FIFO
ρ=0.5
Slowdown
10
8
6
4
2
0
1/0.5 = 2
job size
PS
FIFO
V. de Nitto Personè
7

7


Mean Response time
3
2,5
2
1,5
1
0,5
0
0
0,1
0,2
0,3
0,4
0,5
0,6
job size
PS
FIFO
ρ=0.8
Slowdown
40
35
30
25
20
15
10
5
0
job size
PS
FIFO

8


Mean response time
6
5
4
3
2
1
PS
FIFO
ρ=0.9
Slowdown
100
90
80
70
60
50
40
30
20
10
0
PS
FIFO
0
0,1
0,2
job size
0,3
0,4
0,5
0,6

9