Chapter 5

Conclusions and Discussion

5.1 Conclusions

In Chapter 4 we took logarithms to base 10 of both the winning speeds and distances, and we fitted a linear regression model obtaining an adjusted r-squared and set of coefficients for each of the six sports. We thus have six models to use for predicting the Olympic performances in the future. These models may be described as follows.

Figure 5.1 show a graph of the year effects versus the number of Olympic Games since 1896, for the six sports. Our data start at 1928, the 8th Olympics and finish in 2000, the 24th Olympics. The curves fitted to these data are quadratic polynomials, fitted using the trend fitter in Excel's chart tool.
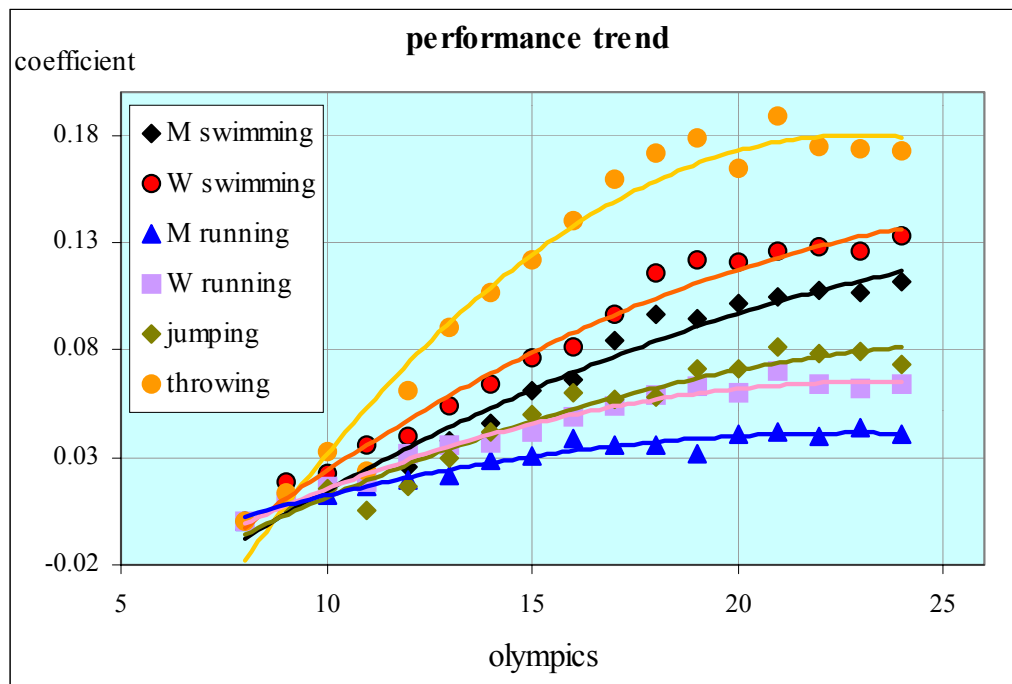

Figure 5.1: The year effects and the fitted quadratic models

We see from this graph that throwing has improved the most and men's running the least. The jumping and women's running showed approximately the same improvements in performance. The women's swimming shows the second best improvement.

It is clear from this graph that the improvements in all the sports have slowed down. In fact, man may have reached his limit of performance in running. Although women runners have improved more than men, their speeds may also be getting close to the maximum speed for which the female body is capable.

The throwing performances have also stabilized in recent years, suggesting that men and women might have reaching the limit of their ability to throw.

Jumping performances are also not improving as much as they used to. Perhaps jumpers are getting close to the maximum distances possible for the human body.

In swimming, although the increases have slowed, they are still improving. Who knows what speeds are possible?

Table 5.1 shows the percentage improvements the Olympic performances, both overall, and since 1976 when most of the curves shown in Figure 5.1 begin to flatten.. We see the result in 1928-2000 the improvement of throwing is highest (17.31%) and the women's swimming is the next highest (13.28%), and the men's running has the lowest improvement. In 1976-2000 we see the results of men's swimming is the highest (2.24%) and the women's swimming is the next highest (1.67%), while throwing has the lowest improvement (0.17%).

sport	r-square	% improve 1928-2000	% improve 1976-2000
M swimming	0.9864	11.89	2.24
W swimming	0.9848	13.28	1.67
M running	0.9910	4.05	0.43
W running	0.9775	6.37	0.50
jumping	0.9991	7.36	1.51
throwing	0.9928	17.31	0.17

Table 5.1: The improvement in Olympic performances

5.2 Discussion

We have seen substantial improvements in Olympic performances started from 1928 to the present. In men's and women's running, the improvements have been the least. It is interesting to note that the fastest time ever recorded at any Olympic Games was by Ben Johnson, who ran a time of 9.79 seconds for the 100 meters at the Olympics in Seoul in 1988, but was subsequently disqualified after testing positive for steroid drug use. And the fastest legal (i.e., not wind-assisted) time ever recorded at any Olympic Games by a woman was Florence Griffith-Joiner's 10.62 for the 100 meters at the Olympics in Seoul in 1988, and she was accused, although never found guilty, of using steroids. So there is evidence that at least in the running events, it is not possible to go any faster without artificial assistance.

In swimming, it is now well-known that steroids were used to improve performances. Coaches from East Germany have admitted that their swimmers were regularly given drugs during the 1960s. And in the 1990s Chinese swimmers tested positive to drugs, resulting in most of them being banned from the Sydney 2000 Olympics. However, while drug-taking in swimming now appears to have been eliminated due to stringent testing, swimming performances have continued to improve, and do not appear to be nearing their limits.

5.3 Limitations

The data of this study is from 4 sports in Olympics games in 1928-2000 only because the data can be compared as the objectives of the study.

The poor records of the data before 1928 are ignored because they might cause the wrong results of forecasting when the fitted quadratic model is established.

The, Microsoft Excel, software is applied to create the fitted quadratic model that would give the good forecasting for a period of time. After the curve reaches its maximum, the tendency of the quadratic curve seems to decrease.

Further study is needed to get the good forecasting results, and other analysis such as the logistic model or the spline curve may be applied for the better results. The data from other sports or the world records would also be added for more information to obtain even the right or th nearest results to the facts.