University College London

Department of Computer Science

A thesis submitted in partial fulfilment of the requirements for the degree of Master of Science in Computational Finance/Financial Risk Management, University College London

Dissertation title

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This dissertation is submitted as part requirement for the MSc ... degree at UCL. It is substantially the result of my own work except where explicitly indicated in the text.

Abstract

This LaTeX template is intended to to help you in your writing by providing a framework for your MSc dissertation. It is not intended to be prescriptive and you are welcome to change it or use a different one as long as it contains all the required elements

Acknowledgments

Write any acknowledgments that you wish to include here e.g. supervisors/family/etc. You should also include a mention of any grants, sponsorship or other funding that you have received to help you undertake your MSc course.

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1.1 Section title

This LaTeX template is intended to to help you in your writing by providing a framework for your MSc dissertation. It is not intended to be prescriptive and you are welcome to change it or use a different one. Furthermore, your academic supervisor may have their own preferences with regards to the layout and format of your dissertation, in which case you should follow their direction. In any event, your dissertation should have a neat and professional appearance and include the following elements in addition to the core content:

1. Title
2. Student name
3. Academic supervisor name
4. Industrial supervisor name (if applicable)
5. Disclaimer
6. Table of contents
7. List of figures
8. List of tables
9. Bibliography

In this template I have included a few examples of LaTeX commands, but for more details there are numerous resources online. For those of you who prefer print, a useful book is Lamport (1994).

1.1.1 Subsection title

1.1.1.1 Subsubsection title

Example of a figure:

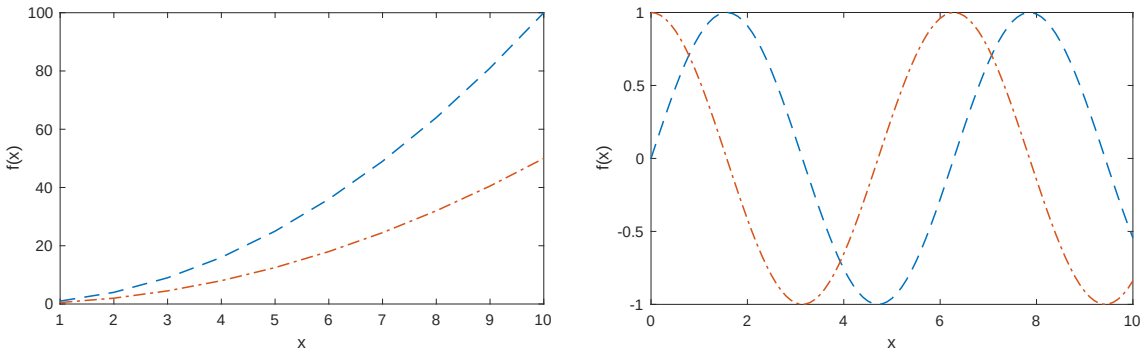

Figure 1.1: It is good practice to put a long descriptive title in your caption so that readers can immediately understand the significance of the figure without having to search through the accompanying text. The short title in square brackets before the long caption is for the more concise description included in the List of figures.

The use of "\FloatBarrier" allows you to specify that floats (e.g. Figures and Tables) should not appear past a certain point in a document but you must import the "placeins" package in order to use it.

Example of a table:

	Process parameters		
Process	$\Psi(\xi, t)$	Symbol	Value
Gaussian	$e^{\left(i\mu\xi - \frac{1}{2}\sigma^2\xi^2\right)t}$	μ	0
		σ	0.4
Variance gamma	$\left(1 - i\nu\xi\theta + \frac{1}{2}\nu\sigma^2\xi^2\right)^{-\frac{t}{\nu}}$	θ	$\frac{1}{9}$
		σ	$\frac{1}{3\sqrt{3}}$
		ν	0.25
Merton jump-diffusion	$e^{\left(-\frac{1}{2}\sigma^2\xi^2 + \lambda(e^{i\mu_J\xi - \frac{1}{2}\sigma_J^2\xi^2} - 1)\right)t}$	σ	0.1
		λ	3
		μ_J	-0.05
		σ_J	0.086

Table 1.1: This is an example table, you end a column entry using & and a row entry with the usual double backslash. Notice that you can use in text formulas surrounded by the usual $$. You can also merge columns and rows using the multicolumn and multirow commands but you must import the multirow package to do this.

In order to include formulas, you can use in line equations by using $ at the beginning and end, for example $y = f(x)$ and single line equations using the "equation" environment,

for example

$$f(x) = \frac{1}{2\pi} \int_{-\infty}^{+\infty} e^{-ix\xi} \widehat{f}(\xi) d\xi. \tag{1.1}$$

You can also write equations on several lines using the "align" environment, notice the use of & at the point where the lines align and the double backslash to move to the next line, for example

$$\begin{aligned} f(x) &= \frac{1}{2\pi} \int_{-\infty}^{+\infty} e^{-ix\xi} \widehat{f}(\xi) d\xi \\ &= \frac{1}{2\pi} \int_{-\infty}^{+\infty} e^{-ix\eta} \widehat{f}(\eta) d\eta. \end{aligned} \tag{1.2}$$

Notice the use of "\nonumber" above to suppress the equation numbering on the first line.

You can also use the "\label{}" "\ref{}" commands to reference items in the dissertation such as Section 1.1, Figure 1.1, Table 1.1 and Eq. (1.2).

You must also include a bibliography so that you can reference your background reading. This should include papers, for example Fusai et al. (2016), books, for example Press et al. (2007), and websites, for example Wang (2014).

Write your bibliography as a .bib file (an example is included) and then import using the "\bibliography{}" command.

Bibliography

Fusai, G., G. Germano, D. Marazzina. 2016. Spitzer identity, Wiener-Hopf factorisation and pricing of discretely monitored exotic options. *European Journal of Operational Research* **251**(4) 124–134. doi:10.1016/j.ejor.2015.11.027.

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Press, W. H., S. A. Teukolsky, W. T. Vetterling, B. P. Flannery. 2007. *Numerical Recipes in C++*. 3rd ed. Cambridge University Press, Cambridge.

Wang, R. 2014. Conformal mapping between s-plane to z-plane. `http://fourier.eng.hmc.edu/e102/lectures/Z_Transform/node2.html`. URL `http://fourier.eng.hmc.edu/e102/lectures/Z_Transform/node2.html`. Accessed: 09/10/2015.

Appendix A

Title of first appendix

A.1 Code listing

If you wish to list code in your appendices, one way is to use the "verbatim" environment.

```
% Left hand side plot
figure
plot(1:10,(1:10).^2,'--',1:10,((1:10).^2)/2,'-.','Linewidth',1)
xlabel('x')
ylabel('f(x)')
% Right hand side plot
figure
plot(0:0.1:10,sin(0:0.1:10),'--',0:0.1:10,cos(0:0.1:10),'-.','Linewidth',1)
xlabel('x')
ylabel('f(x)')
```