

WILMOTT

RESEARCH REPORT

SERVING THE QUANTITATIVE FINANCE COMMUNITY

Newsletter for
www.wilmott.com
registrants

INSIDE THIS ISSUE:

<i>Editorial</i>	1
<i>Technical Article</i>	2
<i>Patrons</i>	4
<i>Forum</i>	7
<i>Bookshop</i>	10
<i>Special Offer</i>	12
<i>Appointments</i>	13
<i>Careers</i>	17

EDITORIAL

Moving into the second quarter of the year, and although we might not be so bold as to say there is optimism in the air, we do note that there is something positive going on. After the first three months of this year, which have pretty much been a frenetic exercise in cleaning up last year's mess from 911 through Enron, it seems that banks, companies and institutions are finally setting their eyes fully on the future, new goals set, and sidelined projects once again given priority.

This positive tendency is particularly indicated by recent movements in the Quantitative Finance job market, with demand for candidates starting to take off. Although certain barriers mean there isn't as much fluidity as say 18 months ago (for example, some European hirers' unwillingness to hire non-EU candidates) all indications point to a

Wilmott - Serving The Quantitative Finance Community

Wilmott is the leading online service for the Quantitative Finance Community. Through a combination of quality content, high-level peer-to-peer discussion, and an open inclusive approach to the industry, the service has in a very short time established itself as the place for practitioners and academics to develop ideas, discuss current trends and seek advice of one another.

Community is at the heart of everything Wilmott strives to succeed in. When the project was started, the idea that there was a tangible, global community of Quantitative Finance practitioners out there was accepted but viewed as a challenging one to bring together. Certain core beliefs have provided the motivation behind bringing this community together in an effective manner.

We publish technical papers immediately, rather than leaving it to a committee of pundits to decide on a work's merit, we believe the qualified community, those who will put theory into practice, have the most to say – and therefore the

25TH MARCH 2002

busy period ahead for people interested in making the next big move.

Much of this can be detected in the quality and frequency of new positions on our Jobs Board – which we have noted has given many of you impetus to post careers related questions on the Forum. Well, the volume of those posts has led us to launch a new section in Forums related to careers. With so many hirers, recruiters and job-seekers floating around Wilmott, and with so many experienced practitioners ready to offer their experience, it was a foregone conclusion that we'd be doing something of this nature. And for as long as its justified in staying up there, we'll take it as an indicator that things out in the market are indeed getting better.

Dan Tudball

most to offer in developing new approaches. Let the market decide.

We believe in open discussion, and we believe any interested party, of whatever technical ability should be able to ask appropriate people for their insight. We provide the most effective forum of its kind anywhere on the net where students mingle with hot shots and industry veterans. We lower barriers to entry.

We bring new applications of new theory to the community's attention. We provide developers and users the ability to interact in a neutral environment, providing the kind of information that leads to better, more creative and more functional tools for the Quantitative Finance market. We champion originality and those who harness creativity along with technical excellence.

We are dedicated to the continuing growth of this community that we serve, through publication, education and, above all, interaction.

For further information please contact
paul@wilmott.com or dan@wilmott.com

ITO33

We don't know **everything** about
volatility...yet...but we know enough to make the
best **Convertibles** software on the market

WWW.WILMOTT.COM TECHNICAL ARTICLE

CHOOSING MORE ACCURATE BINOMIAL TREE PARAMETERS FOR VALUING EQUITY OPTIONS

Mike Staunton

Why you should use the LR binomial parameters

There seems little point in beating about the bush – it’s easy to improve the accuracy of the standard binomial models for valuing equity options and yet very few people know how. So banish your Cox, Ross & Rubinstein (or Jarrow & Rudd) models and replace them with the Leisen & Reimer model – just paste the accompanying VBA functions into a new module sheet.

Most academics when teaching options rely on the assertion that, merely by increasing the number of steps used in a binomial model, accuracy improves. What they omit to mention is that, apart from the special case when the strike price is equal to the current share price, both the CRR and JR binomial models do not converge uniformly but instead oscillate.

Steps	Time	JR error	CRR error	LR error
9	1	-1.03%	0.80%	-0.0283%
20	1	0.61%	0.68%	-0.0057%
29	1	0.35%	-0.46%	-0.0031%
40	2	-0.23%	0.37%	-0.0016%
49	1	0.31%	-0.05%	-0.0011%
60	1	0.00%	0.18%	-0.0007%
69	1	0.12%	0.10%	-0.0006%
80	1	0.15%	0.06%	-0.0004%
89	1	-0.06%	0.13%	-0.0004%
100	2	0.15%	-0.04%	-0.0003%
199	4	0.07%	0.04%	-0.0001%
300	7	0.05%	0.05%	-0.0001%
399	11	0.04%	0.02%	-0.0001%
500	17	0.02%	-0.03%	0.0000%
599	23	0.00%	0.02%	0.0000%
700	32	-0.01%	0.02%	0.0000%
799	41	0.01%	-0.02%	0.0000%
900	50	0.02%	0.01%	0.0000%
999	62	0.01%	0.01%	0.0000%

The above table shows both the time taken (in

milliseconds on my pc, where the BS value takes 1 millisecond) and percentage error when using the exact binomial option pricing formula to value a European call option using three different choices of binomial parameters. It is clear that as we increase the number of binomial steps, the sign of the error with both the JR and CRR parameters changes.

In contrast, the LR choice of parameters remove the oscillation and even more importantly reduce the size of the absolute error to relatively tiny levels, with even as few as 50 steps.

Where does the accuracy of the LR tree come from?

The LR tree has separate approximations for each of N(d1) and N(d2) terms, whereas traditional trees jointly approximate N(d1) and N(d2).

Why is there no oscillation with the LR tree?

The option values from the LR tree do not oscillate because the tree is centred on the exercise price. On the other hand, with traditional trees the addition of a single step can switch one of the end nodes from being out-of-the money to in-the-money and this changes the sign of the error.

The VBA Code

The Option Explicit line forces you to declare all variables (apart from input parameters) using Dim statements, while the Option Base 1 line ensures that VBA arrays are numbered starting from 1 (to conform with Excel). The Dim statement declares the variables with the default Variant type. The VBA functions, Sqr, Log and Exp, must be used in place of their Excel equivalents. Excel functions are used with the preface Application. (alternatively the newer WorksheetFunction. preface will do). Once written, the function can be called from the Function Wizard (in the User Defined category) just like any ordinary Excel functions. The first function, BinTreeParamVec, returns a vector with the necessary parameters (for multiplicative up and down moves and associated up probability) for each of the three models. The

“both the CRR and JR binomial models do not converge uniformly but instead oscillate”

WWW.WILMOTT.COM TECHNICAL ARTICLE

LR parameters require the `PPNormInv` function that returns the binomial approximation to the normal distribution. The second function, `BinEuroOptionValue`, uses the exact European call option pricing formula from Cox & Rubinstein, adapted here to allow for a continuous dividend yield. Notice that due to the limitations of the `BinomDist` function in Excel, my function

is limited to having fewer than 1025 steps.

Reference

The Leisen & Reimer paper “Binomial Models for Option Valuation – Examining and Improving Convergence” is somewhat technical but those brave souls might wish to track it down in volume 3 (1996) of *Applied Mathematical Finance*, pages 319-346.

```
Option Explicit
Option Base 1
```

```
Function BinTreeParamVec(imod, S, X, r, q, tyr, sigma, nstep)
' Returns Vector of Binomial Tree Parameters (imod=0 for JR, 1 for CRR, 2 for LR)
' Returns as row vector with u, d then p
' Uses BSDTwo fn
' Uses PPNormInv fn
Dim deltax, nu, erm, rnm, u, d, p, d2, pdash
If imod = 2 Then nstep = Application.Odd(nstep)
deltax = tyr / nstep
nu = (r - q - 0.5 * sigma ^ 2)
erm = Exp((r - q) * deltax)
If imod = 0 Then
    u = Exp(nu * deltax + sigma * Sqr(deltax))
    d = Exp(nu * deltax - sigma * Sqr(deltax))
    p = 0.5
ElseIf imod = 1 Then
    u = Exp(sigma * Sqr(deltax))
    d = 1 / u
    p = 0.5 + (nu * Sqr(deltax)) / (2 * sigma)
Else
    d2 = BSDTwo(S, X, r, q, tyr, sigma)
    p = PPNormInv(d2, nstep)
    pdash = PPNormInv(d2 + sigma * Sqr(tyr), nstep)
    u = erm * pdash / p
    d = erm * (1 - pdash) / (1 - p)
End If
BinTreeParamVec = Array(u, d, p)
End Function
```

```
Function BinEuroOptionValue(imod, iopt, S, X, r, q, tyr, sigma, nstep)
' Returns Binomial European Option Value (imod=0 for JR, 1 for CRR, 2 for LR)
' Uses BinTreeParamVec fn
Dim u, d, p, pdash, a, bind1, bind2, v
Dim udv As Variant
If imod = 2 Then nstep = Application.Odd(nstep)
If S > 0 And X > 0 And tyr > 0 And sigma > 0 And nstep < 1025 Then
    udv = BinTreeParamVec(imod, S, X, r, q, tyr, sigma, nstep)
    u = udv(1)
    d = udv(2)
    p = udv(3)
    pdash = p * u / Exp((r - q) * tyr / nstep)
    a = Application.Max(0, 1 + Int(Log(X / (S * d ^ nstep)) / Log(u / d)))
    bind1 = 1 - Application.BinomDist(a - 1, nstep, pdash, True)
    bind2 = 1 - Application.BinomDist(a - 1, nstep, p, True)
    If a <= nstep Then
        v = S * Exp(-q * tyr) * bind1 - X * Exp(-r * tyr) * bind2
        If iopt = -1 Then v = v - S * Exp(-q * tyr) + X * Exp(-r * tyr)
    Else
        v = 0
    End If
Else
    v = -1
End If
BinEuroOptionValue = v
End Function
```

```
Function PPNormInv(z, n)
' Returns the Peizer-Pratt Inversion
' Only defined for n odd
' Used in LR Binomial Option Valuation
Dim c1
n = Application.Odd(n)
c1 = Exp(-((z / (n + 1 / 3 + 0.1 / (n + 1))) ^ 2) * (n + 1 / 6))
PPNormInv = 0.5 + Sgn(z) * Sqr((0.25 * (1 - c1)))
End Function
```

```
Function BSDTwo(S, X, r, q, tyr, sigma)
' Returns the Black-Scholes d2 value
BSDTwo = (Log(S / X) + (r - q - 0.5 * sigma ^ 2) * tyr) / (sigma * Sqr(tyr))
End Function
```

DEAR READER, HERE IS YOUR TO-DO LIST...

In less than two months the wilmott.com website has become the preferred meeting place for the quantitative finance community via the Forums, and the source for quality research material, reaching you hot off the press.

We have cutting-edge research material on the site and educational tutorials. Some of the best researchers in this business are regularly supplying us with their research in advance of any other publication. We publish better, more, and faster than just about anywhere else.

For this service to be free of charge to the end-users we require our readers to do us a little favor every now and then. Don't worry, it's nothing too time consuming, won't require much effort and will not cost you anything. All you have to do is visit the websites of our sponsors and take a serious look at the services or products they offer. If you do then decide to buy, just mention wilmott.com. Now, that wasn't too painful, was it?

To-do list:

- Visit our sponsors' websites
- Check out their services
- If you like what you see, give them a call
- Mention wilmott.com

Details of our Patronage program may be found on wilmott.com, and further details may be obtained from patrons@wilmott.com.

"For this service to be free of charge to the end-users we require our readers to do us a little favor every now and then"

WILMOTT.COM PATRONS

ITO33

We don't know **everything** about **volatility...yet...but we know enough to make the best Convertibles software on the market**

With derivative instruments becoming more and more complex, and the need to price them accurately and quickly more and more urgent (VaR simulation, on-line pricing, etc.), the opportunity emerged for talent and competence specifically concentrated on the mathematical pricing problems, while the extant financial software companies would take care of the traditional interfacing, integrating and customising issues.

ITO 33 is an engineering company which specialises in the development of highly efficient numerical solvers for use in the applied financial field, mainly the pricing and simulation of derivative instruments. Its staff is unique in that it combines the experience of an option trader, and a fixed income/emerging market trader, both of whom have led long and successful careers, in London, New York and Paris, the knowledge and expertise of three PhDs in applied mathematics and computer science, and the authority of a PhD in Finance.

ITO33 - 39, rue Lhomond
75005 Paris - France
tel.: 01 47 07 08 12
fax: 01 47 07 87 95
mail: info@ito33.com

For your demo copy of ITO33's FREEBOUND for Convertible Bonds and FREEWAY for American contracts just email **paul@wilmott.com**.

FREE...

After some arm twisting, Elie Ayache of ITO33 has agreed to let us distribute, **free of charge**, the demo version of their very sophisticated **convertible bond software**. Now this *is* a shameless plug, but we haven't seen anything as flexible or as imaginative as this on the market before. For your copy just email **paul@wilmott.com**.

WILMOTT.COM PATRONS CONT'D

WILMOTT ASSOCIATES

Financial Training

N2 is here. Investment banks must now ensure that their employees are kept up to date with models and methodologies, that everyone must have a basic knowledge of products and techniques. Employee competence must not only be maintained but also advanced in line with the market as a whole.

For a decade Wilmott has been one of the leading names in the education and training of bank personnel. Whether you require training in old products or new, in basic quantitative modelling or the latest techniques, Wilmott can deliver quickly and economically.



In response to N2, Wilmott Associates have geared up to deliver training courses in a format that meets the needs of the marketplace, with a flexibility and speed of response unmatched by other firms.

Short and straight-to-the-point training, in house, and at times most convenient to you, whether that be morning, afternoon or evening, given by experienced trainers with practitioner and consultant backgrounds.

Contact Andrea Estrella to arrange a consultation now, andrea@paulwilmott.com

“For a decade Wilmott has been one of the leading names in the education and training of bank personnel”



The **British-Russian Offshore Development Agency (BRODA)** is a British company specializing in the development and marketing of advanced modeling tools. Through alliances with professionals from the Former Soviet Union BRODA brings extensive mathematical expertise and cutting edge scientific skills of the Former Soviet Union to the West.

STOP PRESS: The British-Russian Offshore Development Agency (Broda) has implemented Sobol' sequence pseudo-random generation software up to and including dimension 370. Russian mathematical guru, Ilya Sobol' pioneered this sequence and modified direction numbers for it. Broda chief co-ordinator Sergei Kucherenko described Sobol' as: “A theorist who has always worked very closely with practitioners from the 1960s onwards and has been involved with many big projects - he has made incredible contributions to the field of applied quantitative mathematics.” The pseudo-random numbers involved are used for pricing derivatives and for value at risk in the form of highly efficient high-dimensional Monte Carlo simulations. This latest development from Broda has been described by the organisation as evidence of their support for all areas of information systems. In an official statement it said: “This is further evidence of us bring Russian mathematical expertise and scientific skills to the West.”

Download the Sobol' software free of charge from www.broda.co.uk

“The British-Russian Offshore Development Agency (Broda) has implemented Sobol' sequence pseudo-random generation software up to and including dimension 370”

WILMOTT.COM PATRONS CONT'D



The **Investment Analytics Volatility Report** identifies buying and selling opportunities in equity options markets using advanced mathematical models

researched and developed by its team of quantitative analysts. Our proprietary volatility index and stochastic volatility models measure underlying volatility and model its behavior more accurately and efficiently than traditional methods. Using these models we are able to correctly anticipate the future direction of volatility an average of 75% of the time in the universe of stocks and equity indices we analyze, and identify regimes of unsustainably high or low levels of volatility with a high degree of accuracy. Our stochastic option pricing models apply these factors to detect options that are trading rich or cheap relative to fair value. Together these techniques enable us to select investment opportunities that offer the greatest risk-reward trade-off, generating specific buy or sell recommendations in selected stock and index options that are consistently profitable. Our proprietary asset allocation methodology combines the volatility analytics with elements of portfolio optimization and risk management theory to create optimal portfolios capable of generating consistent, high returns, with minimal drawdown, even at times of high market stress and regardless of the direction of the overall market.

Visit www.volatility-report.com for more information
 Contact Jonathon Kinlay
 Email: info@volatility-report.com
 Phone: 1-888-736-6650



STATMAN CONSULTING

Statman Consulting focuses on three business areas

- **Financial Services Training:** Banking & Financial Markets; Institutional Investors and Portfolio Management; Advanced Financial Products
- **Technical Authoring and Training of Financial Software**
- **Recruitment of Financial/Software Trainers & Technical Authors**

Statman Consulting was established by Sara Statman in March 1999 to offer professionals, with clients in the Financial Services industry, a clear understanding of their clients' business. The courses are not designed to teach candidates how to become Investment Bankers or Fund Managers. Instead they are a rapid, yet effective way of demystifying the jargon associated with the Financial Markets. Each course covers the major players, the role of each department, where it fits into the overall schema and offers a detailed overview of Financial Products.

Europe:
 Statman Consulting
 Rivington House
 82 Great Eastern Street
 London EC2A 3JF
 Tel: 44-020-7749 7200
 Fax: 44-020-7739 8683
 Mob: 44-07961-343386

North America:
 Statman Consulting
 1 Yonge Street
 Suite 1801
 Toronto ON M5E 1W7
 Toll free: 1-866-369 5600
 Fax: 1-416-369 0515
 Cell: 1-416-876 6624

www.statmanconsulting.com

“we are able to correctly anticipate the future direction of volatility an average of 75% of the time”

“a rapid, yet effective way of demystifying the jargon associated with the Financial Markets”

WWW.WILMOTT.COM FORUM

Next Nobel Prize



Who do you think is realistically most likely (I am not saying that you would like to see !) to be the next Nobel Prize winner from Quantitative Finance?

Again we can nominate up to the usual three

I say Robert Jarrow, Darrell Duffie and Ken Singleton.



surely heath, jarrow and morton or wait another ten years and reward something on credit derivatives

spursfan



so who do you think is next?

reza



Maybe the Nobel Prize will be given next five-year and not necessarily next ten year. I suspect that the potential nominee will be from Olsen research group. Currently, as I was told, they are working very hard developing certain models, far beyond the BSM original assumptions. Unfortunately, I do realise that they may use their in-house models to make money rather than winning the Nobel Prize...

David



"They are working very hard developing certain models, far beyond the BSM original assumptions. Unfortunately, I do realise that they may use their in-house models to make money rather than winning the Nobel Prize..."

Omar

I very much doubt that there are any 'secret' extensions of BSM, or anything like that, that make a cent. They may be looking at better hedging strategies, or correlations, or things like that, but no real models. I always hear this sort of thing, and it always turns out to be words.

Reza: Modesty forbids



Pat

I can't think of any post-1973 work worth a Nobel Prize.

P

Paul



\$1.2 Million for the proof of Fundamental Theorem of Asset Pricing

Chukchi Wittgenstein Award



<< I can't think of any post-1973 work worth a Nobel Prize. >>

reza

Are you saying Black-Scholes was worth the Prize???

I thought you hated risk-neutral !!!



<< Who do you think is realistically most likely (I am not saying that you would like to see !) to be the next Nobel Prize winner from Quantitative Finance?

KO

Again we can nominate up to the usual three

I say Robert Jarrow, Darrell Duffie and Ken Singleton. >>

This is hard. I have often heard that Jarrow's results, or rather the mathematical content, is provided by the smart people at Cornell around him. Somewhat hard to believe, but maybe.

Brings up another question - when do the finance phd people have the time to study real analysis, measure theoretic prob., and stoch calc? At what level do they really understand the math?

Duffie certainly knows his math. But can he write a paper without referring to the "usual conditions". Is everything done in terms of martingales? Although, I admit his stuff is worth reading (if you can take reading it 20 times to really grasp it).

What is the usual time between results and Nobel prize? Fairly long, I think. Also, with finance, or rather economics, it seems to take a result that changes the way of thinking to warrant a Nobel prize. In that respect, BSM was worthy.



<< I can't think of any post-1973 work worth a Nobel Prize.

P >>

I absolutely agree with Paul. Scholes and Merton were conferred No-

Vincent

If you do want to join the Forums, it's real easy. Just log on to the site, follow links to the Forum and sign up. The eager users of the Forum are even sending us their own personalized avatars (author icons), please feel free!

(BTW we've left the unique spelling and grammatical constructions of the Forum members in their original form. We believe this adds authenticity to our Newsletter summaries.)

"I can't think of any post-1973 work worth a Nobel Prize."

WWW.WILMOTT.COM FORUM CONT'D

bel price because they change the finance field from accounting and actuarial base to quantitative finance. They give new branch of finance and great contribution to Human beings in terms of economics.

Vincent



>post 1973 work

Hamilton

Perhaps its only me, but there is something faintly poetic about Alfred Nobel being the inventor of dynamite, and the Merton-Scholes involvement in the LTCM debacle. But again, perhaps its only me.

The Right Honorable William



<< I can't think of any post-1973 work worth a Nobel Prize.>>

bru

Again, I agree. Though, I think if it *does* go to a finance professor or an economist working in finance in the relatively near future, the most likely one must be Sanford Grossman for his work in information economics related to trading. If the data had supported their models better, one would have favored Breeden for his consumption CAPM or Cox, Ingersoll, Ross for their term structure work, but the data has not been so kind.



rbh

<<Perhaps its only me, but there is something faintly poetic about Alfred Nobel being the inventor of dynamite, and the Merton-Scholes involvement in the LTCM debacle. But again, perhaps its only me.>>

Poetic? Yup, it's only you.



Max

Theoretically, Sandy Grossman's work on how information gets into prices, and what information prices reveal, is elegant and deep. Empirically, Eugene Fama dominates the debate about CAPM and APT, nothing fancy, but thousands of common sense, and did seminal work in defining what an efficient market means and how one tests it (e.g., always a joint test of a particular model and rationality). Richard Roll's critique of CAPM tests in 1977

really changed the way CAPM was tested, was surprising, and mathematically interesting. Ross's Arbitrage Pricing Theory might stink as an empirical theory, but his observation that returns must be linear in a risk factor to avoid arbitrage is highly restrictive and extremely obvious with hindsight (a great combination). Heath-Jarrow-Morton tied volatility to forward prices in another now obvious insight, and perhaps they used more math than they needed to make this point, but it is now in every term structure model.

Then, there's corporate finance: Hart & Moore, Myers and Majluf, Jensen and Meckling, Townsend. There have been major changes in how we view the firm because of these insights.

Unlike sociology, there actually have been papers that have led to a cumulative advance, even if not as many as we'd like.



Aaron

To appreciate Eugene Fama, you have to consider the body of work done by him and his students. The event study was the basic weapon that won the war against ignorance and superstition. This is what made modern finance possible. I don't think that's the sort of thing the Nobel Prize usually rewards.

Aaron Brown



Omar

"I don't think that's the sort of thing the Nobel Prize usually rewards."

I think that Fama is a very good choice. If Herbert Simon, deservedly, got the Nobel prize for something as "common sense" and "obvious" as "People are not always rational", then why shouldn't Fama?



Paul

I'm sorry but I don't care how elegant and deep something is, nor is common sense the only criterion for winning a Nobel Prize. In layman's terms, you've got to be damn smart, and do something that is both unique and useful.

Both the Nobel Prize for Economics (a pub-

"Unlike sociology, there actually have been papers that have led to a cumulative advance, even if not as many as we'd like"

WWW.WILMOTT.COM

FORUM CONT'D

licity stunt for the Bank of Sweden) and for Peace are a disgrace and should be abandoned.

I will just about excuse the Literature Prize, most of the writers are awful but there are a few gems in there. OK, on similar grounds I'll let Peace back in!

P



Omar

But, Paul, common sense is both unique and useful, and you need to be damn smart to have it. How often do you meet any?



Paul

Omar, if only the people without common sense knew they didn't have any, the world would be a much better place!

P



David

<< Both the Nobel Prize for Economics (a publicity stunt for the Bank of Sweden) and for Peace are a disgrace and should be abandoned. >>

Many and many intellectual minds from where I come from will totally agree with you!



scholar

<< I will just about excuse the Literature Prize, most of the writers are awful but there are a few gems in there. OK, on similar grounds I'll let Peace back in! >>

Yassir Arafat, for example.



Omar

Calm down, everybody. Calm down.



reza

actually Aaron, Fama and French have a good shot ... I had forgot about them completely

now others ... I reiterate : I did not say who do you think deserves to get it, it's who do you think will get it ... (for better or worse)?



scholar

<< Calm down, everybody. Calm down. >>

We're cool.



Aaron

<< Omar, if only the people without common sense knew they didn't have any, the world would be a much better place! >>

Unfortunately, one of the consequences of lack of common sense is inability to judge yourself. I recall a study a few years ago that demonstrated the common-sense adage: self-rated ability is inversely related to actual ability. I recall this was true for mathematical and general knowledge tests, also for humor and likeability. For the first two categories, people took a multiple choice test in the subject and AFTER TAKING THE TEST rated their ability in the subject field of the test. The lowest scorers gave themselves the highest ratings, the highest scorers gave themselves middle ratings and the middle scorers gave themselves the lowest.

For the second two categories, people in a small group were asked to either tell a funny story or describe themselves. Afterwards, each person rated themselves and the others in the group for funniness or likeability. Again, the people who gave themselves the highest scores got the lowest scores from others.

I have also noticed this in my business as a shareholder activist. Walk into the boardroom of a successful company and you will hear lots of self-criticism. People know they're good, but also that they aren't perfect and have to focus and work to keep on top. Go into a boardroom of a company that hasn't returned a penny to shareholders since WWII, whose stock price has gone only down, with unhappy workers and customers, that hasn't received any positive recognition; and you'll find a bunch of cheerful stuffed shirts, congratulating themselves on being masters of the universe. They're genuinely surprised and hurt when someone like me questions their record.

Aaron Brown

Cont'd on www.wilmott.com/forum

“Go into a boardroom of a company that hasn't returned a penny to shareholders since WWII, whose stock price has gone only down, with unhappy workers and customers, that hasn't received any positive recognition; and you'll find a bunch of cheerful stuffed shirts, congratulating themselves on being masters of the universe. ”

WWW.WILMOTT.COM BOOKSHOP

Introduction to Mathematics of Financial Derivatives

by Salih Neftci

Published by Academic Press
2nd edition, published in 2000
527 pages, Hb

Our price: £31.30
Normal price: £32.95
You save £1.65 (5%)

Jacket text

Using an intuitive, systematic approach to the material, Salih Neftci introduces the mathematics underlying the pricing of derivatives. The interest in dynamic pricing models is increasing due to their applicability to practical situations. With the freeing of exchange, interest rates, and capital controls, the markets for derivative products have matured, and pricing models have become more accurate. An Introduction to the Mathematics of Financial Derivatives fills the needs of professionals PhD students, and advanced MBA students who are specifically interested in these financial products.

Contents

1. Financial Derivatives
2. A Primer on the Arbitrage Theorem
3. Calculus in Deterministic and Stochastic Environments
4. Pricing Derivatives
5. Tools in Probability Theory
6. Martingales and Martingale Representations
7. Differentiation in Stochastic Environment
8. The Wiener Process and Rare Events in Financial Markets
9. Integration in Stochastic Environments
10. Ito's Lemma
11. The Dynamics of Derivative Prices
12. Pricing Derivative Products
13. The Black-Scholes PDE
14. Pricing Derivative Products
15. Equivalent Martingale Measures
16. Tools for Complicated Derivative Structures

Published by
Academic Press,
second edition 2000

Visit the Quantitative
Finance bookshop at
www.wilmott.com
to order

The screenshot shows the Wilmott.com website interface. At the top, there's a navigation bar with links like Home, Search, and Jobs Board. Below that, a search bar is visible. The main content area displays a list of books under the heading 'Bestsellers'. Each book entry includes a cover image, title, author, publisher, and pricing information. The first book is 'Advanced Modeling in Finance Using Excel and VBA' by Merv Jackson, published by John Wiley & Sons Ltd, with a normal price of £31.95 and a current price of £29.71, saving £2.24 (15%). Other books listed include 'Foolish by Randomness' by Nassim Taleb, 'Paul Wilmott Introduces Quantitative Finance', and 'Paul Wilmott on Quantitative Finance'.

**Wilmott.com now has its own
bookshop. Discounts of up to 15%.
Book reviews and discussion
in the new Book Forum.**

WWW.WILMOTT.COM BOOKSHOP CONT'D

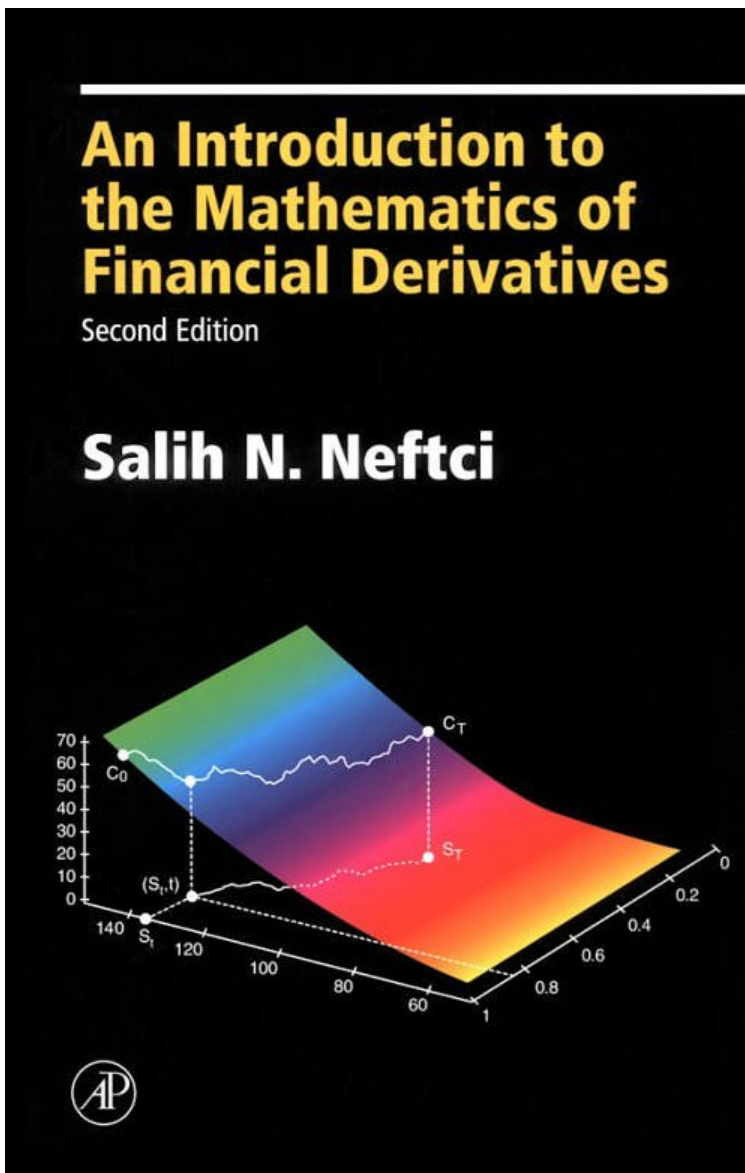
Author

Professor Neftci teaches courses on financial econometrics at the Graduate School of the City University of New York and at the Graduate Institute of International Studies, Geneva. He is the author of several papers on financial econometrics and on time series analysis in leading academic journals. His current research interests include numerical methods in financial asset pricing and the applications of the theory of extremes to risk management.

Reviews

'An excellent treatment of the mathematics underlying the pricing of derivatives.'
John Hull, University of Toronto

'This book will be a major convenience to derivative traders, risk managers, and other users and developers of derivatives models. It greatly reduces the cost of entry into the mathematical world of valuation, hedging, and risk measurement for derivatives positions.'
J. Darrell Duffie, Stanford University



**5% discount at the
wilmott.com bookshop**

WWW.WILMOTT.COM SPECIAL OFFER



14th May - 17th May 2002

Hotel Princesa Sofia Inter-Continental Barcelona

- **PRE CONFERENCE WORKSHOPS - Tues. 14th May**
 - Exploring The Fundamental Tools & Practical Techniques For Pricing & Hedging Interest Rate Derivatives Using Standard & LIBOR Market Models
 - Advanced Theoretical Methods & Latest Practical Techniques For Enhanced Option Pricing & Hedging With Jumps & Stochastic Volatility
- **GLOBAL DERIVATIVES MAIN CONFERENCE DAY ONE - Wed. 15th May**
- **GLOBAL DERIVATIVES MAIN CONFERENCE DAY TWO - Thurs. 16th May**
- **POST CONFERENCE WORKSHOPS - Fri. 17th May**
 - The Latest Theoretical Innovations & Advanced Practical Implementation Techniques For Pricing, Hedging & Trading Using The BGM/LIBOR Market Models And Its Stochastic Volatility Extensions
 - Presenting Brand New Research In The Estimation Of Default Probabilities And The Valuation Of Credit Derivatives

- Leif Andersen
- Jesper Andreasen
- Guillaume Blacher
- Mark Broadie
- Andrew Brogden
- Peter Carr
- Tom Dalglish
- Mark Davis
- Emanuel Derman
- Stephen Dodds
- Ernst Eberlein
- Robert Engle
- Andrew Felce
- Vladimir Finkelstein
- Silverio Forezi
- Sebastian Fritz
- Jim Gatheral
- Dan George
- Paul Glasserman
- Patrick Hagan
- Nicholas Hatzopoulos
- Espen Haug
- Martin Haycock
- Martin Helm
- Ali Hirska
- Lane Hughston
- John Hull

- Farshid Jamshidian
- Simon Johnson
- Piotr Karasinski
- Alexander Lipton
- Dilip Madan
- Peter Muller
- Marek Musiela
- Dr Dirk -Jens Nonnenmacher
- Aidan O'Mahony
- Marcus Overhaus
- Evan Picoult
- Dong Qu
- Riccardo Rebonato
- Eric Reiner
- Dan Rosen,
- Steve Ross
- David Samuel
- Myron Scholes
- Eduardo Schwartz
- Carlos Sin
- Nassim Taleb
- Stephen Taylor
- Bert Van Keulen,
- Alan White
- Paul Wilmott
- Duanmu Zhenyu

Wilmott.com exclusive!

20% discount to wilmott.

com readers.

Email

paul@wilmott.com

for details

Hola, amigos!
20% discount.
Email
paul@wilmott.com
for details

APPOINTMENTS

Equity Statistical Arbitrage Quantitative Analyst - London - £90K + bonus - HUX007

American bank seeks statistician to join proprietary statistical and index arbitrage trading desk for European and Asian equities. The successful candidate will develop quantitative trading strategies as part of a small entrepreneurial team where headcount is deliberately kept at a minimum to maximise profit and therefore remuneration. This role would ideally suit a candidate currently working on statistical arbitrage with another bank or hedge fund, who is keen to work with greater autonomy and to participate more fully in the business. However, our client's priority is to find a very strong statistician (to PhD) who has experience working with large quantities of high-frequency data (preferably tick data). Experience of Kalman filtering, autoregression moving average models, and Bayesian statistics are all strongly advantageous. As the main quantitative input to this venture, you will work very closely with the head of the business, who has an impressive track-record of profitable statistical arbitrage trading.

Morgan Kavanagh, Huxley Associates
T: 020 7469 5002
Email: quants.perm@huxley.com

Mention wilmott.com

Huxley www.huxley.com *Finance*

Equity Derivatives Quantitative Analyst - London - £95k + Bonus - HUX004

A top-tier US investment bank seeks a senior quantitative analyst to support its equity derivatives business in London. Sitting on the desk, you will work with traders and structurers to develop pricing and risk management models for exotic equity options. Our client regards this as a key position in the development of this highly profitable operation. The successful applicant will enjoy excellent career progression prospects to either a senior quantitative position or into a trading role. Outstanding potential remuneration. You will have 3 to 5 years experience in the development of derivative valuation models. Your knowledge of equity derivative mathematics will include stochastic calculus and volatility modelling (surfaces, smiles, local volatility). You will also be highly experienced in simulation modelling and numerical analysis. You will have exposure to fund options, exotic deals for single and multiple underlying options, discrete hedging, basket formulae, convertibles and barrier products. It is likely that you will have a PhD in a quantitative subject and strong programming skills in C++ and VBA.

Morgan Kavanagh T: 020 7469 5002
Email: quants.perm@huxley.com

Mention wilmott.com

Huxley www.huxley.com *Finance*

Senior Exotic Interest Rate Derivatives Quantitative Analyst - Amsterdam - \$130k + bonus - HUX005

Our client, a top-tier European investment bank with proven commitment to its exotic businesses, seeks an experienced Interest Rate Exotics quant to join a small but experienced team based in Amsterdam. The desk trades a broad range of exotic products, from Bermudan options to Digitals (including fixed, floating and chooser corridors), and path-dependent options (including ratchets, index amortizing swaps, trigger swaps). As well as projects relating to longer-term modelling issues, you will work on the desk to handle day-to-day pricing and risk management requests from traders. You should have at least 2 years experience pricing exotic fixed income derivatives in a front office environment. Knowledge of highly exotic Interest Rate products would be advantageous. You will have proven experience implementing market standard models, particularly HJM and BGM. The successful candidate will have a strong quantitative background, with a PhD in a numerical subject, preferably financial mathematics. Your knowledge of derivative analytics should include stochastic calculus and simulation modelling. You will also have a hands-on attitude, and a strong practical background in C++. Close contact with traders means that strong interpersonal skills are essential.

Morgan Kavanagh T: 020 7469 5002
Email: quants.perm@huxley.com

Mention wilmott.com

Credit Derivatives Structurer-London - £95,000+ Bonus-HUX008

Top US bank seeks a credit derivatives structurer to join its London operation, expanding rapidly in both flow and structured deals. The desk handles a range of structured credit products including default swaps, CDOs, repackaged finance, and synthetics. You will be responsible for the further development of the structured and exotic credit derivative business. This is an opportunity to join a highly profitable group in the vanguard of this growing business area. The ideal candidate will have more 2+ years experience in a fixed income structuring role preferably within credit derivatives. A good understanding of balance sheet and regulatory capital trades, securitization and SPVs is required. You should appreciate the limits of modelling credit derivatives after the inclusion of contingencies such as interest rate and FX risk.

Applications are also welcomed from credit or interest rate derivatives quantitative analysts who can demonstrate an understanding of the business from a transaction and deal-making perspective. Your academic background should demonstrate a record of consistently exceptional achievement and you will have strong commercial experience of derivative mathematics - stochastic calculus and complex numerical simulations, including Monte Carlo.

Morgan Kavanagh, Huxley Associates
T: 020 7469 5002

Email: quants.perm@huxley.com

Mention wilmott.com

APPOINTMENTS CONT'D


**Fund Derivatives Structurer - London -
££ Highly Competitive - ER005**

A large European House are currently looking for a Structurer to join their alternative investment group. The role is within a small London based team with a global mandate. The candidate must have a proven strength in quantitative methods as well as strong interpersonal skills. They must have previous experience in either the structuring of fund derivatives or credit structuring. The candidate will be required to take the deal from the client presentation stage, establishing their requirements, structuring of the deal through to completion of the product. Liaison with clients and team members is an important part of the role and therefore proven experience in client liaison would be an advantage

David Hall

Elliott Ross Associates

T: 020 7264 2224 Email: david@elliott-ross.co.uk

Mention wilmott.com

Quantitative Structuring - London - £ Competitive - ER004

The team is responsible for all aspects of quantitative credit research (pricing and risk management) within Fixed Income. This includes the design and implementation of models for all credit sensitive instruments. The team is divided broadly between two functions, namely quantitative research and quantitative structuring. The quantitative research team provides quantitative support to the credit business on pricing and risk management issues.

The quantitative structuring team is responsible for development and implementation of models for issues relating to the structuring of credit derivatives and has day to day involvement in the business.

The Role

- Development and implementation of models for quantitative issues related to structuring of credit derivatives.

- Provide tools to address rating agencies modelling issues and other structuring related issues.

Requirements

- PhD in quantitative discipline and possibly 1-3 years experience in a relevant role.

- Excellent quantitative skills with ability and enthusiasm to learn more about quantitative finance.

- IT skills with experience of VB and excel and preferably C/C++.

- Excellent communication skills.

David Hall, Elliott Ross Associates

T: 020 7264 2224 Email: david@elliott-ross.co.uk

Mention wilmott.com

fleet search & selection

Quantitative Credit Risk Manager - London - circa £80,000 + bonus - FS006

Our client, a major European banking group, seek an individual with strong academics to work in a highly quantitative team within the Economic Risk Capital Reporting function.

Responsibilities include:

- Conceptual assistance in implementing and maintaining a firm-wide Economic Risk Capital (ERC) framework for risk assessment and performance measurement.

- Development and implementation of ERC for credit risks, both for lending portfolios and for counterparty risk in derivatives positions.

- Support and development of active portfolio management for credit risk using both ERC and fair value/market pricing based methodologies.

- Further development of portfolio modelling at the Group for internal and external use including novel conceptual development.

You should possess:

- a minimum 1st Class honours degree in a quantitative discipline, preferably with quantitative MSc or PhD;

- 4+ years' experience of quantitative credit environment gained typically either in a bank or via a consultancy;

- preferably with some knowledge of credit portfolio models and of the behaviour of credit risk at a portfolio level and of finance theory generally.

The role has come about due to internal transfer of the previous incumbent to a senior quantitative position within the Group and further opportunities to progress internally are guaranteed.

Craig Phipps, Fleet Search and Selection

T: 020 7246 6500

Email: craighipps@fleetsearch.co.uk

Mention Wilmott.com when contacting this agent

fleet search & selection

Capital Markets

Risk Manager -

USA - \$200-250,000

package - FS007

Covering capital markets across the breadth of this banking groups operations including both the Fixed Income and Equities desks, this role also involves the review of new derivative products and structures. The successful individual will be responsible for the development of market risk methodologies and introducing cutting edge market risk techniques to advance exposure information for traders.

You should possess:

- 4+ years market risk experience within a capital markets environment;

- good knowledge of fixed income and equity products including derivatives;

- a degree in a quantitative discipline, preferably to PhD

- solid communications skills as this is a front office facing role.

The position has come about due to the present incumbant moving internally to a front office trading role, similar opportunities will also be available to the right candidate.

Craig Phipps, Fleet Search and Selection T: 020 7246 6500

Email: craighipps@fleetsearch.co.uk Me ntion Wilmott.com

APPOINTMENTS CONT'D



**Credit Derivatives
Quant - London -
£90,000 + Bonus -
ERG012**

Two top-five Credit Derivatives Houses are looking to expand their global research

capability with the addition of experienced quants to fill a number of immediate roles. There are positions in product development, structuring and trading (entry level for quants looking to become traders). The research roles will require advanced modelling skills, pricing and structuring. It is important that candidates have been schooled in a strong credit derivatives environment for at least 2 years and can demonstrate familiarity with a wide range of structured products and risk management tools. You should also have extensive experience in numerical analysis and have a postgraduate qualification in a quantitative discipline (MSc, PhD).

Peter Fahy
Executive Resourcing Group
T:020 7645 8800
Email: pfahy@erguk.net
Website: www.erguk.net

Mention Wilmott.com when contacting this agent



**Equity Derivatives
Quant Analyst - Lon-
don - £95,000 + Bonus -
ERG011**

This major American House is seeking an experienced quant analyst

to support the exotic equity derivatives desk. You will be responsible for equity derivative model development, pricing and risk management for exotic structured products. As this role is desk based, a pre-requisite is that you will have at least 2 years experience in a similar environment. You should also have extensive experience in numerical analysis, C++ and have a postgraduate qualification in a quantitative discipline (MSc, PhD).

Peter Fahy
Executive Resourcing Group
T:020 7645 8800
Email: pfahy@erguk.net
Website: www.erguk.net

Mention Wilmott.com when contacting this agent



**Synthetic CDO Struc-
turer- London- £100k
+ bonus - ERG010**

This bulge-bracket Investment Bank is looking to add a senior

Credit Derivatives Structurer to its busy CDO team. Deals include managing large synthetic securitisation transactions for its own balance sheet and for third party clients. Transactions will include origination, if appropriate, structuring, rating agency process, documentation and some participation in the marketing of tranches with the sales force. Appropriate candidates should have at least two years structuring experience within a successful Credit Derivatives team. They will have a strong training in quantitative finance and a good grasp of modelling techniques. Candidates who have developed from the related disciplines of Interest Rate Derivatives or Cash Securitisation are also encouraged to apply.

Peter Fahy
Executive Resourcing Group
T:020 7645 8800
Email: pfahy@erguk.net
Website: www.erguk.net

Mention Wilmott.com when contacting this agent



**Senior Equity Deriva-
tives Quant Research
Analyst (x2), - London -
Up to £150k - ERG006**

I have two clients that are seeking to recruit a senior quant to work within their

equity derivatives quantitative research teams based in London. You should have minimum of 3 years experience in a QR team focussing on ED products. For one of the positions, they would look at candidates from a fixed income or credit derivative background. For further details, please either send details via email or contact me to discuss.

Peter Fahy
Executive Resourcing Group
T:020 7645 8800
Email: pfahy@erguk.net
Website: www.erguk.net

Mention Wilmott.com when contacting this agent

APPOINTMENTS CONT'D

commodity appointments

Financial Engineer, Energy Derivatives Research - Amsterdam - \$ Negotiable - CA005

To join major European energy player in their quantitative team. The Financial Engineer will be responsible for designing & implementing (C++) Exotic Derivative models using Monte Carlo techniques or other numerical techniques (e.g. solving numerical differential equations). Both derivative contract specifications & underlying value behavior are very different from the default financial engineering theory. Modeling is done through analysis of historical data & common sense. Building tools for data analysis is another part of the job. An example would be routines that calculate historical or implied volatility, mean reversion rate, etc. Also, he or she will be responsible for supporting the Risk management, Pricing & Trading departments with these models. This means that functionality of the models should include risk & hedge information. IT tasks will be integrating the C++ with excel (DLL, COM) and other deployment systems (CGI on a Web server etc). Also other general IT development task such as testing & validating the models, making samples etc are parts of the job. The ideal candidate should be educated to PhD level, have strong financial mathematics skills, development ability and some trading room/product exposure (practical or theory)

Jakob Bloch**Commodity Appointments****T: 020 7626 3666****Email: jakob@commodityappointments.com****Mention Wilmott.com when contacting this agent**

commodity appointments

Energy Structuring, Senior Analyst, German Power/ Gas - Amsterdam - Negotiable - CA004

For major European energy trader. The Senior Analyst will be responsible for interfacing between Trading and Origination desks, evaluate retail (commercial) energy supply & structured origination deals, value fixed & index structures plus various option components for gas & power, analyse customer demand profiles, assess swing/imbalance risk, and price according to product specifications and forward commodity/volatility curves. In addition the Analyst will be responsible for incorporating financial derivatives into tailored risk products and utilise market knowledge and valuation skills to promote innovative product solutions. The ideal candidate should have experience in structuring and pricing commodity transactions, understand retail energy risk, specifically volumetric swing exposure and imbalance economics, understanding of transmission/transportation mechanics. Furthermore knowledge of physical/financial derivatives (swaps, options, spread products), understanding of wholesale energy trading markets & associated retail liquidity constraints. Advanced statistical/quantitative skills and master's level academic credentials - Technical or Business. Experience in natural gas & electricity structuring in Germany. Relevant linguistic skills in German and/or Dutch an advantage.

Jakob Bloch**Commodity Appointments****T: 020 7626 3666****Email: jakob@commodityappointments.com****Mention Wilmott.com when contacting this agent****Senior Quantitative Analyst, Credit Derivatives - London - £ Competitive - ER002**

A vacancy has arisen with a large US house for an experienced quantitative analyst to join the Credit Derivatives research team. The team is structured on a global basis and currently have 5 based in London. They are looking to add to the

London team. The individual must have a strong academic background (PhD in a quantitative subject-Maths, Finance, Physics or Engineering) and must also have at least three years front office experience. The team sits together on the trading floor and works closely with the trading desk. Responsibilities will include the pricing and modelling of a wide range of credit derivatives including credit default swaps, first-to-default swaps and some contact with quanto default swaps as well as structuring credit products such as CDOs. There will be an equal mixture of Maths and implementation.

David Hall**Elliott Ross Associates****T: 020 7264 2224 Email: david@elliott-ross.co.uk****Mention wilmott.com**

Many more appointments at www.wilmott.com/forum. Appointments have their own section within the Forum.

SERVING THE QUANTITATIVE FINANCE COMMUNITY

Team Wilmott

Ed. in Chief: Paul Wilmott
paul@wilmott.com

Editor: Dan Tudball
dan@wilmott.com

Sales: Andrea Estrella
andrea@wilmott.com

Web Engineer: James Fahy
james@wilmott.com

Tech. Coord.: Jane Tucker
jane@wilmott.com

Reviews: William Hearst
bill@wilmott.com

Extras: Gary Mond
gary@wilmott.com

Phone: 44 (0) 20 7792 1310
Fax: 44 (0) 7050 670002
Email: wrr@wilmott.com

Wilmott Research Report is published fortnightly. Reproduction in whole or in part is expressly forbidden. To receive your copy by email, contact wrr@wilmott.com.

Wilmott is a registered trademark

Wilmott website and newsletter are regularly read by thousands of quants from all the corners of the globe. Readers can be found in investment banks, hedge funds, consultancies, software companies, pension funds and academia.

Our community of finance professionals thrives on cutting-edge research, innovative models and exciting new products. Their thirst for knowledge is almost unquenchable.

To keep our readers happy we are proactive in seeking out the best new research and the brightest new researchers. However, even our eagle eyes and relentless searching occasionally miss something of note.

If you are active in quantitative finance and would like to submit work for publication on the site, or for mention in the newsletter, contact us at submit@wilmott.com.

WWW.WILMOTT.COM CAREERS

Banc of America Capital Management has appointed **David Stanley** as a director, and portfolio manager and European specialist. Stanley served as a fixed-income fund manager for Morgan Stanley Asset Management in London. He reports to **Ram Willner**, MD of global fixed-income investments for Banc of America Capital Management.

BNP Paribas has appointed **Eli Lapp** as senior high grade credit research analyst. Lapp joins from HSBC Securities where he was a MD in fixed income research. He reports to **Joseph Labriola**, head of high grade research in the US for BNP Paribas.

Barclays Capital has appointed **Ottavio Muzi-Falconi** as head of Italian debt capital markets. He previously worked for Merrill Lynch as head of European corporates. He will report to **Christophe Angely**, head of debt capital markets for southern Europe, and **David Lyon**, head of debt capital markets European financial institutions coverage.

BNP Paribas has appointed **Razi Amin** and **Örn Greif** as senior securitisation originators. Amin will head the structured credit origination for Asia Pacific, excluding Japan, and reports to **Brian Lazell**, head of credit markets Asia Pacific, and **Michael Donahue**, global head of securitisation. Örn Greif, who previously worked as director of securitisation for Normura, will report to **Fabrice Susini**, head of securitisation for northern Europe.

BNP Paribas has appointed **Brent Smith** and **Guido Schnitker** to the firm's equity sales desk. Smith will be part of a New York sales and sales trading team, and will report to

George Cook, head of equity sales in New York. Smith worked for Credit Suisse First Boston as vice-president on the western European sales desk. Schnitker will report to **Karl Justus**, head of equity sales Frankfurt, selling to German institutional clients. He joins in April from Dresdner Kleinwort Wasserstien.

Credit Suisse First Boston has appointed **Andy DePhillips** as director of the global foreign exchange sales group. DePhillips joins from Citibank, where he was responsible for the bank's largest institutional clients.

Deutsche Banc Alex Brown has appointed **Marion Boucher-Soper** as the head of US investment grade credit research. She reports to **David Folkerts-Landau**, the head of global markets research. Also, **Ann Maysek**, **John Otis**, and **Joseph Princiotta** will join the firm as senior investment-grade credit analysts.

Bear, Stearns has named **Jeffrey Mayer** and **Craig Overlander** as joint heads of the fixed income division. They both currently serve as senior MDs and as members of the board of directors. They will continue to report to **Warren Spector**, president and co-chief operating officer.

JPMorgan has appointed **Joerg Pruessmeier** as MD and co-head of equities in Germany, and **Christian Berchem** as MD and head of European equity sales for Germany. Pruessmeier joins from Merrill Lynch, where he served as a MD and deputy head of equities in Germany. Berchem also joins from Merrill Lynch, where he most recently served as a managing director in European equity sales.