



Asymptotix



Value Proposition

Open Source Financial Predictive Analytics

<http://www.asymptotix.eu/fpa.pdf>

<http://www.asymptotix.eu/ecap.pdf>

<http://www.revolution-computing.com/industry/finance.php>

- The source of the Credit Crisis was in large part crucial failures in internal reporting and IT systems which comply with “Transparency Standards”.
- The Transparency Standards are being toughened by the Governments worldwide, right now; to be defined finally after the G20 in London in April 2009.
- There is general consensus that the banks and insurance companies never even met the transparency standards in place in 2006 (pre Crisis). Now they are being ‘enhanced’, ‘tightened’.
- There is no question that in general black box proprietary closed source predictive analytics have failed the banking industry and thus society.
- On the other hand the large scale data management platforms for banking from IBM and SAP cannot be dismissed nor bettered. They have invested so much intellectual capital in these platforms it would take millennia for Open Source to catch up in that layer of the stack.
- The next step has to be about Open Source, almost certainly with a commercial backing in terms of support. Open Source is not exclusively about Predictive Analytics, it’s just that the Community aspect is eminently applicable to predictive analytics, since the problems are generally hard and are generally iteratively solved.

Supervision / Risk Quantification

- The Community Open Source idea in relation to meeting Banking Supervision requirements is just the kind of innovation in thinking and technology that Europe should be exhibiting in the middle of this recession, to develop a path to the future and exit this recession on a stable trajectory such that a Crisis like the one we are in will never happen again.
- The detailed evidenced argument that the manner of implementing risk analytics is already done by the Central Banks and Academics is out there, this entails that there is no need for any single financial entity to re-invent the whole domain intellectual capital of macroeconomic stress testing.
- Through Community sharing, statisticians and economists in the banks can begin the process of development of macroeconomic through the cycle risk and capital quantification.
- Only through the cycle (a priori not pro cyclical) risk capital estimation predicated upon either full blown DSGE models or pragmatic stochastic positivism (Professor McNeil) will enable the reopening of the wholesale credit markets in Europe.

The Argument for

- Commercial econometric software in the US started in Boston at the Massachusetts Institute of Technology (MIT), more specifically at the Center for Computational Research in Economics and Management Science.
- In the 1970s, code developed at MIT was not really copyright protected; it was built to be shared with the FED and other universities.
- Through the 60s and 70s various statistical modeling packages for economics were built particularly at Wharton, the University of Michigan and the University of Chicago (where the Cowles Commission had been located).
- At Princeton the focus was on development of econometric models in FORTRAN. The use of FORTRAN is much declining now but Chris Sims, now at Princeton, who developed the VAR methodology in an applied manner and was at the forefront of RE in the 1970s now makes all his models freely available in R.
- More and more econometricians are switching to the freely-available statistical system R. Free procedure libraries are available for R, <http://www.r-project.org> , an Open Source statistical system which was initiated by statisticians Ross Ihaka and Robert Gentleman.

Information Technology

- We are systemically dependent upon innovations in financial technology now. Computation of risk capital in an holistic and comprehensive manner is the key to recovery from this crisis episode.
- **We have to meet the complexity of our financial technology needs with our response in terms of information technology!**
- The key business accelerator in Open Source is Community, particularly in Financial Predictive Analytics; since it is via the community in an open source framework that one's initial intellectual capital is gathered.

The Logic of the Computing Challenge

- R is designed by statisticians for statisticians. The implication is that it is not designed by computer scientists, let alone HPC experts.
- Good data modeling cannot help time series data, time series just is what it is.
- It is crucial to retain the attention and “affection” of users, (stickiness in a way) to a complex development environment like that necessary for econometric modeling
- HPC for R and support for the technology are necessary to set open source predictive analytics to work in a "production" environment.
- R runs in serial if left to its own devices. On datasets where really compute intensive models are applied in some instances the predictive techniques are so computing intensive that they require to run for 10s of hours on a standard, even large scale system rack or run out of memory/crash or both.
- That is why predictive analytics draws in the requirement for the High Performance Computing (HPC) platform, which means putting clusters of processors together in parallel to run simultaneously at one problem rather than running sequentially at several problems.

REvolution Computing

PARALLEL



- REvolution enhance R to make it scale in parallel. There is scale up parallelism (which takes advantage of high performance numerics optimized for Intel x86 architectures that REvo has privileged access to) and scale out parallelism (using REvo's parallelR) to run models on arbitrarily large clusters.
- REvolution compile R within REvolution R Enterprise (to GAMP 5 standards) and integrate both scaling techniques, so that the R user has no additional or different programming to do. It "just works", and is a supported platform for research, production and regulated environments.
- Financial Predictive Analytics draws in the requirement for the High Performance Computing (HPC) platform, which means putting clusters of processors together in parallel to run simultaneously at one problem rather than running sequentially at several problems.

Commercial Open Source – Development and Production

- **THE DEVELOPMENT PHASE**

- There are commercial challenges to managing an Open Source project in-house. Some Banks can do it but it is "new stuff". All too often we ignore the real effects of "new stuff" on our project timescales. The impacts of technology change on IT projects in general and on the planning process in particular is often underestimated. You need to have the right knowledge and experience about the new stuff; methodology and development techniques; to plan and execute on its implementation.

- **THE PRODUCTION PHASE**

- Many times a user can get confused between what is a code issue and a methodology issue.
- The User is not like any 'normal' user, the user is probably a PhD or at least Masters educated.
- There is no way that an ordinary user can manage all of the disparate communities and forges which exist and may develop in an open source development language that is they key deliverable of the support centre to appraise, unit test and understand all of the objects out there in the social or community networks.

Support for 

- The commercial open source vendor provides a documented, supported build together with recourse in the event of issues with the software, just like any proprietary software vendor. REvolution Computing is the same in its relationship to R in all these respects. Enterprise Mission Critical needs have very real concerns behind them and REvolution Enterprise-level customer support makes REvolution products suitable for professional, commercial and regulated environments. REvolution provides technical support from statisticians and computer scientists highly versed in the R language and the specifics of each REvolution R build; <http://www.revolution-computing.com/support/>
- That is what REvolution Computing provides for R, the Open Source development community environment in which all of the intellectual capital in econometrics since 1946 is embedded. The open source community of worldwide statisticians and econometricians is at the bleeding edge of analytics, but not always creating software that can be set to work in a scale-able fashion, from an IT or production software perspective (it is not designed with that in mind). REvolution is aimed at ensuring that it can – i.e. ensuring that the best from the research world can be used in production.

**REvolution
computing***We do the math*

Financial Predictive Analytic Solution Architecture

- **The Asymptotix methodology** is to combine expert consulting with experienced resourcing. Our Consultants partner with your staff and industry experts so that your project is fully equipped with optimized human capital, providing the highest level of business and technical knowledge. This focused perspective brings project resource to our clients, which has been rigorously validated as appropriate to the specific requirement. Asymptotix can through this philosophy bring optimized specialist resource to bear on each complex task requirement within the overall framework of your project or programme plan.

Asymptotix can assist our clients in the strategy, solution design and implementation of integrated Data Management and Financial Predictive Analytic (FPA) platforms. In other words, the Asymptotix mission in FPA is the integration of 3rd generation BI (Predictive) environments with standard BI toolsets and the data management platforms normally implemented to support them. We can further assist with the planning and architecture for High Performance Computing (HPC) environments for Predictive Analytics, where these may be necessary (and in our view they will be). Asymptotix has further relevant experience with the integration of General Ledger platforms with Risk Management data warehouses or marts and we have the specialist knowledge to integrate FPA tools into the GL environment. In short we can provide the support necessary to assist management to move towards Target Operating Models predicated upon the integration of FPA with the GL and operational BI for Credit, Market and Liquidity Risk analytics, necessary post CC.