Breakthroughs & Abandonment: Patent Abandon Rate is a Reliable Measure of Speculative Portfolios

Written by **Mark Nowotarski**
Markets, Patents & Alliances, LLLC
On Twitter: **patentbuzz**
Posted: September 27, 2010 @ 10:15 pm
Page viewed 7,995 times

Everyone thinks they have a great idea when they file a patent application. Some applications, however, are more speculative that others. We propose that the rate at which patent applications are abandoned is a reliable measure of just how speculative a given portfolio of applications is. We also propose that breakthrough inventions are more likely to be found in portfolios with high abandonment rates than in less speculative portfolios with lower abandonment rates. We support these propositions with data from PAIR.

The abandon rate of a portfolio of applications can be quantified by “abandons per office action”. Abandons per

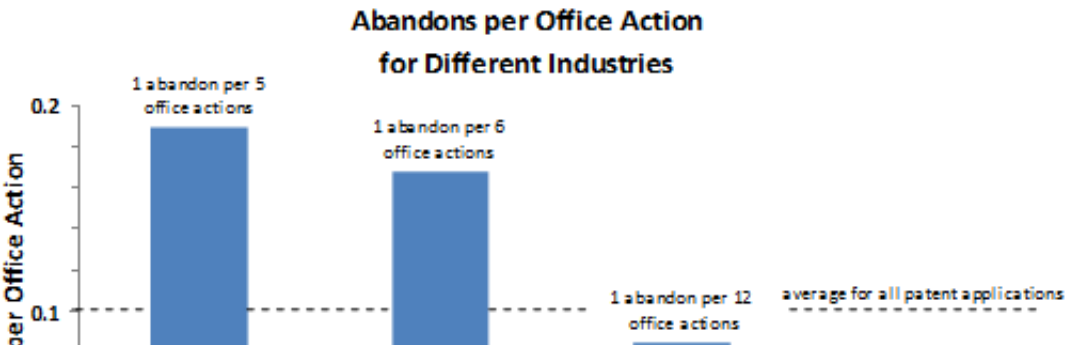
office action is the ratio of the total number of abandons to total number of office actions in a given portfolio. “Abandons” means failure of an applicant to respond to an office action in the statutory time period allowed for response. It also includes express abandonments made at the applicant’s own initiative. “Office actions” includes all correspondence from the patent office to the applicant that has a deadline for response. Office actions with response deadlines include restriction requirements, rejections of claims and notices of allowance.

The data on abandons and office actions for a given portfolio of applications can be found in the USPTO’s **Patent Application Information Retrieval** system (PAIR). Data for each individual application in a portfolio is retrieved by entering the application’s serial number or publication number. The status of an application (e.g. patented, abandoned, etc.) is found on the “Application Data” tab. A listing of the office actions is found on the “Transaction History” tab. The office actions can then be counted. Office actions for still pending applications and issued patents are counted since each of these office actions could have been an abandonment.

The average abandons per action for US utility patent applications is 0.1. This means that one application is abandoned for every 10 office actions in an average portfolio. We examined a random sample of 400 applications filed over the past ten years to measure this ratio. Abandons per action has remained fairly constant over this time period.

Abandons per action can be interpreted as a level of speculation in applications. Applications that have high abandon rates are highly speculative. Most of the inventions described in these applications ultimately have little value and the applications are abandoned quickly. If a portfolio of speculative applications as a whole, however, has value, then that value is concentrated in a few “breakthrough” applications. For some investors, this is a very desirable characteristic and they may wish to seek out portfolios with high abandon ratios.

Applications with low abandons per action cover inventions that are more incremental in nature. Their future value is more predictable and stable. As time goes on, fewer drop out. If the portfolio as a whole has value, then the value is more evenly distributed among the individual applications and there are fewer breakthroughs. An even distribution of value can be a very desirable characteristic for other investors who are looking for more stable “returns on innovation”. Investors of this sort may wish to seek out portfolios with low abandon ratios.



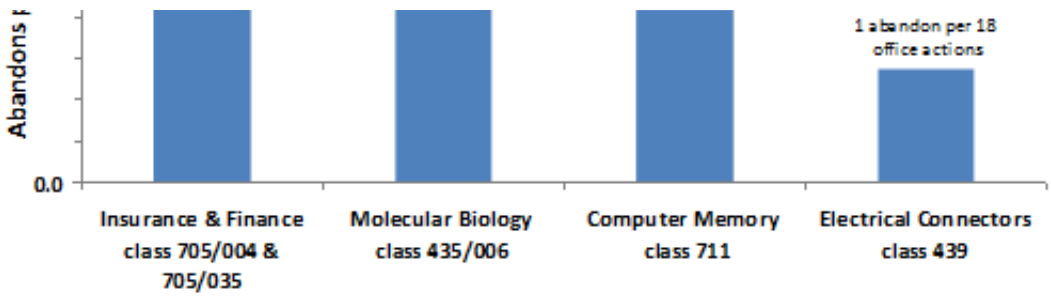


Fig. 1

Figure 1 shows how average abandons per actions vary for different industries. Insurance & Finance and Molecular Biology applications are abandoned at a relatively high rate. These are very speculative areas where most inventions don't pan out, but the ones that do can be extremely valuable. Pharmaceutical companies, for example, file thousands of applications on initially promising compounds and then rigorously weed those out to a remaining handful that cover compounds that become approved drugs. Each one of these remaining compounds can be a billion dollar invention, but it takes an initially large portfolio of very speculative compounds to capture them.

Insurance and finance inventions are also highly speculative. Most of these inventions fail, but some have gone on impact entire economies. Witness the dot com revolution of the 1990s which was largely driven by patented financial business method inventions such as eBay, Priceline, and Amazon.

Computer memory and electrical connector inventions have lower than average abandons per action. Inventions in these fields over the past decade have been fairly incremental. It's been a while, for example, since anyone has invented anything in these fields as fundamental as the transistor or microprocessor.

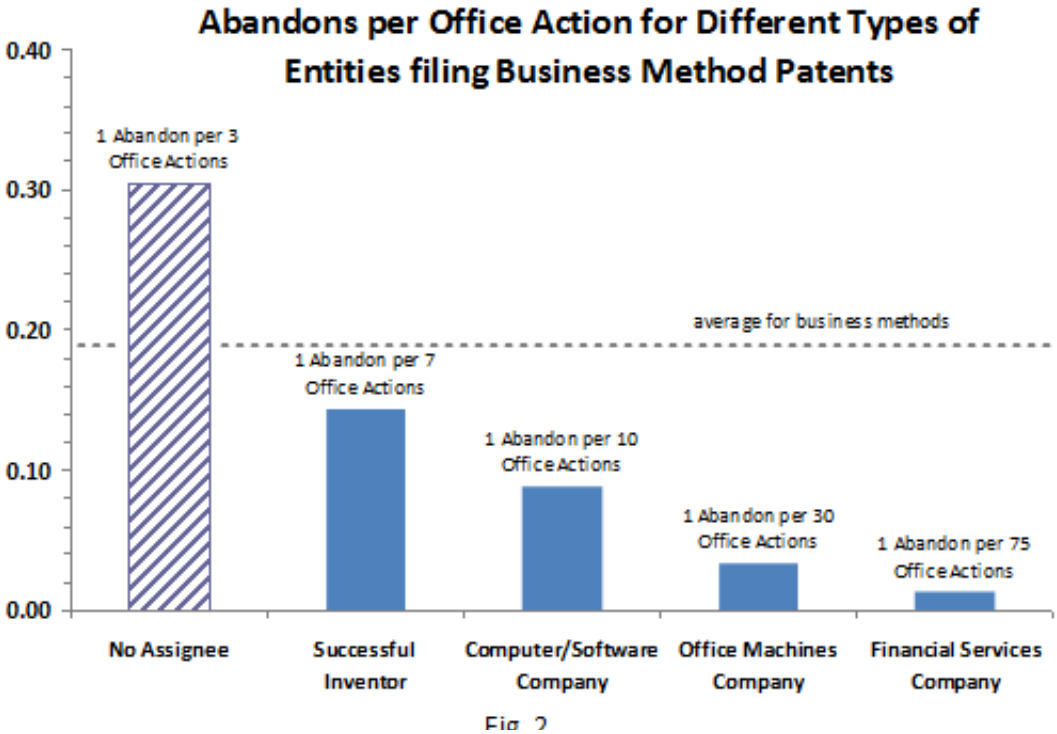


Fig. 2

Fig. 2

The level of speculation in a given portfolio of patent applications is a strong function of who is filing them. Figure 2 compares the abandons per action for different entities in the field of business methods (class 705). Data for three major companies is shown along with that of a successful individual inventor and a large group of independent inventors collectively referred to as “no assignee”.

The major companies include a computer/software company, an office machines company and a financial services company. Each of these companies has filed hundreds of business method applications. The successful inventor has also filed several hundred applications over the past decade. His portfolio is currently valued somewhere in the nine figures. Companies spun off from this portfolio have gone on to significantly impact our economy.

“No assignee” accounts for 30% of the applications in business methods. The data bar is shown striped as opposed to solid to indicate that it is a collection of entities. We don’t know of any billion dollar inventions in this group (yet), but some of these applications have gone on to be enforceable patents with +$80 million litigation judgments assessed against infringers.

The computer/software, office machines and financial services companies present a spectrum of increasing conservatism as reflected in their increasingly lower abandons per action ratios. The computer/software company and office machines company each have formal programs for reviewing their pending applications and abandoning them when their value doesn’t prove out. This even occasionally includes abandoning an application after a notice of allowance. The Financial Services company, on the other hand, has an abandon rate that is so low that it suggests that no review at all is done of ongoing application value. Once the decision is made to file, it appears as if its outside counsel is authorized to prosecute to an allowance no matter how long it takes. Several of this company’s applications have had 10 or more rejections and still outside counsel continues to prosecute. Companies with abandon rates this low might do well to develop policies and procedures to thin out their applications and focus on the inventions that have proven significant value.

Abandons per action is a powerful metric for assessing the speculative nature of a given portfolio of patent applications. High ratios correspond to highly speculative ideas. Low ratios correspond to more conservative ideas. Investors looking to find breakthrough ideas, might do well to examine portfolios with high abandons per action. Investors looking for more stable returns on innovation might do well to examine portfolios with low abandons per action. Entities with exceptionally low abandon rates should perhaps develop policies and procedures to more realistically assess the ongoing value of their innovations and thin out those that don’t fulfill their initial promise so that they can focus on those that do.

About the Author

Mark Nowotarski is the President of Markets, Patents & Alliances L.L.C. and is a registered U.S. patent agent specializing in business method patents. He currently serves clients in the financial services, medical devices, consumer products and manufacturing industries.

Mark is also co-editor of the Insurance IP Bulletin. The Insurance IP Bulletin is dedicated to providing useful information to innovators in the insurance industry regarding the protection of their inventions with patents and ways to effectively promote their innovations.

Mark is a former Associate Director of R&D for Praxair. There he was responsible for the development and successful worldwide introduction of new products into the health care, electronics, and manufacturing industries. He was a leader in the reengineering of Praxair's patent system, and was responsible for technology planning for their home health care division.

Mark is an inventor on 17 US patents. He was appointed Corporate Research Fellow for the commercial impact of his inventions (+$300 million in sales).

Mark has a Master's degree in Mechanical Engineering from Stanford and a Bachelor's degree with honors in Aerospace, Mechanical Sciences and Engineering Physics from Princeton. His academic awards include the Sigma Xi award for most outstanding Mechanical Engineering research at Princeton and the Union Carbide Award for Academic Excellence and Leadership in Mechanical Engineering, also at Princeton.

Tags & Categories

Tags: **abandonment**, **abandons per action**, **investors**, **mark nowotarski**, **patent prosecution**, **public pair**, **speculative portfolios**
Posted in: **Guest Contributors**, **IP News**, **IPWatchdog.com Articles**, **Patent Fools™**

Related Posts

- **Making Progress with Difficult Patent Applications** (♥ ♥ ♥ ♥)
- **Reducing Patent Backlog and Prosecution Costs Using PAIR Data** (♥ ♥ ♥)

- Start-Up Reality: No Patent = No Funding, No Business, No Jobs (♥ ♥ ♥)
- Don’t Steal My Avatar! Challenges of Social Networking Patents (♥ ♥)
- Increasing Patent Allowance Rates by Selectively Targeting a More Technological Patent Class (♥ ♥)
- IPWatchdog 2010: ABA Blawg Tops + Over 2 Million Visits (♥ ♥)
- How to Effectively But Safely Tell the Story of the Invention (♥ ♥)
- Mea Culpa, Patent Reform and Other Issues (♥ ♥)
- Does the Federal Circuit Give Enough Deference? (♥ ♥)
- A Call to Reform Inequitable Conduct This Year (♥ ♥)

Share & Enjoy With Social Networks

8 comments
Leave a comment »

1. Paul F. Morgan **September 28th, 2010 10:53 am**

   If based on the regular, phony, PTO abandonment statistics [which count all of the many RCE's and continuations as abandonments, when in fact that is usually an indication of more agressive and serious prosecution to obtain a patent], then conclusions based thereon are suspect.

2. **Mark Nowotarski** **September 28th, 2010 11:07 am**

   Paul,

   RCEs are not counted as abandonments in the above analysis. I agree with your perspective

that an RCE is really the opposite of an abandonment.

Mark

3. Tom Bakos **September 28th, 2010 5:01 pm**

   Can you explain what you mean by “portfolio of applications”?

4. Ron D. Katznelson **September 28th, 2010 5:13 pm**

   THE SPECULATIVE INFERENCE OF THE SPECULATIVE NATURE OF PATENT PORTFOLIOS

   Mark, you do not define the term “Speculative” or its objective direct indicia and yet you proclaim that “Abandons per action is a powerful metric for assessing the speculative nature of a given portfolio of patent applications.” I know speculation when I see it, particularly in inferences such as those you make above. There are many factors which govern abandonment rate of patent applications, just as there are in abandoning issued patents that are not renewed. One dominant factor which you have not accounted for is the product lifetime in any given technology area. Technologies with short lifecycles become obsolete sooner and a greater fraction of them will not justify patent protection at a given time after filing. This affects abandonment rates both before and after patent grant. There is very little “speculation” in technology areas that have shorter lifecycles. Even after their success, they are abandoned at higher rates than those with longer lifecycles. Adding patent maintenance rate measures as a control in your analysis would have been one of the appropriate ways for you to better separate “speculation” from lifecycle effects and thus avoid your speculative inferences.

   Additional variable you have not accounted for is the time it took the PTO to issue an office action that precedes an abandonment. Evidence shows that longer PTO delays result in higher abandonment rates, an observation that is consistent with the life cycle effect. [See Figure 5 of the paper on Deferred Examination models (Appendix A of comments to USPTO at **http://works.bepress.com/rkatznelson/59/)** showing increase in abandonment rate with the increase in First Action pendency. See also Slides 6-7 showing patent lifetime trends and Slide 11 for abandonment rates by technology areas in the EPO].

   I suspect that you have merely observed the technology cycle time effect. Objective measures for patented technology lifetimes in various technology areas were constructed by CHI/IPQ in the form of Technology Cycle Time (TCT) measures. It is expressed in years based on the median age of references cited in patents in a portfolio and is therefore a strong indicator for technology lifetime pertaining to a given patent portfolio. Your data can be compared to such technology lifetime values. For example, matching the technology areas on which you reported with the closest technology areas in the CHI/IPQ TCT scorecard, your finding that applications in the Molecular Biology area have a lower survival rate than that of Computer Memories and Electrical Connectors applications is consistent with measured Technology Cycle Time values of 9 years for Electronics Components and only 7.5 years for Biotechnology. By using the list of references cited in prosecution, you can construct your own TCT values for the specific portfolios you assembled for verification and control. You will find that your abandonment rate in a portfolio is inversely proportional to TCT values of the portfolio – a result that in no way implies “speculation.”

Finally, although you make strong assertions on value, your analysis actually provides no evidence or data on the value of patent portfolios. It suffers from a fundamental analytical flaw in that it seeks to infer values of granted applications from data on those that were not. It is perhaps this episteme that leads to your unsupported assertions about patent value. The assertion that patent value is "concentrated in portfolios with high abandon ratios" – i.e. with lower survival rate, lacks support and is inconsistent with empirical studies of patent value which show that the more valuable patents are those that survive longer. [See J.A. Barney, "A Study Of Patent Mortality Rates Using Statistical Survival Analysis To Rate And Value Patent Assets", AIPLA Quarterly Journal, 30(3), pp. 317-352 (September 2002); K.A. Moore, "Worthless Patents", Berkeley Technology Law Journal. 20(4), p.1521, (Fall 2005); J. Bessen, "The value of U.S. patents by owner and patent characteristics", Research Policy, 37(5), pp. 932-945, (June 2008)]. Barney's study also shows that survival rate is significantly higher for patents having longer specification or more independent claims. The number of independent claims pending in the application is another significant factor that you can easily include in your analysis to account for such survival effects.

In conclusion, extreme caution is warranted in drawing inferences on the nature of patent portfolio values based on your analysis. I would therefore refrain from making speculations on whether patent portfolios are speculative or not.

Ron Katznelson

5. Ron D. Katznelson **September 28th, 2010 5:32 pm**

   The correct link above should be **http://works.bepress.com/rkatznelson/59/**

6. Paul F. Morgan **September 28th, 2010 8:02 pm**

   Thanks Mark.
   However, don't you think that the high abandonment rate for insurance & finance industries can be attributed to a considerable extent running into vastly more rejections based on 101 [like Bilski] and 112? Plus the discouragingly long backlogs for business method applications? Plus applications from insurance & finance industries filed for defensive purposes?
   Also, unless I'm just missing something here, I still do not see how average abandonment rates equate to patent value analysis. However, I can agree with you that some of the most dangerous troll patents have been those that escaped from the PTO with broad business method and related software claims.

   P.S. While on this interesting subject of statistical patent analysis valuations [of which I am admittedly skeptical in general] I think there are serious flaws in the common assumption [by those running such busineses] that a larger number of citations of a patent in later patents indicates its importance. Because, patents are cited in later patents for their relevance for 103 purposes, not because they are "pioneer" patents, and not because of their claim scope or value. In many if not most cases later patents with more details and embodiments are far more relevant for 103 purposes, and thus cited far more often than older pioneer patents with much broader claims in the technology.
   Furthermore, Professor Lemley, et al, have just published a study of extensively litigated patents which indicates that a large amount of prior art cited in a patent is also not a good indicator or correlator of its sucess in patent litigation [the ultimate quality and value test of a patent]. See the recent "271″ blog post on that. Furthermore, the number of prior art citations

in patents varies widely between companies and examiners who were doing extensive prior art searches at that particular time period , and those that did not.

7. **Dale B. Halling September 28th, 2010 8:49 pm**

   Mark,

   I do not think you conclusion “Abandons per action can be interpreted as a level of speculation in applications. Applications that have high abandon rates are highly speculative. Most of the inventions described in these applications ultimately have little value and the applications are abandoned quickly” is valid unless you control for the financial resources of the inventor or company. Start-up companies cannot afford 3-10 year fights over absurd rejections. The absurd policies of Jon Dudas, rejection equals quality, were time and cost prohibitive for individual inventors and start-ups. However, most break through technologies are created by independent inventors and small entities.

8. **Mark Nowotarski September 29th, 2010 10:47 am**

   Tom,

   Good question. By “portfolio” I mean a set of patent applications that share a common trait. That trait might be the class/subclass, assignee, filing date or any other trait of interest. I try to look at portfolios of at least 100 applications in order to get reasonable statistics.

   Paul,

   You raise some interesting points regarding content of rejections, backlog delay, defensive patent strategies and their possible relationship to abandons per action. I think these are all areas that are certainly worth looking into more carefully. Feel free to contact me if you want to discuss further.

   By the way, I did look at abandons per restriction and abandons per rejection and for most portfolios, they are the same.

   Dale,

   Similar to my comments for Paul, looking into the issues you raise, such as controlling for financial resources, would be an important part of a more thorough study to validate/refute this analysis.

   Ron,

   Thanks for the links to the references regarding technology life cycles. I’d love to do a follow on study to see if abandons per action ratios correspond to failure to pay maintenance fees on the patents that issue from a given portfolio of applications. Unfortunately we only have data for applications that have been published and only a small fraction of those applications have both issued as patents and been up for maintenance fees. Hopefully the USPTO will make PAIR data available for automated download in the not too distant future. That will make it a lot easier to sift through a large number of applications to get reasonable statistics.

Leave Comment