

Scott Guthery's Patent Data Analysis

Note #1: May 23, 2020

Patent Productivity of U.S. Inventors Over Age 50

Age is, of course, a fever chill
that every physicist must fear.
He's better dead than living still
when once he's past his thirtieth year.

– Paul Dirac

Mathematicians as well as physicists, it is said, do their best work before they are thirty. There are exceptions, of course, but many are the mathematicians who reach their thirtieth year and surreptitiously look back and wonder which of their works was the pinnacle of their professional life.

Mathematical creativity is a purely mental exercise. There may be some computation or working out of illustrative cases but it's mostly glaring at the blackboard hoping a penny—or maybe a dime or a quarter—will drop. Patentable creativity is often much more experimental, more physical, than mathematics. It draws years of success and failure at the workbench and deep knowledge of how things really work.

As a consequence, one doesn't hear that inventors do their best work before thirty but one does hear from time to time that there is a sunset age for inventing, say 50 or 60 years of age. The generation looking toward retirement is not infrequently thought of (however silently) as being sufficiently abreast of the current frontiers of science and technology to invent. But what does the data say?

An analysis of the 7,236,657 U.S. patents granted in the 44 years from the beginning of 1976 to the end of 2019 reveals a pattern of inventive longevity rather than decline.

Keywords: inventor age, inventors over 50, patent analysis, senior inventors

Of the 3,896,190 inventors, 1,713,093 (44%) were granted more than one patent. Figure 1 is a histogram of the number of years between the first and the most recent patent (what we will call the *span* statistic) for these inventors

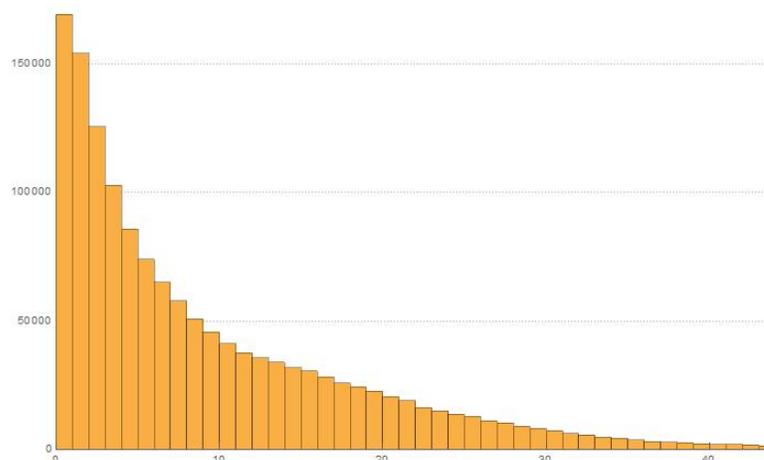


Figure 1: Years Between First and Most Recent Patent

Figure 2 shows the distribution of the span statistic for inventors who were granted more than 20 or 30 or 40 patents between 1976 and 2019.

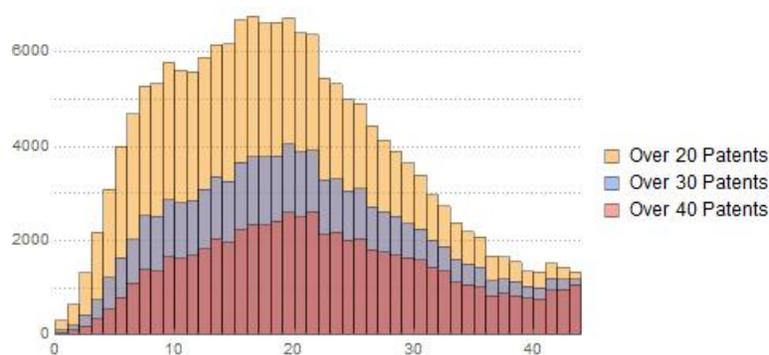


Figure 2: Years Between First and Most Recent Patent for Selected Inventors

Ben Jones has estimated that innovating in the U.S. starts at age 31.¹ If we wish to get a sense of the number of individuals receiving a patent after they were, say,

¹See Benjamin F. Jones, “Age and Great Invention”, NBER Working Paper 11359, May 2005,

50, then we might hypothesize that every inventor received their first patent at 31 and tally the number of individuals whose most recent patent is 19 years or more after their first patent. We will call the sum of 31 and the number of years after 1976 that a patent was issued the *proxy age* of the inventor at the time of the issuance.

Table 1 is a count of the number of inventors whose proxy age when they received their most recent patent was greater than four specific values.

Span	Proxy Age	Count	Percent
Over 19	Over 50	211,121	15%
Over 24	Over 55	117,239	8%
Over 29	Over 60	59,872	4%
Over 34	Over 65	27,317	2%

Table 1: Patent Span & Proxy Age at Most Recent Patent

Figure 3 shows the distribution of proxy age for all inventors whose proxy age is greater than 50 and of those those were granted at least 20 or 30 or 40 patents to date.

and Benjamin F. Jones, “The Burden of Knowledge and the ‘Death of the Renaissance Man’: Is Innovation Getting Harder?,” NBER Working Paper 11360, May 2005. In the former Jones writes “. . . the mean age at which innovators begin making active contributions has increased . . . from about 23 in 1900 to approximately 31 in the year 2000.”

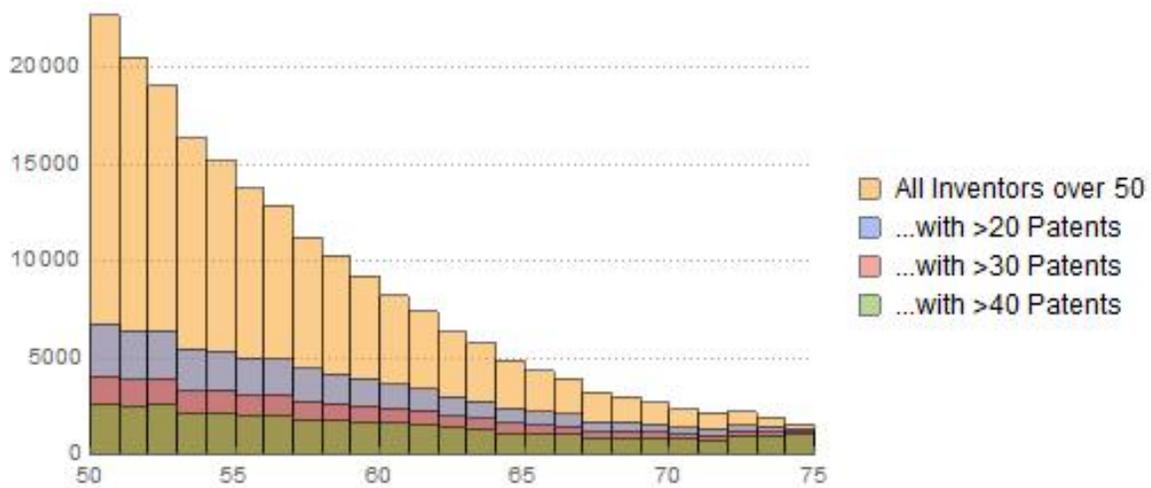


Figure 3: Proxy Age at Most Recent Patent

Methodology

The data sets used in this analysis are `inventor.tsv`, `patent_inventor.tsv`, and `patent.tsv` downloaded from www.patentsview.org on May 1, 2020. The data reflects patents granted through December 31, 2019. A data dictionary of these data sets is available [here](#).

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