

# Setting and Adjusting Patent Fees during Fiscal Year 2017— Description of Elasticity Estimates

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This document describes the statistical examination of the elasticity of patent user fees at the United States Patent and Trademark Office (USPTO). It summarizes the results of the analysis carried out during the January 2013 Setting and Adjusting Patent Fees Final Rule (referred to as the January 2013 Final Rule), provides a summary comparison of workloads estimated for the January 2013 Final Rule and actual workloads three years post-implementation, and provides detail on how elasticity was determined for the Setting and Adjusting Patent Fees during Fiscal Year 2017 Final Rule (referred to as the Final Rule).

## **Background**

Anticipated applicant behavior in response to fee changes is modeled using an economic measure known as elasticity, which for the purpose of this discussion measures how sensitive applicants and patentees are to changes in fee amounts. The higher the elasticity measure (in absolute value) the greater the applicant response to the relevant fee change. If elasticity is low enough (equivalently, demand is *inelastic* or the elasticity measure is less than one in absolute value), a fee increase will lead to only a relatively small decrease in patent activities, and overall revenues will still increase. Conversely, if elasticity is high enough (i.e., demand is *elastic* or the elasticity measure is greater than one in absolute value), a fee increase will lead to a relatively large decrease in patenting activities such that overall revenues will decrease.

Formally, elasticity ( $\epsilon$ ) is defined as the percentage change in the quantity demanded ( $Q$ ) divided by the percentage change in the price of the user fee ( $P$ ) that caused the quantity change:

$$\epsilon = \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}.$$

In this formula,  $Q_1$  and  $P_1$  refer to current quantity and price, and  $Q_2$  and  $P_2$  refer to the new quantity and price. Under this formula, because quantity decreases when price increases, and quantity increases when price decreases, elasticity will always be negative. Elasticity between 0 and -1 is called *inelastic* (meaning little or no change in quantity relative to price), and elasticity less than -1 is called *elastic* (meaning a greater change in quantity relative to price).

Once elasticity is known, one can directly estimate the impact of a price change on revenues.

For example, if it is known that elasticity is -0.5, then a 10.0% increase in the fee rate would lead to a 5.0% decrease in quantity. Since aggregate revenue is price (fee) multiplied by quantity (workload), revenue will change from the old revenue  $P_0Q_0$  to the new revenue  $P_1Q_1$ .

$$P_1Q_1 = P_0(1+10\%)Q_0(1-5\%) = P_0Q_0(1.1 \times 0.95) = P_0Q_0(1.045)$$

That is, at an elasticity of -0.5, a 10.0% fee increase leads to a 4.5% revenue increase.

The USPTO is a business-like operation where external factors affect the demand for patent products and services and the production of the workforce. When estimating incoming workloads, such as patent filings, the Office considers economic factors, overseas activity, court decisions, policies and legislation, process efficiencies, and anticipated applicant behavior.

Many of these factors, over which the USPTO has no control, can cause actual workloads to vary

significantly from estimates. Internal outputs can also be affected indirectly by these external factors.

As part of the January 2013 Final Rule, the Office estimated elasticity for the major patent services for which there were fee changes. As shown in the more detailed discussion below, the Office has seen variances between the 2013 estimated workloads associated with various products and services compared to the workloads realized in the years since the January 2013 Final Rule. At this point in time, four years post implementation of the January 2013 Final Rule, the elasticity estimates themselves cannot be isolated to be fully evaluated, but the differences between actuals and the estimated (the culmination of three effects – workload demand, prepayment of fees, and elasticity) fee workloads are identifiable in total.

As a result of an analysis of the differences between actuals and the estimated fee workloads, in the Final Rule, the Office is generally assuming that the final fee changes are not large enough to create a significant change in demand for existing products and services. While the Office is establishing some new fees that, in part, are designed to influence behavior (such as submissions of sequence listings of 300MB to 800MB, and sequence listings of more than 800MB), a fee elasticity analysis is not feasible for these new fees given that no fees are currently being charged for these services.

## **Elasticity Impact on Demand for USPTO Products and Services<sup>1</sup>**

### **Analysis of Efforts Supporting the January 2013 Final Rule, 1/18/13**

As noted above, as part of the January 2013 Final Rule, the Office estimated the elasticities for all major patent services experiencing fee changes. In the case of maintenance fee payments, a strategy was developed to estimate elasticity using publicly available data. In the case of pre-grant fee payments, the Office relied on reasonable estimates from economic theory.

The workload and fee collection estimates supporting the January 2013 Final Rule<sup>2</sup> were based on assumptions about the number of incoming patent applications, applicants' pre-paying prior to fee rate increases to avoid incurring a higher fee, and fee elasticity and the timing of the fee changes. This appendix reviews these assumptions as well as fees collected since the enactment of the January 2013 Final Rule. The USPTO fee and workload models used to create future projections are consistently updated as additional information is available, and this information was used for the Final Rule.

### **Workload Assumptions for the January 2013 Final Rule**

#### ***Utility, Plant, and Reissue (UPR) Filings***

First, when the Office set and adjusted fees in the January 2013 Final Rule, it assumed the planned patent UPR application filing and growth rates shown below. UPR filing estimates are important because applications coming into the Office are accompanied by both fees (filing, search and examination (FSE), as well as application size and excess claims fees, if warranted), and the associated workload (note that examiner hiring plans are dependent on current and estimated future filing levels and performance goals). The associated unexamined applications

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<sup>1</sup> The above results are based on the latest data available at the time of the publication of this document.

<sup>2</sup> The First Inventor to File rule changes occurred concurrently with the fee rate adjustments.

are also important because, as these applications go through the examination process, they represent potential future fee collections (e.g., through the payment of issue and maintenance fees). When estimating patent filings, the Office considers economic factors, overseas activity, court decisions, policies and legislation, process efficiencies, and anticipated applicant behavior. Many of these external factors can cause actual filings to vary significantly from estimates. For example, since January 2013, the Office witnessed a number of court decisions, such as *Alice Corp. v. CLS Bank International*, the downturn of economies in Europe, and a general lack of consensus among countries advocating effective intellectual property protection.

**Table 1. Utility, Plant and Reissue Patent Filings**

	Planned Filings	Planned Growth Rate	Actual Filings	Actual Growth Rate
FY 2013	558,884	5.0%	566,399	5.8%
FY 2014	586,828	5.0%	582,203	2.8%
FY 2015	616,169	5.0%	580,327	-0.3%

During the timeframe for this analysis, actual filing workloads fell short of the estimated 5.0 percent growth rate (shown in the table above) for FY 2014 and FY 2015.

### ***Prepayment***

Second, when estimating the impacts of the final fee schedule for 2013, the Office assumed applicants and patentees would modify when they would make fee payments in order to take advantage of the lower fee rates in place before the January 2013 Final Rule went into effect. Applicants and patentees have some flexibility in when they pay, especially with maintenance fees, and it was assumed that the sufficient notice of fee changes (i.e., 60 days) would result in the maximum possible amount of prepayment.

The Office estimated the maximum amount of prepayment to be two months of workload for application filings, extensions of time, appeals, and Patent Cooperation Treaty (PCT) fees and three months of workloads for maintenance fee payments. All of the estimates of prepayment, the amount of fees collected in advance of fee changes to take advantage of lower fee rates, were overestimated, as shown in the table below.

**Table 2. Variance Between Planned and Actual Prepayment**

(in millions)	Planned Prepayment	Actual Prepayment	Variance (\$)	Variance (%)
Patent Application Filing Fees	\$135.6	\$45.8	-\$89.8	-66.2%
Patent Maintenance Fees	\$245.2	\$207.6	-\$37.6	-15.3%
Patent Extension of Time Fees	\$32.9	\$0.9	-\$32.0	-97.3%
Patent Appeal Fees	\$11.8	\$0.2	-\$11.6	-98.3%
PCT Fees	\$28.7	\$0.3	-\$23.4	-81.5%

As seen in the table above, the Office overestimated the amount of prepayment for each of the major patent fee categories.

***Elasticity Estimates***

Third, the Office factored assumptions regarding fee elasticity into the analysis. At this point in time, four years post implementation of the January 2013 Final Rule, the elasticity estimates themselves cannot be isolated to be fully evaluated, but the differences between actuals and the forecasted (the culmination of multiple effects) workloads are identifiable. As a result of this analysis, the Office determined that, for the Final Rule, there are not any fee changes that are large enough to create a change in demand for products and services.

Following is a summary comparison of the original fee workload assumptions made for the January 2013 Final Rule and the actual findings four years after the implementation of the rule for several key patent fee categories.

#### Filing, Search, Examination, and Application Size

When determining an elasticity estimate in the January 2013 Final Rule, FSE fees, payment of which are mandatory to receive a patent (conditional on allowance), the Office determined a moderate, *inelastic* estimate for short term elasticity (FY 2013 and FY 2014), and a conservative, less elastic estimate for the long term (FY 2015 and beyond). The elasticity effect for FSE and application size workloads was estimated to be -1.3 percent for FY 2013, -2.7 percent for FY 2014, and -4.0 percent for FY 2015. Patent application filings, and subsequently, the search and examination of these applications, are affected by many factors, such as economic factors, overseas activity, court decisions, policies and legislation, process efficiencies, and anticipated applicant behavior. There is not enough data, at this time, to determine how much actual workload was affected solely by the increase to the fee rates versus these other factors. The following table displays the actual changes in fee workload.

**Table 3. FSE Changes in Workload**

	FY 2013 Growth Rate (over FY 2012)	FY 2013 Growth Rate (pre and post fee changes)	FY 2014 Growth Rate (over FY 2013)	FY 2015 Growth Rate (over FY 2014)
Filing	10.9%	-27.4%	-0.3%	-1.0%
Search	9.9%	-27.5%	-0.2%	-1.1%
Examination	8.1%	-27.6%	0.0%	-1.1%
Application Size	-2.0%	-23.3%	7.5%	2.9%

The table above shows both the year over year growth in fee workloads (fee collections divided by fee amount) and the change in fee workloads in FY 2013 before and after the fee changes that occurred on March 19, 2013 (January 2013 Final Rule). In FY 2013, the Office saw an overall annual growth of 10.9 percent in filing fee workloads (over FY 2012). Within the year, there was a 27.4 percent decrease in fee workloads after the January 2013 Final Rule fee change when compared to the days in the fiscal year prior to the fee changes. So, while there was growth in FY 2013, there was a shift in when applicants paid. While overall FSE fee workloads have not increased in the two years following the January 2013 Final Rule, the Office has not determined that fee changes are the cause. In the same time period, the Office has witnessed a number of court decisions, such as *Alice Corp. v. CLS Bank International*, the downturn of economies in Europe, a general lack of consensus among countries advocating effective intellectual property protection, and a first inventor to file rule change. The Office assumes each of the occurrences has influenced applicant behavior.

#### Excess Claims Fees

The Office predicted that non-mandatory fees would be more *elastic* than FSE fees. For example, excess claims fees, which are discretionary, are due for each independent claim in



excess of three and each claim (whether independent or dependent) in excess of twenty. As such, even if these non-mandatory fees are highly utilized by certain applicants for some types of applications, the Office considered these fees to be more *elastic* than FSE fees. But, because of difficulty ascertaining exactly how much higher the elasticity would be, the Office assumed a conservative mid-range, long-run elasticity estimate. The Office assumed that the impact takes place immediately (so that the short-run elasticity and long-run elasticity are both -0.30). The estimated elasticity effect for excess claims fee workloads was -3.3 percent for FY 2013, -6.6 percent for FY 2014, and -9.9 percent for FY 2015. The actual workloads, in the table below, show that applicants appear to be sensitive to increases in excess claims fee rates.

**Table 4. Excess Claims Changes in Workloads**

	FY 2013 Growth Rate (over FY 2012)	FY 2013 Growth Rate (pre and post fee changes)	FY 2014 Growth Rate (over FY 2013)	FY 2015 Growth Rate (over FY 2014)
Independent Claims in Excess of Three	-11.8%	-31.7%	-20.2%	-9.6%
Claims in Excess of 20	-7.1%	-40.2%	-18.7%	-8.9%

The table above shows both the year over year growth in excess claims fee workloads (fee collections divided by fee amount) and the change in workload in FY 2013 before and after the fee change. In FY 2013, the excess claims fee workloads had negative growth over FY 2012, which has continued in the following years. The FY 2013 decreases after the January 2013 Final Rule fee changes compared to the days in the fiscal year prior to the fee changes appear proportionately larger, but are influenced by patent application filing levels.

### Requests for Continued Examination

Section 4403 of the “American Inventors Protection Act of 1999” amended 35 U.S.C. § 132 to provide, at the request of the applicant, for continued examination of an application for a fee (request for continued examination or RCE practice), without requiring the applicant to file a continuing application under 37 CFR 1.53(b) or a continued prosecution application (CPA) under 37 CFR 1.53(d). To implement RCE practice, the Office has added 37 CFR 1.114 to provide a procedure under which an applicant may obtain continued examination of an application by filing a submission and paying a specified fee, even if the application is under a final rejection, appeal, or a notice of allowance. Prior to the implementation of the January 2013 Final Rule, there was only one RCE fee. Effective on March 19, 2013, two fees were put in place—one for First Requests and another, higher one for Second and Subsequent Requests.

For the January 2013 Final Rule fee adjustments, the USPTO estimated that, for FY 2013, FY 2014, and FY 2015, the elasticity effect on workloads for the first RCE would be -1.5 percent, -2.9 percent, and -4.4 percent respectively. RCEs are affected by many factors, such as examiner production, court decisions, and USPTO programs such as compact prosecution and enhanced quality that contribute to reducing RCEs. There is not enough data at this time to determine how much actual workload was affected solely by the increase to the fee rate. The actual fee workload changes are shown below.

**Table 5. RCE Changes in Workload**

	FY 2013 Growth Rate (over FY 2012)	FY 2013 Growth Rate (pre and post fee changes)	FY 2014 Growth Rate (over FY 2013)	FY 2015 Growth Rate (over FY 2014)
First RCE	-	-	3.4%	-11.1%
Second and Subsequent RCE	-	-	15.9%	14.1%
Total RCEs	4.2%	-24.1%	6.8%	-3.7%

The table above shows both the year over year growth in RCE fee workloads (fee collections divided by fee amount) and the change in workload in FY 2013 before and after the January 2013 Final Rule fee changes. In FY 2013, the Office saw a 4.2 percent total RCE workload growth over FY 2012. At the same time, there was a 24.1 percent decrease in fee workloads after the fee changes when compared to the days in the fiscal year prior to the fee changes. Some of this decrease is attributable to a change in payment timing and some of it is due to a shift from First RCE to Second and Subsequent RCEs. The Office has determined that a portion of the decrease to First RCEs in FY 2015 is attributable to outcomes from the *Alice Corp. v. CLS Bank International* court decision.

#### Appeal Fees

Every applicant, any of whose claims have been twice rejected, or any patent owner in an *ex parte* reexamination whose claims have been finally rejected may appeal the decision of the examiner to the Patent Trial and Appeal Board (PTAB) by filing a notice of appeal accompanied by the required fee and within the time period prescribed for reply. For FY 2013, the elasticity effects for *ex parte* appeal fee workloads, specifically the Notice of Appeal and Forwarding an Appeal fees, were both -5.0 percent; and for FYs 2014 and 2015, they were both estimated to be -10.0 percent.

The January 2013 Final Rule altered the process for which *ex parte* appeal fees were charged. Prior to the fee changes, an applicant would pay a fee along with a Notice of Appeal. An applicant would then have the choice to pay to file a brief. After the changes set forth in the January 2013 Final Rule, an applicant continues to pay a fee with a Notice of Appeal, but the filing of a brief does not require the payment of a fee. After the appeal is reviewed, and if an examiner decides not to reopen prosecution, an applicant must pay a fee to then forward the appeal to the Board.

At this point in time, the elasticity estimates themselves cannot be fully evaluated especially given the procedural changes that occurred simultaneously with the fee changes. However, the differences between the actuals to the forecasted (the culmination of multiple effects) workloads are identifiable. The actual change in Notice of Appeal and Forwarding an Appeal workloads in FY 2013 before and after the January 2013 Final Rule can be seen below.

**Table 6. *Ex Parte* Appeal Changes in Workload**

	FY 2013 Growth Rate (over FY 2012)	FY 2013 Growth Rate (pre and post fee changes)	FY 2014 Growth Rate (over FY 2013)	FY 2015 Growth Rate (over FY 2014)
Filing a Notice of Appeal	-9.0%	-5.5%	5.2%	-7.0%
Forwarding and Appeal	-	-	271.4%	-16.3%

The table above shows both the year over year growth in *ex parte* appeal fee workloads (fee collections divided by fee amount) and the change in workload in FY 2013 before and after the January 2013 Final Rule fee changes. In FY 2013, the Office saw a 9.0 percent total *ex parte*

appeal workload decrease over FY 2012. At the same time, there was a 5.5 percent decrease in fee workloads after the fee changes when compared to the days in the fiscal year prior to the fee changes. There was only a small amount of difference in workloads pre and post fee change. This is because applicants do not have a lot of flexibility in timing *ex parte* appeals.

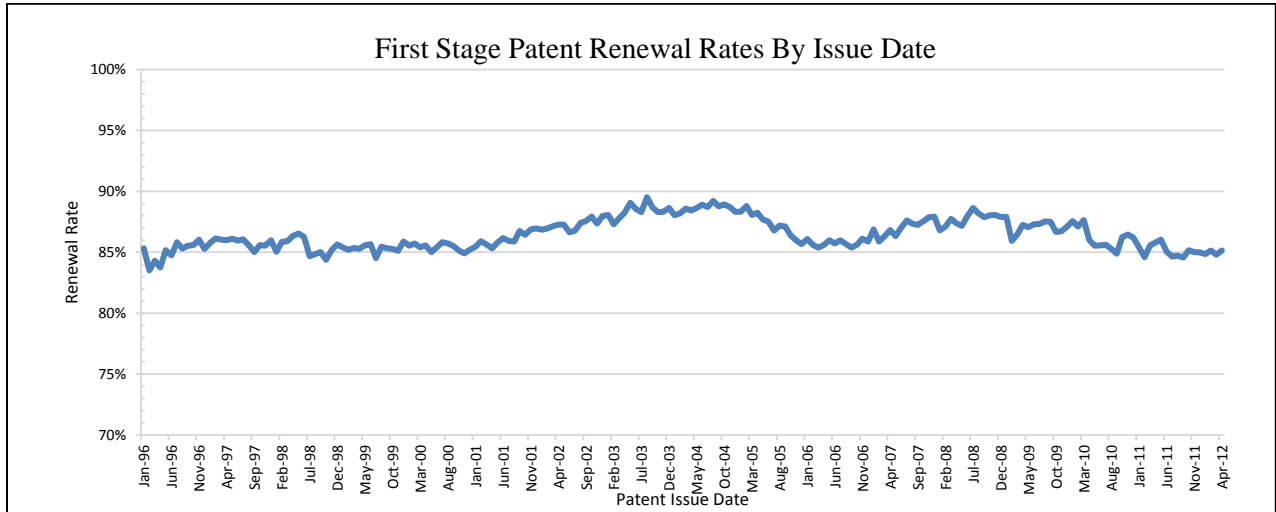
Maintenance Fees

Patent renewal maintenance fees are due at three points following patent issuance: 3½ years; 7½ years; and 11 ½ years to continue patent protection. In preparation for the January 2013 Final Rule, historical renewal rates of patents were examined from the time period maintenance fees were first implemented. To estimate elasticities, the Office analyzed the extent to which maintenance fee changes affected renewal rates. Regression analysis was used to construct elasticity. For all regressions, maintenance fees were found to be negatively correlated with the probability of renewing the patent. Larger price increases were associated with larger elasticities; however, all elasticities remained within the inelastic range. Further, elasticity was shown to be highest at the second renewal period and lowest at the first renewal period. Elasticity effects on fee workloads for the January 2013 Final Rule are shown on the table below.

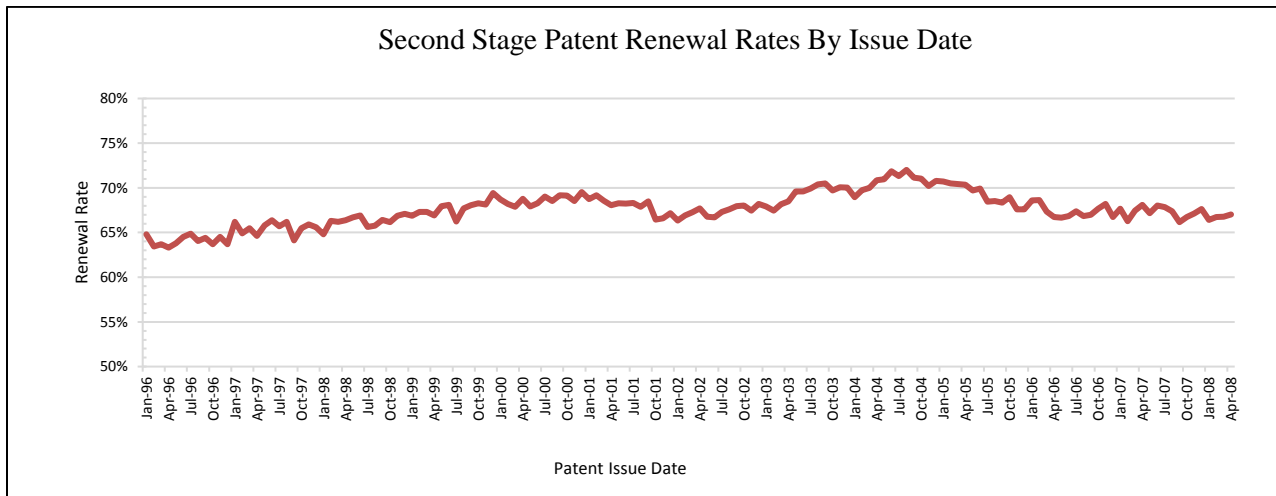
**Table 7. FY 2013 Maintenance Fee Elasticity Effects on Workloads**

	FY 2013	FY 2014	FY 2015
First Stage	2.2%	4.3%	4.7%
Second Stage	2.2%	4.3%	4.6%
Third Stage	4.8%	9.7%	10.2%

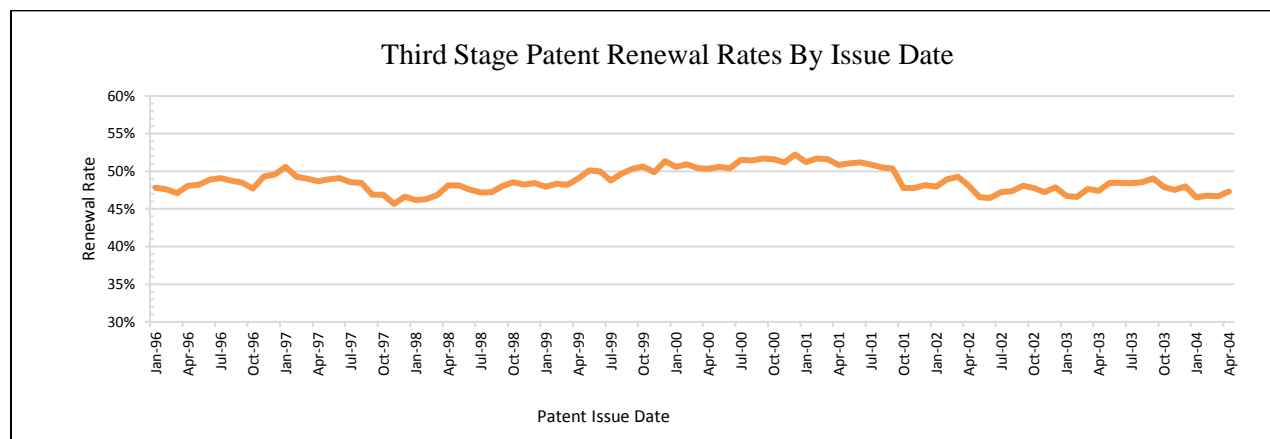
When analyzing patent renewal rates (which are based on the patents' issue dates), the Office has not seen significant changes in renewal rates as a result of the increase in patent maintenance fee amounts.



First stage patent renewal rates have been between 89.5 percent and 83.5 percent for those issued since 1996. Renewal rates in the last three years average 85.9 percent.



Second stage patent renewal rates vary more and are the most price sensitive of the maintenance stages. For those issued since 1996 second stage renewal rates varied between 63.3 percent and 72.0 percent. Renewal rates in the last three years average 67.8 percent.



Third stage patent renewal rates have been between 45.7 percent and 52.2 percent for those issued since 1996. Renewal rates in the last three years average 48.1 percent.

### Summary of Analysis Supporting the Final Rule

The Office analyzed the fee rate changes in the Final Rule and determined that there are not any fee changes great enough to create a significant change in demand for products and services.

Although there is not enough data to independently determine exactly how responsive applicants are to USPTO fees, there is no definitive evidence indicating that any of the fee changes would cause any more than an incremental change in applicant or patentee behavior.