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Competition and Quality in the Notary Profession

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Abstract in English

The 1999 Dutch Notary Act has initiated an ambitious deregulation process in the market for notary services in the Netherlands. We evaluate the impact of this liberalisation policy on (i) the level of competition in the profession and (ii) the quality of services. We compare the level of competition before and after the liberalisation using two different indicators, namely a relative-profit indicator and a variation of the Bresnahan-Reiss indicator. Using the relative profit indicator, we find that the level of competition has increased after 1999. We find, however, no significant difference between the level of competition in 1996 and in 2002. This is particularly clear when we measure competition taking the local market as the relevant market for notary services. The results on the national market are more mixed and there is some evidence that competition in 2002 is higher than in 1996. Using the Bresnahan-Reiss indicator, we find that entry does affect conduct in the notary market, but again that the level of competition in the local market for notary services in 2003 does not significantly differ from the 1995 level. We also examine whether competition affects the quality of notary services. We use both subjective and objective measures for quality of notary services. We find that subjective quality - the perceived level of service by clients - is, if anything, negatively affected by competition. Using objective quality, i.e. quality that is not observable to clients, we find that in 2003 competition leads to a deterioration of quality, as the quality of monopoly notaries outperforms the quality of oligopoly notaries. This was not the case in 1995. Confronting our empirical findings with qualitative insights, we present options for policy.

Key words: Notary, Competition, Quality, Legal Service
JEL code: L11, L15, L69

Abstract in Dutch

De wet op het notarisambt uit 1999 heeft een ambitieuze deregulering in de markt voor notarisdiensten doorgevoerd. We beoordelen het effect van de liberalisering van de notarismarkt op (i) het niveau van concurrentie binnen de beroepsgroep en (ii) de kwaliteit van de diensten. We vergelijken het niveau van concurrentie voor en na de liberalisatie met behulp van twee verschillende indicatoren, namelijk een relatieve winstindicator en een variant van de Bresnahan-Reiss indicator. De relatieve winstindicator laat zien dat het niveau van concurrentie toeneemt na 1999. We vinden echter geen significant verschil tussen het niveau van concurrentie in 1996 en in 2002. Wanneer we de hele Nederlandse markt als relevante markt nemen, dan is het beeld minder eenduidig. Er lijkt sprake van een toename van concurrentie. De Bresnahan en Reiss indicator laat zien dat toetreding op de notarismarkt wel tot een toename van concurrentie leidt, maar dat, net zoals met de relatieve winst indicator, er geen significant

verschil is tussen het niveau van concurrentie in 1995 en dat in 2002. We onderzoeken ook of concurrentie een positief of negatief effect op kwaliteit heeft. We kijken naar de subjectieve en objectieve dimensie van kwaliteit van notarisdiensten. We vinden dat subjectieve kwaliteit - het oordeel van klanten - eerder slechter is in een concurrerende markt dan beter. Voor objectieve kwaliteit, in dit geval kwaliteit die niet zichtbaar is voor de consument, vinden we dat in 2003 concurrentie tot lagere kwaliteit leidt. Monopolie notarissen presteren beter dan oligopolie notarissen. Dit was niet het geval in 1995. Een confrontatie tussen onze kwalitatieve en empirische bevindingen leidt tot beleidsopties.

Contents

Preface

The European Commission has recently voiced concern about the low level of competition in the notary profession in Europe. In 1999, the Netherlands pioneered an important deregulation of the notary profession through the enforcement of a new Notary Act. This act liberalised prices and facilitated entry in the profession. As a result, the Dutch notary profession has become one of the least regulated in Europe. The objectives of the 1999 Dutch Notary Act were 1) to increase competition and therewith to lower prices and 2) to increase or at least maintain the quality of services. This study evaluates whether the Act has achieved these objectives.

This report is part of an ongoing research project on competition in professional services which is partly carried out in collaboration with Catherine Schaumans and Frank Verboven from the KU Leuven. We gratefully acknowledge their guidance through this research and their comments on a draft version of this report. Part of the present study will be used later in jointly authored work. Ali Aouragh provided excellent research assistance with the econometric analysis. Jeannette Verbruggen painstakingly built up several of the core datasets for this study and carefully controlled data sets from other sources. Harold Creusen shared his knowledge on estimating the relative-profit measure of competition.

At the time of publication of this report, a companion report entitled 'Liberalisation of the Dutch notary profession: Reviewing its scope and impact' by Nicole Kuijpers, Joëlle Noailly and Ben Vollaard also appears. This report provides a detailed overview of the institutional rules, the making of the new law and existing reviews of the new law.

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Henk Don, director of the CPB

Summary

This study investigates the effects of the deregulation policy introduced at the end of the 1990s in the Dutch notary profession. The deregulation process enforced in 1999 by the new Notary Act removed price fixing and relieved entry requirements. As a result, the Dutch notary profession has become one of the least regulated in Europe.

The objectives of the 1999 Dutch Notary Act were twofold: 1) to increase competition and therewith efficiency so that consumers could benefit from lower prices and 2) to increase or at least maintain the high quality of the notary services. This study aims to assess the impact of the 1999 Notary Act on competition and quality. More precisely, our research question is: *What are the consequences of the 1999 Notary Act on the level of competition within the profession and on the quality of notary services?* We make use of both qualitative and quantitative insights, although the core of the analysis is mainly empirical.

Qualitative analysis

In chapter 2, we present an institutional analysis of the Dutch notary profession. We present the main reforms enforced by the 1999 Notary Act. Our main findings are that the deregulation process enforced since 1999 is a promising step towards a more competitive market, although several institutional barriers that may hinder competition are still in place.

The Notary Act greatly facilitated entry in the profession, notably by abolishing the maximum on the number of notaries, and liberalising prices (fully in the second half of 2003). There remain, however, several institutional obstacles that may have a negative impact on competition 1) the introduction of a mandatory check on the business plan before opening a new office limits entry and 2) the interdiction to specialise at the office level (the so-called 'ministerieplicht') has not been challenged. The fact that an office must offer full services makes it more difficult for junior notaries to open a solitary office as it requires a broader knowledge on all types of services. In addition, the 'ministerieplicht' has little motivation in a market with liberalised prices, as a notary can still implicitly specialise by charging a very high price for the services he does not want to provide. Further trends in the notary market show that the actual entry of new notaries in recent years has been very limited. In addition, the scale of notaries' offices has increased over the years. This evolution is a possible consequence of the Notary Act. With more competition and thus more uncertainty in the market, junior notaries prefer to join existing offices rather than starting new practices. This trend, however, may mitigate the expected increase in competition. Regarding quality, the Notary Act reinforced the existing professional standard. The Notary Act mainly reorganised of the jurisdictions on quality control. The authority on financial regulation (Bureau Financieel Toezicht, BFT) was created to guarantee the solvency of notaries. The role of the Royal Dutch Notarial Society (Koninklijk Notariële Beroepsgroep, KNB) on quality has also been reinforced.

In chapter 3, we present an economic interpretation of the market for notary services using insights from economic theory. This analysis teaches us that quality regulation is justified in the notary market. The presence of two main market failures - information asymmetry and externalities- explains that a notary will always have incentives to provide suboptimal quality. Market mechanisms, like reputation and liability, do not work sufficiently well to solve these issues. Therefore, minimum quality standards are required to maintain quality. Rules to guarantee the continuity of notary services, in the case of bankruptcy for instance, are also desirable. Obviously, guarantying the continuity of services does not mean that bankruptcy should be avoided at all costs, as this is at odds with a liberalised market. Regarding the effect of competition on quality, the expected impact of competition on observable quality is positive, that on other dimensions of quality is ambiguous.

Measuring competition

In chapter 4, we empirically measure the level of competition before and after the enforcement of the 1999 Notary Act in two distinct relevant markets: 1) the local market, which we can loosely interpret as the market for the individual consumer, i.e. the market for family services and small scale real estate transactions and 2) the national market, which we can loosely interpret as the market for professional consumers, i.e. the market for corporate services and large scale real estate transactions. The major result of our empirical analysis is that competition has increased after the implementation of the 1999 Notary Act, but to a level that is not significantly different from that in 1996. Indeed, we find no significant increase in the level of competition four years before and after the policy reform. This is particularly clear for the level of competition in the local market. In the national market, our results are more mixed, depending on the estimation procedure we use. There is some evidence that the level of competition in the national market is significantly higher in 2002 than in 1996. Overall, there are concerns that the local market has experienced less variation in competition after 1999 than the national market.

In our analysis, we use two distinct indicators to measure competition. We first use a relative-profit indicator (Boone, 2004), which uses the fact that an increase in competition rewards efficient firms by increasing their performance. To construct this indicator, we use firm-level data on gross profits and variable costs for a sample of notary offices over the 1996-2003 period. Our second indicator is a variation of the method developed by Bresnahan and Reiss (1990, 1991). This indicator measures by how much profit margins (using market size as a proxy) decrease as a new competing office enters the market, assuming that the market is intrinsically local. We use cross-sectional data on the geographical distribution of notaries to estimate the level of competition at two different points in time; in 1995 and 2003.

With the relative profit indicator we can infer the evolution of competition over the years. We find that competition has increased after 1999, but that this increase just cancels out a drop in competition observed between 1996 and 1999. As a result, in the local markets the level of

competition in 2002 is about the same as the level of competition in 1996. In the national market, one of our estimation procedures shows that the level of competition in 2002 is significantly higher than in 1996. In addition, we find that, while competition is more intense at the local level than at the national one, the increase in competition after 1999 has been more important on the national market than on the local market. The Bresnahan and Reiss indicator shows results similar to the relative profit indicator on the local market.

Assessing the impact of competition on the quality of notary services

In chapter 5, we measure the impact of competition on the quality of notary services. We find that concerns about the effect of competition on quality tend to be justified, as our results show that competition leads to a deterioration of quality.

In our empirical analysis, we look at two different aspects of quality, namely: 1) the quality that is observable by consumers, i.e. service satisfaction as measured in consumer surveys 2) the quality that is not observable by consumers, i.e. the number of corrections in notary acts at the Land Registry. Quality is a multidimensional issue of which we can only capture those facets for which we have measurable proxies. For both types of quality, we empirically compare the quality of monopoly and oligopoly notary markets. We have data from the Land Registry for the years 1995 and 2003. Consumer surveys, however, were conducted only after the 1999 Notary Act so we use the last available year (2002).

Using subjective quality measures, namely the quality perceived by consumers, we find that competition did not have the expected positive impact on quality. If anything, competition has a negative effect on quality, notably on the 'service/friendliness' and 'time to proceed the transaction' dimensions. Using data on non-observable quality, we find that in 2003 (1995) notaries' offices in competitive markets provide lower (higher) quality than monopoly offices.

Interpretation and policy suggestions

In our interpretation, we must keep in mind that the effects of the 1999 Notary Act may not have been fully realised yet. In our empirical analysis on the level of competition, our most recent data are from January 2003, while the full price liberalisation in the notary market was only achieved in the second half of 2003. In addition, the (legal) quality of notary services has many dimensions that we cannot capture all with our indicators. With these clarifications in mind, we come with suggestions for policy.

Our analysis suggests that there is room for more competition in the market. However, we also find evidence that competition might deteriorate quality. The decision to give more weight to one of the aspects - competition or quality - is by and large a political choice. Here, we present policy options that stimulate competition and enhance or at least maintain the incentives to provide high-quality services.

First, it is obvious from our analysis that entry has been sluggish; therefore we present the following options to stimulate entry:

1. A policy option is to abolish the business plan requirement and to intensify financial supervision by the Bureau Financieel Toezicht in the first year(s) of a new office. An alternative is to examine the working of the commission that evaluates the plans, in order to guarantee that the procedure is not acting as a barrier to entry. The fact that a committee evaluates the establishment of a new notary practice may hinder entry in the market. There is some evidence that junior notaries perceive it as a barrier. The primary motivation for this additional check on the business plan is to prevent too many bankruptcies among notary offices, which in turn could damage the trust that the public puts in the notary. There is thus a trade-off between a possible damage of trust and an entry barrier. Therefore, the role of the business plan could be re-evaluated.
2. Another policy option is to abolish the 'ministerieplicht' but at the same time to maintain educational demands and improve quality supervision. The 'ministerieplicht', i.e. the fact that each notary office has to offer full services, also tends to limit entry (and is experienced as such by candidates). *De facto* the ministerieplicht is not effective in banning specialisation, as notaries are free to price their services. Notaries can thus enter the market and then set a very high price for the service they do not want to provide. However, surveys among junior notaries show that candidates perceive the ministerieplicht as a barrier. Candidates still feel that it is easier in practice to open a new office that is specialised in a few services because it requires a less broad knowledge. The motivation for the 'ministerieplicht' is that specialisation leads to fragmented knowledge and hence to suboptimal advice in the cases where there are complementaries between the services, that is when knowledge across fields is necessary. It is questionable, however, whether ten years of education are not sufficient to acquire this broad knowledge. On the other hand, specialisation generally leads to better quality if there are no substantial complementarities and specialisation tends to favour entry.

We do not consider more drastic policies to stimulate entry in the profession. First, these might damage the quality of the service. Second, shaking up the industry more considerably would increase uncertainty and might thereby make notaries more hesitant to enter. This holds to a lesser extent for the following suggestions, as these affect incumbents directly:

1. Making the consumers aware that it is possible, if the notary agrees, to sign a contract without actually being present in person at the office. At the same time consumers should be made aware of the possible costs in terms of quality that this implies. Allowing notaries to offer 'digital' services for some of the most standard transactions would make customers more willing to use the services of a cheaper notary outside their city or local market.
2. Allowing notaries to provide their services outside their district on a permanent basis. For now, current regulation only allows the notary to provide his services outside his district if this has an 'incidental' character.

We also discuss the following options to enhance quality in the notary market:

Given the current concern for quality, there seems to be no reason to challenge neither the professional monopoly of notaries or the professional quality standards currently in place (education and training requirements). Instead, professional standards appear to be justified by the presence of market failures, namely information asymmetry and external effects.

- Given that it is difficult to assess all relevant dimensions of quality of the notary product, measures of 'naming and shaming' do not seem appropriate to enhance the quality of notary services.
- The KNB (or some other institution) could play a role in raising consumer awareness of what quality of a notary entails. For instance, the KNB could provide a check list to the consumer on how to evaluate the quality of the notary services.
- Further enhancement of quality control seems welcome. The exact form of this quality control is beyond the scope of our research, but nowadays quality control seems rather fragmented. Hence an independent authority that controls the production process could help to serve as quality safeguards.
- An option to limit bankruptcy could be to control the financial situation of notaries and to implement rules that guarantee the solvency and continuity of notary services when the notary gets bankrupt. This process could be implemented in a more efficient way if the authority for financial supervision (Bureau Financieel Toezicht) would be given more authority, for instance on filing complaints.
- As stated above, quality could benefit from the abolishment of the 'ministerieplicht' and the authorisation of specialised offices, at the condition that education requirements are maintained and that quality supervision is improved (in order to preserve the quality of complementary services).

1 Introduction

This study investigates the effects of the deregulation policy enforced at the end of the 1990s in the Dutch notary profession. In the Netherlands, as in most European countries, the notary profession is organised in the Latin notary system.[1] The main task of the Latin notary is to authenticate and control the legal validity of transactions, such as wills, marriages, establishment of companies and real estate transactions. Due to the important role of the notary in the legal structure of the country, the profession is subject to regulation by the public authorities with specific rules on appointment and education.

In recent years, the European Commission has voiced concern about the low level of competition within professional services.[2] The recommendations by the Commission suggest eliminating all restrictive and unjustified regulations that may hinder competition in these services. Since 1994, the Dutch government introduced a series of initiatives to deregulate professional services, i.e. the so-called MDW (Marktwerking, Deregulering and Wetgeving) projects. In the notary profession, these initiatives paved the road towards a new Dutch Notary Act in 1999.[3] The deregulation process removed price fixing and relieved entry requirements. As a result, the Dutch notary profession has become one of the least regulated in Europe and Dutch customers can nowadays directly compare prices of notary services on the internet.[4]

The objectives of the 1999 Dutch Notary Act were twofold: 1) to increase competition and therewith efficiency so that consumers could benefit from lower prices and 2) to increase or at least maintain the high quality of the notary services. Monitoring in the years that followed the deregulation shows that entry of new notaries has remained limited; prices have decreased for large real estate transactions and increased for family services and small real estate transactions; and there are indications that the quality of services deteriorated (Commissie Monitoring Notariaat, 2003).

This study aims to assess the impacts of the 1999 Notary Act on competition and quality. More precisely, our research question is: What are the consequences of the 1999 Notary Act on the level of competition within the profession and on the quality of notary services?

Although we briefly present qualitative and theoretical results, the core of our analysis is empirical. The 1999 Notary Act provides us with a quasi-experiment allowing us to quantitatively compare the level of competition before and after the liberalisation. This paper is,

[1] The Latin system includes Germany, France, Italy, Spain, Belgium, the Netherlands, Luxembourg, part of Switzerland, Portugal, Austria and most Latin-American countries. The Latin notary system contrasts with the 'notary public' institution that prevails in Anglo-Saxon countries. The main difference between the two systems rests in the status of the professional. In the Latin system, the notary is a professional lawyer, while a 'notary public' holds more of a clerical position. The notary public is not involved with legal issues and his role is only to certify the identities of the signees. A comparative analysis of the two systems can be found in Malavet (1996).

[2] The professional services pointed out by the European Commission were lawyers, notaries, accountants, architects, engineers and pharmacists (European Commission, 2004).

[3] Formally, the deregulation of the notary profession was not part of the MDW operation.

[4] Since 2000, the site www.degoedkoopstenotaris.nl allows consumers to compare prices for about 60% of the notary offices.

to our awareness, the first that empirically assesses competition in the notary profession. We use two complementary indicators to measure competition. We first use a relative-profit indicator (Boone, 2004) to measure competition in two distinct relevant markets for notary services, namely the national market and the local market (that is defined at the city level). This indicator makes use of the fact that an increase in competition rewards efficient firms relatively more than less efficient ones by increasing their performance. We can thus use performance differences to capture efficiency differences. To construct this indicator, we use firm-level data on gross profits and variables costs for a sample of notary offices over the 1996-2003 period. Our second indicator is a variation of the method developed by Bresnahan and Reiss (1990, 1991). This indicator measures by how much profit margins (using market size as a proxy) decrease as a new competing office enters the market, assuming that the market is intrinsically local. We use cross-sectional data on the geographical distribution of notaries to estimate the level of competition at two different points in time, in 1995 and 2003.

With the relative profit indicator we can infer on evolution of competition over the years. We find that competition has increased after 1999, but that this increase by and large cancels out a drop in competition observed between 1996 and 1999. So, the level of competition in 2002 is about the same as the level of competition in 1996. This is very clear on the local market. Our results on the national market are more mixed depending on the estimation procedure we use. There is evidence that in 2002 competition in the national market was significantly higher than in 1996. In addition, we find that, while competition is more intense at the local level than at the national one, the increase in competition after 1999 has been more important on the national market than on the local market. The results of the Bresnahan and Reiss indicator show similar results than the relative profit indicator on the local market. Overall, there has been an increase in competition since 1999. The individual consumer seems to have benefited less from this increase than the professional consumer.

Regarding the impact of the 1999 Notary Act on the quality of services, we look at two different aspects of quality, namely: 1) the quality that is observable by consumers, i.e. service satisfaction as measured in consumer surveys, and 2) the quality that is not observable by consumers, i.e. the number of corrections in notary acts at the Land Registry. For both types of quality, we compare empirically the quality of monopoly and oligopoly notary markets. We use data from the Land Registry for the years 1995 and 2003. Consumers surveys, however, were conducted only after the 1999 Notary Act so we use the last available year (2002).

Using subjective/observable quality measures, namely the quality perceived by consumers, we do not find the expected result that competition increases quality. If anything, competition decrease quality, especially on the ‘service/friendliness’ and ‘time to proceed the transaction’ dimensions. Using data on non-observable quality, we find that in 2003 (1995) notaries’ offices in competitive markets provide lower (higher) quality than monopoly offices. This finding suggests that quality deteriorated more, due to the new Act, in competitive markets than in monopoly ones. Our study is organised as follows. Section 2 describes the institutional

organisation of the Dutch notary profession and explains the main developments enforced by the 1999 Dutch Notary Act. Section 3 presents some theoretical insights on why regulation is justified in the notary profession and on the expected impact of increasing competition on quality. Section 4 presents our findings on the measure of competition using the relative profit and entry thresholds indicators, respectively. Section 5 presents the empirical results on the quality-competition relationship. Section 6 summarises our key findings and gives directions for policy.

2 Institutional background

In this chapter, we introduce the organisation and regulation of the notary profession in the Netherlands. We focus on the activities of notaries, changes in the regulatory framework related to the new Notary Act of 1999, and developments in the profession since the introduction of the new Act. Our presentation will be brief. An extensive description of the institutions of the notary profession can be found in the background report to this study, Kuijpers et al. (2005). The aim of this chapter is to provide qualitative insights in the interplay between current institutions and competition and quality in the notary market.

2.1 Key characteristics of the Dutch notary

In 2004, the Dutch notary profession counts 1440 notaries and 2061 junior notaries working in 891 offices. The Dutch notaries are organised in the Royal Dutch Notarial Society (Koninklijke Notariële Beroepsorganisatie, KNB) whose origins date back to 1843. Table 2.1 provides some key statistics on the Dutch notary profession.

Table 2.1 Main economic indicators of the notary sector, 2001

Number of firms[a]	707
Employed labour force[b]	10351
Average number of employees per firm	15
Labour costs as percentage of total costs	63
Profit before taxes (mln euro)	218
Production (mln euro)	716
Production value as percentage of GDP	0.17

Source: CBS Statline, SBI-code: 7411.3
[a] A firm can have multiple offices.
[b] Of which 8,969 are salaried employees.

As typical of the Latin notary within the system of Civil Law, the Dutch notary is a lawyer, i.e. he is a professional who is entitled to practice law. His function differs, however, from the traditional 'court-lawyer' (or 'attorney-at-law') who represents the interest of his client in front of the court. Instead, the notary is a specialised 'contract-lawyer'. He is the only lawyer who has the authority to draft official documents.

The notary holds a 'professional monopoly' on three types of services: 1) family services (drawing up wills, marriage contracts, and donations); 2) real estate services (conveying real property, creating and altering mortgages); and 3) corporate services (establishing public and private limited liability companies). For these transactions, notarisation is mandatory; the consumer has no other choice than to go to a notary to make these contracts official. Finally, the notary is obliged by law to offer the full range of services within an office. In Dutch, this is called the 'ministerieplicht'.

The central role of the notary is to control the legal validity of the transaction. The notary fulfils a public function in the sense that he provides legal certainty and security into the legal structure of the society. Thus the notary ensures that contracts are properly arranged. If this was not the case, it could affect other legal procedures and hinder economic transactions. Entrepreneurs, for instance, would be less willing to invest if they were not confident that the transactions are in proper order.

Once a notary has controlled the contents and sealed a document, the transaction becomes automatically legal. They do not need to be validated in another legal way. Thus the notary exerts some form of executorial power on contractual issues, which is in some sense comparable to the power of a judge. Just like the judge, the notary must remain impartial and independent. The notary must not only defend the interests of his clients but also the interests of third parties that may be involved in the transaction.

Finally, another particularity of the notary is that, unlike the judge, the notary is an entrepreneur and not a civil-servant. He holds a certain 'hybrid' position.

2.2 Regulation of the Dutch notary profession

In this section, we sketch the current regulatory framework of the notary profession in the Netherlands. We review the new regulations established by the 1999 Notary Act and present the current regulations on quality control and advertising.

Motivation and objectives of the 1999 Notary Act

Up to 1999 the Dutch notary profession was regulated according to the rules laid down in the Notary Act of 1842 and through self-regulation by the code of conduct of the KNB. The need for a new Notary Act was stimulated by the large process of deregulation of the Dutch economy initiated by the Dutch Competition Act of 1987.

The introduction of competition in the notary profession was at the core of many debates in the Dutch Parliament between 1994 and 1998. The main issues of discontent under the old Notary Act were: (1) regulated fees had no relation to costs and notaries were making high profits as a consequence, and (2) consumers had little freedom of choice since prices were fixed and quality was hardly observable. The new Act aimed to pave the road towards better acceptable fees, while maintaining equitable access to notary services and supporting the high professional standards of notaries.

A Notary Bill drafted by the Minister of Justice met stiff opposition from the KNB. First, the professional organisation feared that the introduction of free fees would undermine the independence of the notary. With free rates, the notary would have to 'please' clients when negotiating prices after all. Second, the KNB was concerned that the liberalisation would lead to a deterioration of quality. They referred to the experiences in Quebec. In Quebec, liberalisation resulted in a dramatic drop in notary fees accompanied with a strong increase in the number of

claims related to professional liability. Apparently, notaries were tempted to cut on costly quality checks in order to compensate for lower incomes.

Finally, another matter of concern for the KNB was that with free rates the prices for family services would increase due to the end of cross-subsidisation of family services with earnings from real estate services. This would make family services less accessible for low-income households.

Appointment

In the Netherlands, a notary is appointed by the Crown under the supervision of the Ministry of Justice. To become a junior notary, one has to be a law graduate, specialised in notary law. Under the old Notary Act, the junior notary had to follow a three-year work placement at a notary's office after his studies before he could be appointed as a notary. The 1999 Dutch Notary Act added three main requirements:

1. Duration of the work placement is doubled from 3 to 6 years
2. Professional training of the KNB for junior notaries is made mandatory
3. Before opening a new office the junior notary has to submit a business plan, which has to be approved by a special committee.

In fact, the prolongation of the professional training is just an adaptation to what happened in practice. Before the new Act, it was not unusual for a junior notary to have to wait ten years before getting a notary position. Similarly, although the professional training from the KNB was optional, in practice most junior notaries received it.[5]

The main innovation is the business plan. Before a junior notary can be appointed he has to show that his future practice can be cost-effective within three years. A committee of financial, economic and notary experts has to approve the business plan. Notaries constitute a minority in the committee in order to safeguard the impartiality of the committee. In 2003, 116 business plans were submitted, of which 111 were approved. Only one business plan was disapproved, the other four were withdrawn. Surveys among junior notaries, however, show that junior notaries are not very positive about the business plan and still perceive it as an obstacle to open a new office (Commissie Monitoring Notariaat, 2004).

With the introduction of the new Notary Act, the number of notaries is no longer capped. In the first four years after the new Act came into force the increase in the number of notaries was capped at 10 percent per year. In 2003, this last restriction was also abolished.

[5] In addition, the length of studies has been shortened to 4 years due to the implementation of the BAMA structure at universities. The KNB justifies the lengthening of the training period by the fact that the BAMA structure favors general knowledge over specialised knowledge in notary law.

Establishment policy

The new Notary Act greatly facilitated the establishment of new notary practices. In theory, every junior notary that meets the requirements for appointment can open a new notary office.

Under the old Act, the Crown ruled on the maximum number of notaries per district. These conditions aimed to prevent that there would be a surplus of notaries in the big cities and a shortage in the countryside. A junior notary could only be appointed if there was a vacancy. A special committee created by the KNB used to evaluate whether a new post was needed on the basis of criteria such as: the number of inhabitants in the market, the number of notary deeds that were drafted and the returns of the notaries already in place. In that system a vacancy could occur only if a notary ceased his activities or if there was a need for a new notary in a specific office or location.

From 1999 on the notary is free to establish a practice in any place he wants at the condition that his business plan has been accepted. The way in which the business plan is evaluated leads to an establishment policy that is not completely free. Ultimately, the committee of experts judges whether the market, in which the notary wants to establish, is sufficiently large or not. This is to prevent notaries to go bankrupt. In practice, this means that the notary cannot freely establish an office at the location of choice.

Under the old Act, the notary could only offer his services in his own district and was obliged to live and run his office at the same address. Under the new Act, the notary is allowed to offer his services outside his district, provided that these activities have an incidental character. He is also no longer obliged to live in the place of establishment. This means that the attractiveness of a place as a residence no longer plays a role in the decision to open an office in a given locality.

The customer can ask not to be present during the authentification of the transaction at the condition that the notary agrees with this request. The notary himself, however, is not allowed to propose to the customer not to be present. The motivation behind this rule is to prevent that the notary proposes cheaper services with less advice (and thus lower quality) when the customer does not have to be present.

Prices

Under the Old Act, the KNB prescribed fixed rates for notary services. All notaries were bound by these rates and deviation from the rates was seen as in defiance with the rules of conduct and behaviour. Rates for family-law services were fixed. The underlying motivation was to guarantee equitable access to family services by setting reasonable prices. Rates for real property services were a fixed degressive percentage of the purchase price. As a consequence, when the prices on the housing market increased, the rates for real property services also increased. Finally, rates for corporate services were also fixed by the KNB. The prices for real property services were generally considered to be too high, but the prices for family services

were intentionally kept low. The high prices for property services were meant to compensate for the low prices for family services under a system of cross-subsidisation.

With the introduction of the new Act, the rates were set free. The rates for family services and corporate services became free immediately after the enforcement of the new Act. The rates for real property services were gradually liberalised through a transitional arrangement. In this transitional agreement, fees for real property services could vary within legally determined ranges. These ranges were expanded yearly. As of July 2003, all rates are unregulated. There are only two exceptions for which the rates remain regulated: 1) in case of family services for low-income households, 2) when it is necessary to guarantee the continuation of an accessible notary service. This legal provision gives the Minister the possibility to intervene, for example if the rates become extremely high.

The 'ministerieplicht', i.e. the obligation to offer the full range of services, still exists under the New Act, although with free rates it is possible to withhold certain services indirectly. By charging a very high price for a certain service a notary can discourage his clients, so he can abstain from offering this service.

Role of the professional organisation

Under the old Act the KNB was a private association, whose role was to defend the interest of the notary profession. Membership was not mandatory. With the introduction of the new Notary Act the position of the KNB changed. The KNB was transformed into a public body with statutory powers. A public body has to serve the public interest, so the main issue of the KNB could no longer be the interest of the notary profession. The KNB's new task is to promote a good practice of the notary's duties and to promote the notary's professional skills.

Membership of the KNB has been made mandatory for junior notaries and notaries. The KNB still offers professional training, and supervises the quality of the training. Since the rates are free and the establishment policy is also liberalised, the KNB is not involved in these areas anymore.

Quality controls

Quality of notary services is guaranteed by the professional standards set for appointment: the required university education, the requirements on the work placement, the professional training and the oath that every notary has to take before being appointed. The new status of the KNB also emphasises the role of the professional organisation on quality insurance. In recent years, the KNB took several initiatives, such as compiling a quality handbook, issuing a code on clear rates and price quotes, voluntary auditing between notaries, and issuing rules on the administration of a notary's office.

The 19 Supervisory Chambers (one for each district) provide oversight and have the authority for disciplinary intervention. The Chambers oversee compliance with the Notary Act and other regulations based on the Act. Two other organisations provide oversight: the

Authority for Financial Supervision (Bureau Financieel Toezicht, BFT) which oversees notaries' compliance with all financial regulations including the solvency and liquidity of notaries' offices, and the KNB, which oversees compliance with the professional standard and the code of conduct.[6] Both the BFT and the KNB can file complaints at the Supervisory Chambers. The Supervisory Chambers have the power to start an investigation against a (junior) notary at its own initiative or when a complaint filed by another party warrants further action.

Advertising

Rules on advertising are part of KNB's regulation supplementary to the Notary Act. Until halfway through the 1980s individual notaries were strictly forbidden to advertise. Only the KNB did some advertising on the notary profession in general. After the prohibition was abolished, advertising was still not completely free. The advertisement had to aim at the local market, so other notaries would not be affected. Other publicity was only allowed if it was functional and not meant to solicit costumers. Currently, advertising is still regulated:

- The publicity has to be in accordance with the carefulness that belongs to his profession. The publicity has to be truthful and objective.
- The notary may compare his services to the services of other notaries only at the condition that the elements that are compared can be verified and are not misleading.
- The notary is not allowed to approach potential customers directly by telephone or by personal contact. He can only approach customers by postal mail. He is allowed to approach his existing clients with information or recommendations.
- The notary is only allowed to express in publications that he has special expertise if this can be proved on the basis of his acquired knowledge and expertise.
- Publicity on rates has to be complete and clear. It is not allowed to only mention minimum-rates. The notary is bound by the rates and conditions, which he publishes.

2.3 Recent developments in the notary market

The report of the Commissie Monitoring Notariaat (2003) presents the main developments in the Dutch notary market over the 1999-2003 period. They can be summarised as follows:

- There has been no significant increase in the supply of notaries after 1999. The total number of notaries remained limited and the gradual growth of earlier years in the number of appointed notaries continued. The number of junior notaries declined after 1999. The decline is due to a

[6] There are five additional authorities that are indirectly supervising the quality of notary services, namely: the Minister of Justice, the Crown, the Chairman of the districts ('ringvoorzitters'), the Inspection of Registration and Succession and the Ombudsman.

reduced inflow from students rather than a greater outflow of junior notaries into notary positions.

- There has been no significant increase in the number of new independent offices. Between 1994 and 2000 the number of independent offices remained stable between 740 and 750 offices. Afterwards the number of independent offices slightly increased to 768 in August 2004.
- In fact, most of the newly appointed notaries joined already existing offices. The average number of notaries per office increased from 1.4 to 1.7 between 1993 and 2000.
- The rates for family services increased considerably. Between 1999 and 2004 the price for drawing up a will almost doubled, the price for a marriage contract with two equal wills increased with 60 % and the price for a partnership agreement increased with almost 40%. The liberalisation of the rates after the introduction of the new Act is probably not the only explanation for the considerable increase in the rates for family services. Indeed, this increase can also be explained partly by the fact that the average deed in the family practice has become more complex and requires more time, due to the changes in the law of inheritance.
- The rates for real estate services decreased sharply (moderately) for large (small) real estate transactions.
- Both in 2002 and 2004, small offices, with four or less notaries, were on average cheaper than large offices. In 2004, in two-third of the cases large offices were 10 percent more expensive than small offices.
- The profitability of the notaries' offices has declined, mainly due to aggregate fluctuations in the market. Average costs increased because of higher personnel costs as well as higher expenses for housing and interest.
- The number of complaints registered at the KNB has remained stable over the years. The number of complaints filed at the Supervisory Chambers doubled between 1999 and 2003. Consumers remained satisfied about the quality of service of notaries.

2.4 Summary and conclusions

Table 2.2 summarises the insights.

Table 2.2	Summary on recent developments in the Dutch notary profession		
	Old Notary Act	New Notary Act	Developments in the notary market
Appointment	3 years work placement	6 years work placement	No market growth in the number of notaries
	Optional professional training	Mandatory professional training	No market increase in the number of offices
	Need to wait for vacancy	No need to wait for a vacancy	Most new notaries join existing offices
	Maximum number of notaries	Approval of business plan required	
		Increase limited to 10% new notaries per year until 2003	
Prices	Fixed rates for family and real property services	Free rates in 1999 for family and corporate services	Sharp increase in rates for family services and small real estate services
	Recommended rates for corporate services	Free rates after 2003 for real property services after transition period	Moderate decline in rates for real estate services and large real estate services
Quality control	KNB as private body	KNB as a public body	Stable number of complaints filed at the KNB
	Direct supervision by Supervisory Chambers	Direct supervision by Supervisory Chambers, KNB and BFT	Increase in the number of complaints filed at the Supervisory Chambers
	Disciplinary jurisdiction in the hands of arbitration boards and Supervisory Chambers	Disciplinary jurisdiction by Supervisory Chambers	Consumers remain satisfied

In this chapter, we described changes in the regulatory framework are transforming the Dutch notary profession. By looking at the institutional framework and the recent developments on the notary market, we can already present a few qualitative insights on the effects of the 1999 Notary Act on competition and quality.

Regarding competition, the Notary Act greatly facilitated entry in the profession, notably by abolishing the maximum on the number of notaries. There remain, however, several institutional obstacles that may hinder entry: 1) the mandatory approval of the business plan and 2) the interdiction to specialise (the fact that an office must offer full services, the 'ministerieplicht'), is perceived by junior notaries as a barrier to open a solitary office, as it requires a broader knowledge on a large range of services. Trends in the notary market show that actual entry in the previous years has been very limited. In addition, the growth in the supply of notaries has slowed down. Offices have also increased in scale, possibly as a result

from the new Act. Indeed, in a more liberalised market with a greater uncertainty, junior notaries prefer to join existing offices rather than to open a new practice. This trend, however, might tend to reduce competition.

Besides entry, the liberalisation of prices enforced by the Notary Act has had positive effect on competition. However, the interdiction to specialise at the office level does not go along with free prices. Indeed, a notary can withhold certain services simply by charging a very high price.

Regarding quality, the Notary Act reinforced the existing professional standard. The Notary Act was mainly characterised by a reorganisation of the jurisdictions on quality controls. The creation of the BFT aims to guarantee the solvency of notaries. The role of the KNB on quality has been reinforced. There is evidence that some aspects of quality deteriorated.

3 An economic interpretation of notary services

This chapter provides an economic interpretation of notary services. We take a theoretical standpoint and analyse what type of regulation is prudent. The aim of the chapter is threefold. First, a discussion on why a complete liberalisation of the market for notary services might fail guides us to where regulation is most needed.[7] Second, as regulation might harm competition, we sketch the trade off where relevant. Third, an analysis of possible market failures sets the stage for a translation of our empirical findings into policy options.

There are two perspectives on regulation of professional services, of which the notary is one. One perspective is the *public interest* approach. In that approach regulation is seen as a way to avoid unwanted consequences of a fully liberalised market. Hence, regulation 'repairs' market failures related to market power, information asymmetry and externalities. When such regulation can be implemented cost-effectively, it leads to welfare improvement. The second perspective is the *private interest* approach. That is, the professionals or their private (or even public) representatives are able to lobby for regulation that is favourable for the professionals but not for general welfare. Regulation that fits the first criterion is what we call 'prudent regulation'. Next, we define homogenous groups of products of the notary and examine what market failures would occur if there would be no regulation.

3.1 Regulation for quality: the notaries product and its characteristics

We discern three different products that a notary provides, that we give short labels for the sake of the exposition. First, *advice*: the notary provides advice to clients on legal (and to some extend fiscal) issues, mainly related to business, real estate and wills. Second, *legal transactions*, the notary 'sells' documents and transactions that represent what the clients want and agree upon, in a legally valid manner. These include acting as an intermediary in the sale of real estate, such that the money and the asset can be exchanged simultaneously. *Third parties*, the third product is different from the more regular market transactions; the notary also provides services to third parties, hence those not directly involved in the transaction. These include for example: the protection of the interests of third parties and the provision of correct and up-to-date information to the land registry.

Though formulated somewhat abstract these three products capture what is going on inside the notary offices. For all three products, quality is the key element. We discuss for advice, legal transactions and third parties what would go wrong if there would not be some kind of specific regulation.

[7] An extensive discussion of potential market failures in professional services and possible market and non-market solutions is provided in Nahuis et al. (2005). Here, we do not systematically discuss these, as we focus the discussion around the notaries' activities.

Advice

Advice is usually given face to face by a notary (or his or her employees). The service provided along with the advice (parking space, waiting time before an appointment, quality of the coffee etc.) can be assessed by clients. Clients are, however, not well able to judge the quality of advice due to the information advantage of the notary. The notary knows how much effort he puts in the quality of the advice and whether the advice is appropriate, whereas the client does not know it. What clients can experience might be a signal of quality: how much time is taken, how much questions does the notary pose etc. But, by and large, the advice of notaries is an example of a credence good. [8] Most clients will indeed never find out whether they got the best possible advice. And even if a client is going to it find out, it usually takes very long.

The consequence of the fact that clients cannot observe the quality of the advice is that notaries will have low incentives to provide high-quality advice. In general, quality provision is thus likely to be suboptimal.

In theory, the reputation mechanism can provide enough incentives for notary to provide good-quality services. Reputation can do its healthy work for the quality that consumers can observe like the quality of the coffee. However, the reputation mechanism is weak for the quality of the advice. Another difficulty in the case of notary services is that they are characterised by few repeat-buying. Clients only go to their notary a few times in their lifetime.

However, for advice, it is for consumers still possible (in theory) to shop around, as clients can consult more notaries before they draw up their will for example. An alternative mechanism could do a similar job: that is to make a notary liable for faulty advice. However, in many cases this would be very hard to prove and to assess.

For these reasons it seems justified that some form of regulation on quality control is present, like educational requirements or minimum quality standards.

Legal transactions

The notary plays an important and unique role in the civil law tradition. A document signed by a notary has a legal status, though there is no higher level ‘court’ above the notary. The quality of these legal documents is important for the well-functioning of the economy as they determine ownership of valuable assets and important liabilities. Consumers are very weak parties to control the quality of these transactions, for similar reasons as with advice. For legal transactions, however, consumers are not even able to get a real second opinion.[9] One of the key elements of quality of a notary is how well the transacting parties’ preferences are laid down in a legal document. This is very difficult to monitor or regulate as it is time consuming to check the quality of a document (*e.g.* the notary’s research has to be redone) and it difficult to find out if the notary requested and indeed obtained all necessary information of the client. This

[8] A credence good is a good for which consumers can almost never learn the quality of the product. It differs from search goods (quality is clearly observable) and experience good (quality can be learnt by experience and repeat purchases).

[9] The difference is not that black and white however. A draft of a legal document requested by one notary can be compared with a second notaries’ draft.

makes information disclosure (on mistakes) also difficult to organise. As the purely economic incentives to provide quality optimally are not very strong here, education, professional ethics peer-group pressure and the like are important.

For some legal transactions notaries are also the 'most trusted' party. Think of real property: the notary get the buyers' funds which he only transfers to the seller once the seller conveyed the property. For this service liability is not helpful for reasons different from those above. In this case proving who is to blame might be relatively straightforward. This, however, is not very helpful if a notary goes bankrupt or does a moonlight flit. Hence, to protect the parties' interests some specific rules might be needed. For example a specific requirement in bankruptcy law might be needed (exclude the account which has clients' money from the notaries assets).

Third parties

That notaries have to protect the interests of third parties is laid down by law. When two parties engage in a transaction, the notary, however, has no economic incentive to really represent third parties. This is similar to any other externality. So even if a notary does exactly what the transacting parties want, the quality might be too low from a social point of view if the interests of non-transacting parties are damaged. Obviously, if the notary does *not* do what the transacting parties intent there might also be damage done to third parties.[10]

If third parties interests are harmed, it might be argued that it is by definition the notary who is to blame. In that case information provision (naming and shaming) could work. However, again it is difficult to prove that third parties have been harmed (and that is possibly not detected). Moreover, such a measure is fundamentally flawed, as the (future) transacting parties do not care about third parties rights. So again, education, professional ethics, peer-group pressure and the like are important.

3.2 Quality regulation and the impact of competition

The discussion so far learns that for quality provision regulation, education, professional ethics and peer-group pressure are important. When evaluating the deregulation policy of the late 1990s it is important to address the following issues. First, is quality regulation less effective if competition increases? If this is the case, a trade off might exist. Competition might enhance efficiency but might deteriorate quality. Second, if such a trade off is present, then it is a question to what extent society is willing to trade off quality against efficiency.

[10] Here, we do not discuss the relation with the land registry, as this is from a theoretical point of view quite easy to organise. For each notary there is in fact only one party (the land registry). So clear rules on reporting quality could solve any externalities here.

Competition

By competition we refer here to a common sense definition: the degree to which efforts, of one firm relative to other firms, to please (potential) clients translates into more actual clients and profits. With efforts to please (potential) clients we refer to: lower price, providing better service or higher quality, advertising, reputation building etc. [11]

Quality that is assessable for clients (service and a part of advice)

For those dimensions of quality that clients can evaluate the theory predicts that more competition leads to quality levels closer to optimal quality (so here there is no trade off). Here it is clear that competition raises the marginal return to effort.

Quality that is not valuable for clients (third parties)

For quality that is not valued by consumers, theory suggests that competition would not change quality because there is no change in the incentives (the marginal return to effort is not affected). One reason for a lower quality might be that competition reduces the intrinsic motivation (read: professional ethics) to provide optimal quality.

Quality that is valuable but difficult to observe for clients

Here the question is whether the possible loss of intrinsic motivation is compensated by an increase in the marginal return to effort by more competition.

3.3 Summary

In this chapter, we presented the theoretical arguments that justify quality regulation of notary services. The presence of two main market failures - information asymmetry and externalities- explains that a notary will always have incentives to provide suboptimal quality. Market mechanisms, like reputation and liability, do not work sufficiently well to solve these issues. Only intrinsic motivation, ethics and peer group pressure can.

Regarding the effect of competition on quality, the expected impact of competition on observable quality is positive, that on other dimensions of quality is ambiguous. If there appears to be a trade-off between competition and quality, the question is to know to which extend society is willing to trade quality against efficiency gains. In the next chapters, we turn to quantitative results.

[11] For a formal definition of competition, see for example Boone (2001).

4 Measuring competition in the Dutch notary profession

In the previous chapters we presented qualitative insights about the competitive nature of the notary profession. In this chapter, we turn to quantitative measures of competition. Our objective is to compare the level of competition before and after the enforcement of the 1999 Notary Act.

In this chapter, we use two indirect indicators to measure competition: 1) a relative profit indicator and 2) a variation of the Bresnahan and Reiss indicator. To measure competition we first need to define what is the relevant market for notary services. Here we consider two relevant markets: namely the national market and the local market at the city level. When we take the national market as the relevant one, we implicitly assume that notary offices compete at the national level: that means that customers compare the services of an office located in the Randstad with the services of an office located in Twente. Obviously, professional consumers, like firms, banks and housing corporations are more likely than individual consumers to compare notary services at the national level. Therefore, we will loosely interpret the national notary market as being the market for corporate services and large real estate services. Instead, when we consider the local market as being the relevant one, we assume that the consumer compares the services of notary offices located in a geographical area of the size of a city ('woonplaats').[12] Therefore, we will loosely interpret the local notary market as the relevant market for the individual consumer or household, i.e. the market for small real estate transactions and for family services.

4.1 The relative profits indicator

4.1.1 Basic model

Our first method to measure competition is based on the idea that an increase in firms' efficiency (as measured by their performance) reflects an increase in competition. The intensity of competition is described by the relative profit (RP) introduced by Boone (2004) as follows:

$$RP = \frac{\pi(c_i, c_{-i}, \theta)}{\pi(c_j, c_{-j}, \theta)} \tag{4.1}$$

where $\pi(c_i, c_{-i}, \theta)$ denotes the variable profit of a firm with marginal costs c_i given the costs of other competitors (c_{-i}) compared to profits of firm j with costs c_j (given the costs of other firms). More intense competition raises the competition measure (θ) in equation (4.1). The intuition is fairly straightforward. Think of more competition as customers comparing firms more intensely. The increased competition reallocates output from less efficient to more

[12] Evidence from consumer surveys shows that the location and the permanent relation with a notary are the most important factors when selecting a notary (Commissie Monitoring Notariaat, 2003).

efficient firms. Moreover, increased competition selects the most efficient firms in the sense that the least efficient firms might go bankrupt. In any case, the most efficient firm's profitability increases (relative to the less efficient firm).

4.1.2 Assumptions and application to the notary market

The relative profit indicator requires data of fairly homogenous products. This is a reasonable assumption for the notary market as all notaries sell the same three types of services.

The indicator is also relatively data demanding as it requires data on profits and costs at the firm level. Although the theoretical derivation of the relative profit indicator is based on marginal costs, in the empirical application we are forced to rely on average variable costs, as data on marginal costs are not available.

The relative profit indicator can be computed at different market levels. Here we will apply it both at the national market level and at the local markets level (that is the city -'woonplaats'-level).

4.1.3 Data

The data on costs and profits are based on firm-level data from a yearly survey undertaken by Statistics Netherlands (CBS) among individual firms (the so-called Production Statistics data set) over the 1996-2002 period. The survey is a representative sample of notary offices with at least 20 employees. The accounting data include − amongst others − the following key variables: gross output, before-tax profits, total turnover, employed persons, intermediate inputs, wage costs (including social security charges) and other costs. For all firms, we computed average variable costs as the ratio of total variable costs over total revenues. Table 4.1 provides some descriptive statistics of the sample.

Table 4.1 Descriptive Statistics

Mean values (in 1000 euros)	1996	1997	1998	1999	2000	2001	2002
N	197	137	571	271	244	280	241
Total revenues	2647	3259	2099	2939	3040	2730	1363
Profits	460	567	344	500	458	379	360
Average variable costs	0.58	0.59	0.64	0.63	0.69	0.71	0.64

For some of the firms sampled, the data are available for several years and sometimes over the whole 1996-2002 period. This allows us to construct a (unbalanced) panel of 750 firms. Nevertheless, data are only available over the whole period for less than 5% of these firms. For about 50% of the firms we have data on a period of 3 years or less. In this chapter, we mainly focus on the results from our cross-section estimates. Nevertheless, we will also present the panel data estimations as a robustness test.

4.1.4 Estimation and results

The empirical specification we employ is the following

$$\log\left(\frac{\pi_{imt}}{\bar{\pi}_{mt}}\right) = \alpha + \beta_t \log\left(\frac{c_{imt}}{\bar{c}_{mt}}\right) + \gamma\Gamma_t + \varepsilon_{imt} \qquad (4.2)$$

where π_{imt} is the gross profit of firm *i* in market *m* in year *t*, c_{imt} is the average variable costs, Γ_t is a vector of time dummies and ε_{imt} is the error term. Variables with a bar are yearly averages of all firms on the relevant market. The parameter of interest is β_t. We expect β_t to have a negative sign because relatively efficient firms (with low average costs) make higher profits. By looking at how β_t evolves over the years, we can infer on the variation of competition over time. Since we use a logarithmic transformation we eliminate all loss-making firms, i.e. firms with negative profits. In theory, the presence of these firms may affect the profitability of other firms and the level of competition in the industry (especially if these firms are price-fighters for instance). Excluding those may thus bias our estimates. However, given that loss-making notary offices only represent less than 10% of our sample, the bias is likely to be small.

We estimate equation (4.2) both by ordinary least squares on the cross-section dataset and by fixed effects estimation on the panel dataset. The advantage of the fixed effects estimation is that it allows us to capture all firm-specific characteristics (including scale).

National market

Table 4.2 presents the OLS and fixed effects estimates of β_t over the 1996-2002 period when we consider the national market as the relevant market for notary services. By including time dummies in equation (4.2), we corrected for business cycle effects. This means that we corrected for fluctuations that could be caused by a boom in the economy, such as a rise in house prices (as this is likely to affect notaries' profits).

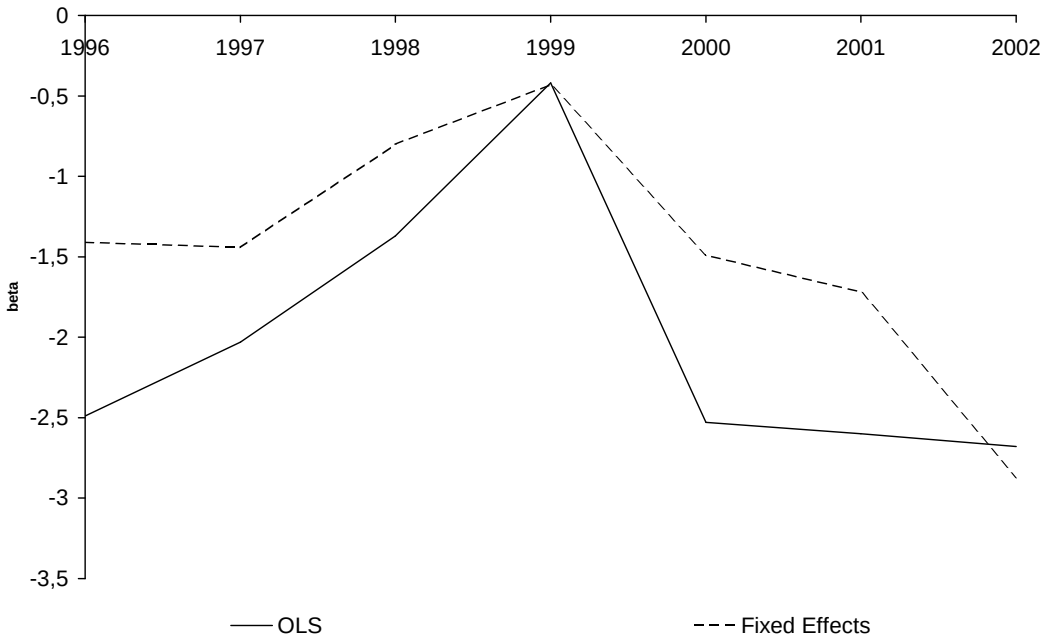
All our estimates for β_t are negative and highly significant. Figure 4.1 shows the evolution of competition over the period using our OLS and fixed effects estimates. We observe that β_t increases over the 1996-1999 period and decreases after 1999. We find the same trend with the fixed effect estimator, suggesting that our results are robust. Our estimates suggest that competitiveness in the national market has declined from 1996 to 1999 and has increased from 1999 to 2002. The increase in competition after 1999 can be interpreted as an effect of the 1999 Notary Act. However, the decrease in competition before that date is a puzzling result.

Table 4.2 Estimates of the relative-profit indicator on the national market for notary services

	OLS	Fixed Effects
N	1941	750
β (1996)	– 2.49***	– 1.41***
β (1997)	– 2.03***	– 1.44***
β (1998)	– 1.37***	– 0.80***
β (1999)	– 0.42***	– 0.43***
β (2000)	– 2.53***	– 1.49***
β (2001)	– 2.60***	– 1.72***
β (2002)	– 2.68***	– 2.87***
T1996	0.08	– 0.11**
T1997	0.01	– 0.25***
T1998	0.03	0.21***
T2000	– 0.03	– 0.11**
T2001	– 0.08	– 0.02
T2002	– 0.15**	– 0.05
const	– 0,44***	– 0.44***
R2	0.22	
R2 within		0.32
R2 between		0.16
R2 overall		0.18
σ_u		0.88
σ_e		0.44
rho		0.79

Standard errors are given in brackets. */**/*** indicates significance at the 1/5/10 percent level, respectively.

Figure 4.1 **The estimated slope of the relative profit indicator (1996-2002) for the national market, OLS and Fixed Effect estimates.**



We tested whether there was a significant variation in competition with regard to 2002. Test results are given in Table 4.3. Using our OLS estimates, we find no significant increase in the level of competition between 1996 and 2002. Only in 1998 and 1999 was the level of competition significantly lower than in 2002. Using our fixed effects estimates, however, we find that the level of competition in 2002 is significantly higher than in all other years. Therefore, the results on the national market are rather mixed. Using our fixed effects estimates, there is evidence that competition has significantly increased after 1999.

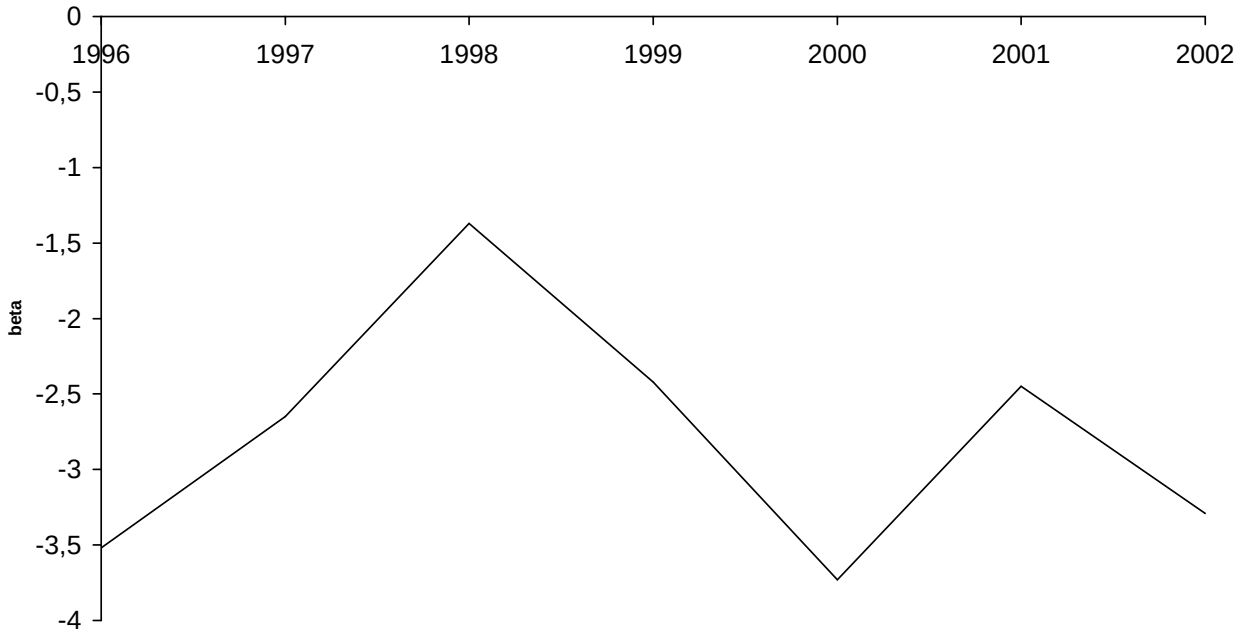
Table 4.3 **Test results**

Test	OLS	Test result	Fixed Effects	Test result
β[96]=β[02]	0.19	do not reject	1.45	reject
	(0.41)		(0.27)	
β[97]=β[02]	0.64	do not reject	1.42	reject
	(0.44)		(0.28)	
β[98]=β[02]	1.30***	reject	2.06	reject
	(0.28)		(0.19)	
β[99]=β[02]	2.20***	reject	2.43	reject
	(0.27)		(0.20)	
β[00]=β[02]	0.14	do not reject	1.37	reject
	(0.37)		(0.24)	
β[01]=β[02]	0.08	do not reject	1.14	reject
	(0.34)		(0.22)	

Local markets

In a second step, we consider local markets (at the city level)[13] as the relevant market for notary services. We estimate equation (4.2) with the *m* subscript representing the city in which the notary office is located. We compute $\bar{\pi}_{mt}$ as the yearly average profits and $\bar{c}_{mt}$ as the yearly average costs of all firms located in the same city. We only estimated the relative profit indicator at the local level on our cross-section data using OLS. We do not have enough observations to build a panel to estimate fixed effects at this level of analysis. Table 4.4 presents our estimates and Figure 4.2 shows the evolution of β_t over the 1996-2002 period.

Figure 4.2 The estimated slope of the relative profit indicator (1996-2002) for the local market, OLS.



The trend in Figure 4.2 suggests a decrease in competition between 1996 and 1998, followed by an increase in competition after 1998 and again a slight decrease in 2001 followed by a slight increase in 2002. Table 4.5 presents the results of our tests for a significant variation of competition compared to 2002. We find here again that the level of competition in 1996 does not significantly differ from the level of competition in 2002 on the local markets. Only in 1998 was the level of competition significantly higher than in 2002.

[13] We also performed estimations at the municipality (gemeente) level. We found similar results as at the city level.

Table 4.4	**Estimates of the relative-profit indicator on the local (city) market for notary services, OLS**
N	606
β (1996)	− 3.41***
	(0.85)
β (1997)	− 2.38**
	(1.04)
β (1998)	− 1.25***
	(0.23)
β (1999)	− 2.21***
	(0,62)
β (2000)	− 3.98***
	(0.65)
β (2001)	− 2.39***
	(0.47)
β (2002)	− 3.44***
	(0.67)
T1996	0.00
	(0.15)
T1997	− 0.00
	(0.16)
T1998	− 0.09
	(0.10)
T2000	− 0.13
	(0.13)
T2001	− 0.14
	(0.12)
T2002	− 0.19
	(0.14)
const	− 0.22**
	(0.09)
R2	0.21

Standard errors are given in brackets. */**/*** indicates significance at the 1/5/10 percent level, respectively.

Table 4.5	Tests, β significant different from 2002, OLS estimates		
Test	Coefficient	Standard error	Test result
β[96]=β[02]	0.04	(1.1)	do not reject
β[97]=β[02]	1.06	(1.2)	do not reject
β[98]=β[02]	2.19***	(0.71)	reject
β[99]=β[02]	1.23	(0.91)	do not reject
β[00]=β[02]	– 0.53	(0.93)	do not reject
β[01]=β[02]	1.05	(0.82)	do not reject

Just like in the national market, we find that competition first decreased before 1999 and increased afterwards, although in local markets the increase after 1999 is not significant. Compared to the national market, we can draw two additional insights from our study of the local markets. First, the level of competition on the local market is higher than on the national market (the β_t are higher on the national market). This confirms that much of the competition is nowadays still taking place on the local markets. Second, the increase in competition that follows after 1999 is more important on the national market than on the local markets. After 1999, there is less variation in the local markets than in the national one.

How can we interpret our results on the relative-profit indicators? On both the national and the local market[14] we observe that competition has increased after 1999, this increase can be interpreted as the result of the implementation of the 1999 Notary Act. Nevertheless, the level of competition in 2002 does not significantly differ from the level of competition in 1996. It seems that the increase in competition after 1999 just cancelled out a decreasing trend in competition before that date. This is very clear on the local markets, whereas our results on the national market are more mixed depending on the estimation procedure we use. On the national market, there is some evidence that competition in 2002 is significantly higher than in 1996. Further, we find that the 1999 Notary Act has had more impact on the national market than on the local one. This can be interpreted as saying that the 1999 Notary Act mainly benefited professional consumers over individual ones. In other words, the individual consumer market, that is the market for family services or small real estate transactions, has benefited less from the deregulation than the market for corporate services or large real estate transactions.

In the next section, we measure competition using a second indicator, namely the Bresnahan and Reiss indicator. This indicator applies to local markets only and serves thus also as a check for the results above.

[14] On the local market, the increase in competition after 1999 is not significant.

4.2 The Bresnahan and Reiss indicator

4.2.1 Basic model

Our second method to measure competition is a variation of Bresnahan and Reiss (1991), so our description here is brief. A detailed mathematical description of the method is given in Appendix B. The Bresnahan and Reiss (BR) indicator looks at how entry of a new firm in a (geographically defined) market affects the profit margins of existing firms. When entry leads to a decrease of profit margins, competition has increased in the market.

The attractiveness of the indicator rests in the fact that it does not require data on price-cost margins to assess changes in competition. Instead, Bresnahan and Reiss use market size as a proxy for the price-cost margins. The intuition of the BR indicator is that when profits per transaction fall (due to an increase in competition) firms need a larger market size, i.e. they need to sell their products to a larger number of consumers, to maintain their levels of profits. The critical market size for a firm to enter a market and be profitable is called an entry threshold. In fact, a variation in competition due to entry of a new firm is reflected by the ratios of the per firm post-entry thresholds over pre-entry ones. When this ratio is larger than one competition has increased in the market. When the ratio is equal to one the level of competition has remained unchanged.[15]

An example

We can illustrate the intuition of the BR indicator with an example. Suppose that we observe that it takes a market size of 10,000 potential customers to support a monopoly notary office. The monopoly entry threshold is then s_1=10,000. Suppose now that we observe that it takes 30,000 potential customers to support two notary offices. This means that in a duopoly market, each firm needs s_2=15,000 consumers to breakeven and be profitable. The ratio s_2/s_1 is equal to 1.5 which is larger than one, so we can conclude that, compared to the monopoly situation, entry of a second firm resulted in a fall in profits margins and thus an increase in competition. However, if we observe that it takes only 20,000 potential customers to support a duopoly (s_2=s_1=10,000), this implies that profit margins have not been affected by the entry of a second notary office in the market. As the level of competition has been left unchanged, we can suspect collusive behaviour between the two firms.

The methodology of Bresnahan and Reiss (1991) has been applied in different industries. Pfann and van Kranenburg (2003) compare, like we do, time periods before and after a policy reform, but then in the local newspaper market. Our basic specification follows Genesove (2004), who also analyses the newspaper market. Other papers employing the methodology of Bresnahan and Reiss include work on physicians (Brasure et al., 1999), hospitals (Abraham et al., 2003 and

[15] When there are a very large number of firms in the market, a ratio of one can also indicate that there is perfect competition. Indeed, theoretically in that case firms all earn zero profits and the profits margin does not decrease anymore after entry.

Dranove et al., 1992), banks (Cetorelli, 2002), motels (Mazzeo, 2002) and driving-schools (Asplund and Sandin, 1999).

4.2.2 Assumptions and application to the notary market

An important condition for the interpretation of the indicator is that the market for notary services is local. According to our loose interpretation of local markets for notaries, this implies that this method is more appropriate to measure competition in the market for individual consumers than for professional consumers. In other words, the methodology applies best to small real estate services and family services.

Another implicit assumption is that entry actually occurs freely or at least easily in the market. Nahuis et al. (forthcoming) show, however, that the BR method remains informative in a market with regulated entry at the condition that the market size grows with the number of firms.

Next, an implicit assumption of the model is that optimal efficient scale is the same for all offices. In other words, we consider homogenous firms. This is potentially a strong assumption in the case of notary offices as we observe a large variety of scales of offices in our sample. Finally, just as the relative profit indicator, this method assumes that the product is homogenous. This is a reasonable assumption in the notary market as all notaries are obliged by law to sell all types of services.

Comparing the relative profit measure to the BR indicator.

Though we will use both indicators in the empirical application (where possible) the BR indicator has several advantages above the RP indicator, for our purpose.

First, the BR is far less data-demanding than the RP measure. The RP measure requires data on marginal costs and profits. To get reliable data for these variables is notoriously difficult. For pharmacies, for example, even approximations of these data are not available. The only firm data the BR measure needs are locations of professionals.

Second, some professional services consist mainly of very small firms. A large part of the cost is owner's effort. This does not end up in the measured costs that the RP indicator exploits. The BR indicator captures everything that puts margins (including quality effort) under pressure.

4.2.3 Data

Market definition

We use local towns ('woonplaats') to define our local markets. There are about 2430 of these towns in the Netherlands. We try to minimise for the possibility of consumers to travel outside their market by considering markets which are isolated from other large cities. We construct isolated markets by excluding:[16]

1. Towns with more than 50,000 inhabitants as these large towns are in fact composed of several local markets which we cannot disentangle from each other,
2. Towns located within a radius of 20km from a large town of 100,000 or more inhabitants,[17]
3. Towns located within a radius of 7km from another town of 20,000 or more inhabitants.

Dependent variables

Our dependent variable is the number of notary offices active in a market (NOT) as registered in the KNB yearbooks for the years 1995 and 2003 (January 1st). The KNB dataset records 755 and 853 notary offices in 1995 and 2003, respectively. After selecting for isolated towns, we are left with 126 and 138 notaries' offices in 510 local markets in 1995 and 2003, respectively.[18]

Independent variables

Many factors can affect the demand for notaries in a local market. Firstly, the market size is an important demand shifter. The market size is composed of two variables: the population of the municipality (POP) and the nearby population (NPOP). The latter is constructed by summing all the population living within 3km of the local market but which is still outside that local market.[19] Secondly, the demographic composition of the market also affects the demand for notaries. We include the percentage of people under 20 years old (YOUNG) and the percentage of people above 65 years old (OLD). Finally, we also include the average income per capita (INC) and the average housing price (HOUSE)[20]. Housing prices can be a demand or a cost shifter. In the former case, it reflects revenues from real estate transactions; in the latter case it reflects the fixed costs to open a notary office.

Table 4.6 describes the data for our isolated markets.

[16] In our robustness tests, we also consider less strictly isolated markets, as this selection tends to exclude almost the whole Randstad area in the Netherlands. For instance, we allow proximity to large towns and we also allow for interrelated markets by including a distance variable (DIST1) that represents the distance to the nearest market in which at least one notary office exists, just like Asplund and Satin (1998) for the Swedish driving school market. See Appendix.

[17] All our distances are bird-flight distances.

[18] We selected the same identical markets in both years.

[19] Obviously, there are some municipalities with a zero nearby population. This occurs when the municipality itself has a radius larger than 3km, or for those municipalities close to borders with Germany and Belgium.

[20] What we use is the valuation of houses for fiscal purposes.

Table 4.6	Descriptive Statistics					
Variable		N	Mean	Std. Dev	Min	Max
NOT	1995	510	0.24	0.57	0	4
	2003	510	0.27	0.58	0	4
POP	1995	510	3797	6194	120	44600
(inhabitants)	2003	510	4020	6721	110	49900
POP3KM	1995	510	1709	3178	0	23070
(inhabitants)	2003	510	1665	3129	0	25500
YOUNG	1995	510	0.32	0.04	0.22	0.53
(%)	2003	510	0.31	0.04	0.16	0.51
OLD	1995	510	0.13	0.03	0.03	0.3
(%)	2003	510	0.13	0.04	0.02	0.26
INC	1995	510	8	0.8	5.3	11.2
(x 1000 euros)	2003	510	10	1.1	6.3	22.7
HOUSE	1995	510	80	21	35	153
(x 1000 euros)	2003	510	139	36	70	275

Table 4.7 gives the number of markets in which 0,1,2 or 3 notaries are present. We included all markets with more than three notaries in the last category. However, we do not have many observations in the category 3+, so we will not report the entry thresholds for this category.

Table 4.7	Market counts and description					
	1995 Freq.	%	Av.pop	2003 Freq.	%	Av.pop
0	411	80.6	1905	400	78.0	1829
1	80	15.7	9178	90	17.6	8947
2	13	2.5	16036	14	2.7	21779
3+	6	1.2	35198	6	1.2	34778

In 2003, 78% of our local markets had no notaries at all. This is more than in 1995 where the proportion of markets without notaries is of 80.6%. Markets without notaries are rather small with an average population of 1905 and 1829 inhabitants in 1995 and 2003, respectively. By contrast, markets with 3 or more notaries have an average population above 30000 inhabitants.

4.2.4 Estimation and results

We estimate the demand for notaries offices in a local market by an ordered probit with a specification as in Genesove (2003):

$$\Pr(\pi_{ki} \geq 0) = \Pr(N_i = k) = \alpha + \beta \ln(S_i) + \gamma X_i + \delta_k + \varepsilon_i \qquad (4.3)$$

where $Pr(\pi_k \geq 0)$ is the probability that the profits of $k=0,1,...N$ notaries offices in a local market i is positive, $Pr(N = k)$ is the probability that there are exactly k offices in the market, S is the market size of the local market which is a function of the population of in the market (POP) and the nearby population (POP3KM), X is a vector of demand shifters (OLD, YOUNG, INC, HOUSE), that affects the demand for notaries in a local market, δ_k are the cutpoints of our ordered probit estimations, and ε is the error term. By setting the breakeven profits to zero and solving for S, we obtain the entry threshold to support k firms in the market.[21]

We estimate entry thresholds for both years available, before (1995) and after (2003) the deregulation reform. In a way, this is similar to a 'difference-in-difference' approach. Table 4.8 presents our baseline estimates. Additional robustness results are presented in Appendix. We find that population positively affects the demand for notaries. Income per capital has a positive significant impact on the number of notary offices in a market. Finally, house prices have a negative significant coefficient, reflecting thus the fixed costs to open a notary office.
Table 4.8 also gives the entry thresholds estimates obtained with the specification given above. The duopoly/monopoly ratios are of 2.55 and 2.61 in 1995 and 2003. In 1995 (2003), each firm in a duopoly needed to attract 155% (161%) more customers than in the monopoly situation. As the ratios lie above one, we find that entry affects conduct in the notary market. However, the difference between the two ratios in 1995 and in 2003 is small. Therefore, we performed additional tests to check whether this difference was significant.

[21] See Appendix for more details. We define S_k as the market size required to supports k firms in the market, while s_k represents the market size required *per firm* to support k firms in the market.

Table 4.8	**Baseline Estimates**	
	1995	2003
N	510	510
LNPOP	1.14***	1.43***
LNPOP3KM	0.01	0.005
INC	0.87***	0.38***
OLD	3.4	5.5
YOUNG	5.3	3.4
HOUSE	– 0.015***	– 0.006**
Log-likelihood	– 178	– 160
s1	6178	5695
s2	15734	14850
s2/s1	2.55	2.61

Standard errors are given in brackets. */**/*** indicates significance at the 1/5/10 percent level, respectively.

Table 4.9 provides the results of several tests on our estimates. For both years we test whether the monopoly thresholds equal the duopoly thresholds, that is whether $s_1=s_2$. We can reject the null hypothesis that these thresholds are identical. In addition, the test results show that there is no significant difference between the 1995 and 2003 thresholds. Therefore, the level of competition in 2003 is not significantly different from the level of competition in 1995. This confirms the result that we found using the relative-profits indicator for local markets.

Table 4.9	**Test results**
1995	
Tests s1=s2	reject at ***
2003	
Tests s1=s2	reject at ***
Test s1[95]=s1[03]	do not reject
Test s2[95]=s2[03]	do not reject

4.3 Summary

In this chapter, we presented quantitative estimates of the level of competition in the Dutch notary profession. We used two different indicators.

The first indicator is a relative-profits indicator that makes uses of firm-level data on profits and costs. We estimate this indicator over the 1996-2002 period using two different definitions of the relevant market for notary services, namely the national and the local market. We find that competition increased after 1999, but to a level comparable to 1996. This is very clear on the local markets, whereas the patterns on the national market are more mixed. In the national market, there is some evidence that competition increased to a level higher than in 1996.

We also find that the level of competition is higher on the local markets than on the national one, which is not surprising since the notary services still remain primarily local. More importantly, we find that there has been less variation in competition after 1999 on the local market than in the national market. This implies that the individual consumer did not draw yet all full benefits from the 1999 Notary Act.

Our second indicator is a variation of the Bresnahan and Reiss entry thresholds indicator. This method assumes implicitly that the relevant market for notary services is the local market. We use data on geographical location of notary offices in 1995 and in 2003. Using this indicator, we find that entry affects conduct in the notary market. Nevertheless, we also find the same result as using our relative-profit indicator on the local market, namely that there is no significant difference between the level of competition in 1995 and in 2003.

In the next chapter, we assess empirically the impact of competition on the quality of notary services.

5 Quality and competition

In this chapter, we look at the effect of competition on quality. We use two different measures of quality: 1) subjective quality, i.e. quality that is perfectly observable for consumers; for this we have data from consumer surveys, and 2) objective quality, i.e. quality that is not observable for consumers; for this we use the number of corrections in notary acts registered by the Land registry in 1995 and in 2003. In both cases, we look at the impact of competition (represented by a dummy, 0=monopoly market, 1=oligopoly market) on quality. Here we consider thus competition at the local market. In that way, we compare the quality of notary offices located in monopoly versus oligopoly markets.

Obviously, there are many other facets of the quality of notary services that we cannot capture in this empirical analysis. Data on the number of corrections registered at the Land Registry only reflect a limited aspect of the true quality of a notary. In particular, we cannot distinguish between notary acts that had to be corrected because of a form had a typing mistake or because they were not in line with the code of the Land Registry. Nevertheless, we believe that these data still give an indication of the quality controls that a notary applies to his work.

5.1 Methodology

The question we address in this section is whether competition increases or decreases quality. To address this question we estimate the following equations:

$$Q_{i,m} = \alpha + \gamma D_m + \varepsilon_{i,m} \tag{5.1}$$

where $Q_{i,m}$ is the quality indicator of the notary i in market m. Our indicator for competition is a dummy variable that is one if market m is a monopoly market and zero otherwise. Next we introduce additional control variables X, that control for the size of the market:

$$Q_{i,m} = \alpha + \gamma D_m + X'\beta + \varepsilon_{i,m} \tag{5.2}$$

We have two indicators for the quality of the services provided by notaries. First, we have survey data on the quality perception of consumers for a given sample of Dutch notaries offices for the year 2002. Second, we have data on the quality of their work that is not visible to consumers: these are the percentage of corrections that notaries have to make upon request of the Land Registry. For quality/service that is observable by consumers, one expects that competition leads to better quality. For non-observable quality, it not very obvious what competition implies. Also, the expected impact of the price liberalisation is not straightforward.

However, the data allow us to assess the claim made by the profession that competition causes quality deterioration.

Several empirical papers examine the relationship between quality provision and market structure. For instance, Mazzeo (2003) studies the impact of competition on flight delays. He finds that delays tend to be longer on the routes for which airlines hold a monopoly, implying that the lack of competition decreases service quality. Mazzeo constructs several indices for competition: 1) the number of competitors on direct routes, 2) a HHI index on indirect routes and 3) the share of total traffic accounted for by each airline at each airport. He runs an OLS estimation with the flight delays (in minutes) as dependent variable and controls for other variables that might affect delays like weather, congestion, age of aircraft, etc. He finds a positive significant effect of competition on quality for all types of competition indices. Other empirical papers are Hoxby (AER,2000) for school quality, and Dranove and White (JEMS, 1994) for hospitals.

5.2 Results for subjective (observable) quality

This section compares the quality of services of notary offices as it is perceived by consumers between offices in a monopoly market and offices in an oligopoly market. Does competition increase or decrease the quality of service perceived by consumers? Is the quality higher in oligopoly than in monopoly markets?

5.2.1 Data

From 1999 to 2002 the EIM conducted yearly a telephonic survey among consumers of a sample of notaries' offices. In 2002, 1880 consumers of 54 offices participated (response rate: 95%). The questionnaire asked consumers to rate 5 different aspects of notary services: 1) access, 2) expertise, 3) customer-orientation, 4) quality of notary acts, and 5) clarity of the bill. In total, there were 22 detailed quality indices. Each aspect consisted of 2 to 6 questions with standard scales. Responses alternatives were typically: bad, moderate, sufficient, good and very good. We rescaled those alternatives on a scale from 1 to 5 (1 corresponding to bad, 5 to very good) and excluded the 'do not know' answers. In addition, consumers were asked to grade the overall quality of the office on a scale from 1 to 10 (10 being the highest). We rescaled this general index on a 1 to 5 scale.

Next to questions over quality, the questionnaire also includes questions about how the client selected the notary, whether he checked the price of several offices in advance, etc. Finally, the dataset contains additional data on the size of the surveyed notary office (graded from 1 to 4), the zip code area, the region and the province in which the office is located. Table 5.1 gives the average of each quality index for each year.

Table 5.1	**Average scores per quality index**					
			1999	2000	2001	2002
	Index	Overall score	4,03	4.04	4.06	4.02
ACCESS	Q1	reachable by phone	4.20	4.13	4.18	4.16
	Q2	appointment term	4.18	4.21	4.21	4.15
	Q3	opening times	4.07	4.06	4.04	4.09
	Q4	location	4.10	4.07	4.13	4.15
	Q5	parking	3.64	3.60	3.61	3.66
	Q6	building maintenance	4.22	4.21	4.32	4.25
EXPERTISE	Q7	knowledge	4.24	4.24	4.27	4.21
	Q8	able to listen	4.21	4.21	4.21	4.16
	Q9	able to explain	4.24	4.24	4.29	4.20
	Q10	trust	4.27	4.28	4.27	4.23
CUSTOMER-	Q11	friendliness	4.34	4.33	4.34	4.33
ORIENTATION	Q12	time available	4.28	4.29	4.28	4.25
	Q13	interest	4.23	4.22	4.24	4.17
	Q14	compliance with arrangements	4.22	4.23	4.22	4.20
	Q15	concept sent on time	4.11	4.12	4.08	4.10
	Q16	time to proceed transaction	4.14	4.13	4.12	4.10
NOTARIAL	Q17	information on alternatives	4.00	3.99	4.01	3.98
ACTS	Q18	easy to read	3.72	3.71	3.78	3.74
	Q19	information on act	4.19	4.17	4.21	4.14
	Q20	able to answer questions	4.20	4.21	4.24	4.19
BILL	Q21	clarity of the bill	4.08	4.07	4.08	4.04
	Q22	payment methods available	4.09	4.10	4.10	4.11
			N=1058	N=699	N=881	N=764

The quality indices are on average above 4, except for parking facilities and the readability of the notary act. In general, 'friendliness' scores the highest.

There are several data limits to our analysis of the effect of competition on quality. Firstly, we do not have data on individual characteristics of the respondents. Therefore, we cannot identify how these characteristics affect their responses. Second, we only have limited information on the notary offices (size and location). Other factors like the age of the office, the volume of acts or the distribution of the staff between notaries, junior notaries and support could also affect the quality of acts. In addition, we cannot distinguish between several notary offices located in the same zip code area. The lack of individual characteristics and the fact that most of our control variables are at the market level will have consequences for the goodness-of-fit of the estimations.

Finally, we can only construct the competition dummy (0=monopoly, 1=oligopoly) for the year 2003 using addresses in the KNB yearbook.[22] After matching the 2002 EIM dataset with

[22] We standardise the variables so that they have mean 0 and standard deviation 1.

the 2003 KNB dataset, we are left with a file of 635 questionnaires: about 66% (423) of these questionnaires evaluate the quality of notary offices in a competitive market, whereas 33% (212) measure the quality of monopolist notaries' offices.

5.2.2 Estimation and results

We proceed to data reduction by using Principal Component Analysis. The EIM dataset contains 22 variables that measure different facets of the quality of notary services. These variables are correlated to one another and we use this information to reduce the 22 variables to fewer variables which capture as much as possible of the variation in the original dataset. The new set of variables is then created as linear combination of the original dataset. The linear combination that explains the maximum amount of variation is called the first principal component. Then a second principal component can be found (independent of the first) that explains as much as possible the remaining variability.

The first step consists in computing the principal components (see table in Appendix). We focus on the components that are important. Together the first 4 components capture 50% of the variability. The elements of the eigenvectors represent the weights that are placed on each quality index in calculating each principal component. We interpret the first 4 components as follows:

1. In the first component, all 22 quality items enter in a similar fashion: the weights are all positive. This suggests that it reflects the average quality perceived. Indeed, the first component puts the highest weights on questions 8 (able to listen), 11-14 (all customer orientation items) and 19-20 (information, answer questions). This component reflects thus the average quality of the service received: how the consumer actually experienced the service.
2. The second component puts clear emphasis on aspects of location: the highest weights are on questions 4 (location) and 5 (parking).
3. The third one reflects the time-dimension of the transaction: it puts positive weight on all questions that are directly (or indirectly, like location) related to time: 2-4 (accessibility: term of appointment, opening times, location) and 15-16 (concept sent on time, time to proceed transaction). Consumers here value how quick the whole transaction with their notary was.
4. The fourth component reflects the price-dimension. The highest weights are clearly found on questions 21-22 (clarity of the bill, payments methods).

We call the 4 components SERVICE, LOCATION, TIME and PRICE respectively.
Using the weight table, the first component SERVICE can be calculated as 0.20*Q1 + 0.17*Q2 + 0.20*Q3 + … and so on.[23]

[23] We standardise the variables so that they have mean 0 and standard deviation 1.

We regress the 4 main principal components on the competition dummy, a dummy for whether the office is located in a large city and the logarithm of the population. The estimation results for each principal component and for the general index are given in Table 5.2.

Competition has a negative impact on the service ('friendliness') and time dimensions ('rapidity') of the quality of notary acts. The coefficient of competition on the quality of services is, however, not significant, just like the coefficient of competition on INDEX. The coefficient of competition on TIME is negatively significant. Instead, competition has a positive effect on the quality of the location and of the bill received. Being in a large city means that the office is well located. The BILL measure may capture the price dimension of the act although the questions were more explicitly on the 'clarity of the bill' and 'available payments method'. We can only conclude that the quality of the bill as perceived by consumers is higher in oligopoly markets than in monopoly markets.

Table 5.2 Auxiliary regressions (Principal Components and INDEX as Dependent Variables, OLS)

	SERVICE	LOCATION	TIME	BILL	INDEX
COMPETITION	– 0.19	0.13	– 0.22*	0.09	– 0.06
	(0.31)	(0.12)	(0.12)	(0.11)	(0.04)
LARGE CITY	– 0.004	1.08***	0.32	– 0.23	– 0.17**
	(0.53)	(0.22)	(0.21)	(0.24)	(0.07)
LNPOP	– 0.07	– 0.15***	– 0.05	– 0.02	0.013
	(0.13)	(0.05)	(0.05)	(0.05)	(0.01)
N	630	630	630	630	630
R2	0.003	0.032	0.012	0.006	0.013

Standard errors are given in brackets. */**/*** indicates significance at the 1/5/10 percent level, respectively.

The analysis of the subjective quality allows us to identify 4 relevant facets of quality of notary services that are relevant for consumers, namely: service, location, time/rapidity, and clarity of the bill. We find that competition has a negative effect on service. This effect, however, has little economic and statistical significance.[24] In addition, competition seems to lengthen the time needed to process a transaction as it is perceived by consumers. Competition positively affects the quality dimension on location and clarity of the bill (although not significant). Overall, however, the economic significance of these coefficients is very low. For instance, the mean of the INDEX variable is our sample is 4.02. When offices are located in competitive markets, this grade decreases to 3.96. The impact is thus very low and not worth being considered.
In addition, there are several difficulties with these estimations. First, we are confronted with data limits. Second, our results might be biased towards monopoly markets. Indeed, consumers might overestimate the quality of their notary in monopoly markets as they tend to have a

[24] A coefficient of -.19 corresponds to 1/5 of the standard deviation (recall that service is normalised with 0 mean and standard deviation of 1). Its economic significance is thus negligible.

permanent relationship with him. In the next section, we turn to a more objective definition of quality.

5.3 Results for objective (non-observable) quality

5.3.1 Data

The Dutch Land Register (Kadaster) provided us with the number of corrections and the total number of notary acts registered for each notary for both years 1995 and 2003. We construct a dummy for competition just as in Section 5.1. We selected the same sample of 734 notaries in both years. In 1995 and in 2003, there were 294 (40%) and 269 (36%) notaries located in a monopoly markets, respectively. Table 5.3 gives the descriptive statistics of our dataset.

Table 5.3 Descriptive Statistics, objective quality

1995	N=734			
	Mean	Std. Dev	Min	Max
Total number of acts	292	166	1	1210
Number of corrections	3	2.9	1	19
2003	N=734			
	Mean	Std. Dev	Min	Max
Total number of acts	261	170	1	1254
Number of corrections	2.8	2.3	1	14

5.3.2 Estimations and results

We estimate again equation (5.2) using as a dependent variable the logarithm of the number of corrections. We include as explanatory variables the usual control variables as in Section 4.2 and we add the logarithm of the number of notary acts in order to control for the number of possible mistakes. We assume a nonlinear relationship between the number of corrections and the number of notary acts. This reflects the fact that the total volume of acts has more impact on low numbers of corrections than on large ones.

We compare the quality of notaries' services between monopoly and oligopoly markets at two moments in time: before and after the 1999 Notary Act. Our estimates are given in Table 5.4. Note that the logarithm of corrections is an indication of low quality services. Therefore, a positive (negative) coefficient of competition must be interpreted as a negative (positive) effect on quality.

In 1995 competition had a negative significant effect on the number of corrections, implying that competition has a positive impact on the quality of notary services. In contrast, in 2003, we find that competition has a positive significant effect on the number of corrections according to specification (1). According to specification (2), in 2003 the effect of competition is still

Table 5.4	**OLS, dependent variable = Log(corrections)**			
	1995	2003	1995	2003
	(1)	(1)	(2)	(2)
N	734	734	734	734
Competition	– 0.14***	0.09**	– 0.16**	0.04
	(0.04)	(0.05)	(0.07)	(0.07)
Log(acts)	0.31***	0.28***	0,35***	0.25***
	(0.02)	(0.01)	(0.03)	(0.02)
Log(POP)	0.16	0.15	– 0.01	– 0.0005
			(0.02)	(0.02)
INC			– 0.07*	– 0.06*
			(0.04)	(0.04)
OLD			– 0.29	1.5
			(1.0)	(0.98)
YOUNG			– 0.13	0.16
			(0.69)	(0.66)
HOUSE			– 0.002*	– 0.002*
			(0.00)	(0.00)
R2	0.17	0.15	0.19	0.16
Test	(1)		(2)	
Comp[95]=comp[03]	reject at ***		reject at **	

Standard errors are given in brackets. */**/*** indicates significance at the 1/5/10 percent level, respectively.

positive but non-significant. This means that in 2003, monopoly notaries outperform notaries operating in oligopoly markets. In 1995 (2003), the number of corrections is 14% lower (9% higher) in oligopoly markets than in monopoly markets. Table 5.4 also includes the results of our tests on whether there is a significant difference in the effect of competition in 1995 and in 2003. We find that the effect of competition on quality in 1995 significantly differs from the effect of competition on quality in 2003.

Table 5.5 provides additional estimation results. The specification aims to answer the question whether the implementation of the new Act has more or less harmed quality in market where there is competition compared to those where there is no competition. The result shows that the 1999 Act (or at least the things that changed between 1995 and 2003) lead to worse quality in markets with competition.

Table 5.5 OLS, First difference estimation

OLS, dependent variable = Log(corrections03)-Log(corrections95)

	(1)
	N=734
Competition03 - Competition95	– 0.18**
	(0.10)
Competition	0.17***
	(0.06)
Log(acts 03) - Log(acts 95)	0.26***
	(0.03)
_const	– 0.09**
	(0.04)
R2	0.10

5.4 Summary

In this chapter, we provided a quantitative assessment of the effect of competition on quality. Regarding subjective quality, that is quality as it is observed by consumers, we find that consumers value several facets of the services of their notary, namely service, rapidity, location and clarity of the bill. We find that competition does not have the expected positive effect on quality as it perceived by consumers. If anything, competition decreases quality especially on the 'service/friendliness' and 'time to proceed transaction' dimensions. Nevertheless, these results have low economic significance and we cannot correct for the fact that consumers tend to overestimate the quality of monopoly notaries, as they are more likely to have a permanent relationship with him than with a notary located in a competitive market.

Regarding objective quality, measured here by the number of corrections brought up in notary acts registered at the Land Registry, we find that competition leads to a deterioration of quality in 2003, while this was not the case in 1995. Instead in 1995, competition had a positive effect on quality. Overall, our results suggest that there are reasons to be concerned about the impact of competition on the quality of notary services.

6 Key findings and policy implications

The purpose of this study has been to present an evaluation of the 1999 Notary Act. We aimed to assess the impact of the Notary Act on 1) the level of competition in the notary sector, 2) the quality of services. In this chapter we summarise our key findings on these issues and present directions for policy. While reading this chapter, one has to keep in mind that the dust of the 1999 reform might not have settled down or that the dust might not have been blown up completely. As our last data available date back to 2003, we also cannot infer the effects of the new Act in more recent years.

Has the 1999 Notary Act led to an increase in the level of competition in the notary sector?

Our qualitative analysis in chapter 2 showed that the deregulation process enforced by the 1999 Notary Act opened the scope for a rise of competition in the sector:

1. Many barriers to entry in the profession have been abolished. Establishment has become easier as the number of notaries is not limited anymore.
2. Prices have been liberalised (fully in the second half of 2003).

Nevertheless, we also identify some potential threats that may hinder competition. The check on the business plan remains an obstacle to the creation of a new office. The interdiction of specialisation makes it more difficult to open a solitary office. The increase in the size of notary offices, which is a potential result of the new Notary Act, might also partially mitigate the effects of the deregulation on competition. Of course, a larger scale might also generate lower costs due to scale economies.

Our empirical analysis in chapter 4 measures the level of competition in the notary market in two distinct relevant markets: namely, the national market (which is more likely the potential market for corporate services and thus for companies) and the local market (which is more likely the market for real estate and family services, and thus for the individual consumer). We find that competition tends to increase after 1999 but to a level comparable to 1996 (a benchmark year for which we have data and that is sufficiently ahead of the implementation of the new act). Overall, we find that the level of competition in 2002 does not significantly differ from the level of competition in 1996. This is very clear for the local market, whereas the pattern in the national market is more mixed. In the national market, there is some evidence that competition increased to a level higher than that in 1996. These results suggest that individual consumers may have benefited less from the impact of the 1999 Notary Act than professional consumers.

What is the effect of competition on the quality of notary services?

In chapter 3 we provided theoretical justifications for quality regulation in the notary profession. We emphasised that the quality of the notary product is composed of elements which are both observable and non-observable to the consumer. The non-observable part of quality calls for regulation since 1) due to information asymmetry, notaries tend to provide suboptimal levels of quality to consumers; market mechanisms like reputation, liabilities or even advertising can work to a certain extent but do not work sufficiently well to solve this issue 2) there are external effects; external effects in the sense that third parties might be affected by transactions that a notary executes (think of the quality of the Land Register, for example). The presence of information asymmetry and external effects supports the plea for quality regulations. This also tends to justify rules that guarantee the continuity of services, such as specific rules on bankruptcy. Continuity of services does not, however, imply that bankruptcy should be avoided at all costs, as this is at odds with a liberalised competitive market.

In chapter 3 we also discuss the theoretical arguments on the effects of competition on quality. We find that, in theory, we expect competition to increase the quality that is observable to consumers. There are, however, no clear cut predictions regarding the impact of competition on quality that is non-observable.

In chapter 5, we assessed empirically the effects of competition on quality. Despite the fact that the quality of notary services has several dimensions, we can only capture the facets of quality for which we have proxies that are measurable. In this study, we use two available measures of quality: 1) the quality as it is perceived by consumers in surveys and 2) the number of corrections registered in the acts passed at the Land Registry. Corrections records are informative about legal quality if mistakes are to some extent correlated with hasty or improper legal work. To the extent that this correlation exists, our proxies provide a good indication of legal quality, although we cannot capture all dimensions of legal quality,. We find that competition does not have the expected positive effect on quality of services as perceived by consumers. For objective quality - measured by the number of corrections in notary acts passed at the Land Registry - we find that in 2003 competition leads to a deterioration of quality, while this was not the case in 1995. On the basis of our proxies for quality, we conclude that there is some support for the concerns raised about a deterioration of quality resulting from competition.

Access to notary services

The 1999 Notary Act also aimed to preserve equitable access to notary services. There are two dimensions of access: physical and economic access. Are there reasons to be concerned about equitable access to notary services? In a world in which mobility has greatly increased in the last decades, it is obviously far less relevant today to be concerned about providing equitable physical access to notaries than in the past. Therefore, regulation on the geographical distribution of notaries is nowadays very hard to justify. The 'ministerieplicht' is an instrument that aims to guarantee this equitable access. It might, however, even have been ineffective as, by charging high prices, notaries can implicitly stop offering certain services. Thus, economic access is not enhanced. In fact, the motivation behind equitable access is mainly a political choice. From an economic perspective, equitable economic access is best achieved by sufficient competition that, in turn, guarantees low prices. If this is not sufficient, subsidies targeted at low-income groups might be an option.

Options for policy

From the above results we can draw some possible options for policy. Our analysis suggests that there is room for more competition in the market. However, we also find evidence that competition might deteriorate quality. Therefore, in this section, we aim to present policies for which there is no (or only a limited) trade-off between competition and quality. This means that we seek policy options that stimulate competition and at least maintain the incentives to provide high-quality services. In addition, we suggest options for enhancing quality competition.

It is also possible to devise policies that emphasise one dimension at the cost of the other one. For instance, quality (competition) enhancing policies might be implemented even though they harm competition (quality). The decision to give more weight to one of the aspects - competition or quality - is, by and large, a political choice. In this section, we discuss, unless explicitly mentioned otherwise, those policies that are likely to do good on competition without substantially harming quality.

Another selection criterion for the policy suggestions is that they should be robust to the fact that we are unable to examine the most recent trends in the market. This implies that, even if competition should have increased somewhat in the most recent years it would still be useful to consider these policy options.

...on competition

Our finding is that the level of competition has been on the rise since 1999. However, at our latest points of measurement (2002, 2003) the level of competition is not higher than in 1995, 1996. This is particularly true for the local/consumer market. To enhance competition in ways that bear the least risk for quality two types of options are available. First, as is obvious from the bare facts and from our more structured estimation, there has not been much entry. Hence,

we present options to stimulate entry. Second, as entry has been sluggish, competition might be stimulated by broadening the market and search scope of consumers.

- Entry can be stimulated by:

1. Evaluating the role of the check on the business plan. The fact that a committee evaluates the establishment of a new notary practice may hinder entry in the market. Although, so far, only few business plans have been rejected, the business plan may still deter entry by discouraging candidates to apply. The primary motivation for this additional check on the business plan is to prevent bankruptcy among notary offices. As banks tend to evaluate a business plan only on a risk adjusted average return, this could lead to bankruptcies. In turn, too many bankruptcies in the notary sector could damage the trust that the public put in the notary. There is, however, additional financial oversight at the moment that a notary office is up and running.

   Candidates do express that the business plan check is an entry deterring institution. There is thus a trade-off between a possible damage of trust and an entry barrier. A policy option is to abolish the business plan requirement and to intensify financial supervision by the Bureau Financiëel Toezicht (BFT) in the first year(s) of a new office. An alternative is to examine the working of the commission that evaluates the plans, in order to guarantee that the procedure is not acting as barrier to entry.
2. Evaluating the ban on specialisation. The 'ministerieplicht', i.e the fact that each notary office has to offer full services, also tends to limit entry (and is experienced as such by candidates). *De facto* the *ministerieplicht* is not effective in banning specialisation, as notaries are free to price their services. Notaries can thus enter the market and then set a very high price for the service they do not want to provide. Hence, from an economic perspective, this is not a serious barrier to entry. However, surveys among junior notaries show that candidates perceive the *ministerieplicht* as a barrier. Candidates still feel that it is easier in practice to open a new office that is specialised in a few services because it requires a less broad knowledge. The motivation for the full services rule is that specialisation leads to fragmented knowledge and, hence, to suboptimal advice in the cases where there are complementaries between the services, that is when knowledge across different fields is necessary.[25] It is questionable, however, whether ten years of education are not sufficient to acquire this broad knowledge. On the other hand, specialisation generally leads to better quality if there are no substantial complementarities. And specialisation tends to favour entry. Given the possible opposite effects, a policy option in this area might run into the trade-off sketched above. Hence, a policy option is to abolish the *ministerieplicht* but at the same time to maintain educational requirements and improve quality supervision.

[25] Such complementaries can exist for instance between family law and real property services in cases of divorces.

We do not consider more drastic policies to stimulate entry in the profession such as abolishing the professional monopoly. First, these might damage the quality of the service. Second, shaking up the industry more considerably would increase uncertainty and might thereby make notaries more hesitant to enter. This holds to a lesser extent for the following suggestions as these affect incumbents directly:

- The search scope of consumers might be broadened, such that consumers also consider using notaries beyond their local market. This can be achieved by:

1. Making the consumers aware that it is possible, if the notary agrees, to sign a contract without actually being present in person at the office. At the same time consumers should be made aware of the possible costs in terms of quality that this implies. When the consumer is not present, he might not receive the same information as if he would actually visit the notary. The KNB could provide more information on these matters. Allowing notaries to offer 'digital' services for some of the most standard transactions would make customers more willing to use the services of a cheaper notary outside their city or local market.
2. Allowing notaries to provide their services outside their district on a permanent basis. For now, current regulation only allows the notary to provide his services outside his district if this has an 'incidental' character. Obviously, allowing notaries to work outside their district on a permanent term would also extent the relevant market for consumers.

... on quality

- Given the current concern for quality, there seems to be no reason to challenge the professional monopoly of notaries or the professional quality standards currently in place (education and training requirements). Loosening the professional standard or abandoning the professional monopoly of the notary is a type of policy that could stimulate competition at the cost of a deterioration of quality. Instead, professional standards appear to be justified by the presence of market failures, namely information asymmetry and external effects. Market mechanisms such as reputation and liability do not work sufficiently well in the notary market to solve these market failures. The strict training requirements guarantee that the professional has an expertise in the field. This can be seen as a control on the quality of the producer.
- From our theoretical discussion we learned that the economic incentives to provide optimal quality are not very strong. Thus, alongside the formal requirements, professional ethics, peer-group pressure and the like are important for quality. One important question, left unanswered in this report, is whether the introduction of competition is harmful to the professional ethics in the profession.
- Policies aiming to make quality public are difficult to implement in the notary market. Indeed, it is difficult to evaluate what legal quality entails. Given that it is difficult to assess all relevant

dimensions of quality of the notary product, measures of ‘naming and shaming’ do not seem appropriate to enhance the quality of notary services.

- The KNB (or some other institution) could play a role in raising consumer awareness of what quality of a notary entails. For instance, the KNB could provide a check list to the consumer on how to evaluate the quality of the notary services.
- Further enhancement of quality control seems welcome. The exact form of this quality control is beyond the scope of our research, but nowadays quality control seems rather fragmented. Hence, an independent authority that controls the production process could help to serve as quality safeguards. Product control (of the ‘legal quality’) is more difficult to organise.
- The risk of bankruptcy can affect the quality of services. Therefore, an option could be to control the financial situation of notaries and to implement rules that guarantee the solvency and continuity of notary services when the notary gets bankrupt. This process could be implemented in a more efficient way if the authority for financial supervision (Bureau Financiëel Toezicht) would be given more authority, for instance on filing complaints.

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Appendix A: Data Sources

The relative profit indicator

Statistics Netherlands provided us with the yearly Production Statistics over the 1996-2002 period. We selected individual firms falling under the SBI-code (Standaards Bedrijfs Indeling 1993) 7411.3 (=notary offices). We have firm-level data on profits and total revenues (in 1000 euros) over the whole period. Due to a change in the nomenclature of costs over the years, we had to reconstruct the variable costs as follows:

- 1996-1997: variable costs = personal costs + general costs
- 1998-2001: variable costs = firm costs
- 2002: variable costs = total firm charges - deductions on fixed assets - housing costs

For the local market estimations we linked the Production Statistics dataset to the 2001 General Firm Register (Algemene Bedrijfsregister) from Statistics Netherlands using the identification number of each firm. The General Firm Register dataset contains the address of individual firms. In this way, we could estimate the relative profit indicator at the local/city level.

The Bresnahan and Reiss indicator

- Professional services
  We obtained the addresses of notary services from the KNB Fikkert's 1995 and 2003 yearbooks. For our robustness tests, we also used the General Firm Register (Algemene Bedrijfsregister) dataset from the Center for Research on Microeconomic Data (CEREM) of Statistics Netherlands. The SBI (Standaards Bedrijfs Indeling) dataset of the CEREM contained information about the date of creation and, if applicable, the date of closing down of the business entity, the sbi-code, the 6-digit zip code and the house number. The business offices addresses were recorded on January 1st 2001, 2002, 2003 and 2004.
- Demographic and income data
  Data on the population, number of women, number of young people (0-19 years old), number of adults (20-64) and number of elderly (65+) and number of foreigners were available for the years 1998 to 2004 on Statline from Statistics Netherlands. We obtained these variables at the neighbourhood level (Wijken en Buurten Statistics). We do not have data on house prices for the year 1995. We use instead 1997 house price data. The 2003 neighbourhood data present a number of missing values that may biased our estimates.

We use instead 2001 neighbourhood data with the 2003 addresses obtained from the KNB.[26] Income data were not available after the year 2001.

- Nearby population

  We had access to a geographic map of all zip code areas in the Netherlands together with information on the surface, name place and municipality name within a GIS dataset.
  Using the GIS software MapInfo, we built up a distance matrix that reported all the distances from one zip code areas to every other possible zip code (from centre to centre). Using this distance matrix, we selected for every zip code all the zip codes areas that were located in a radius of 3km. By summing the population of these zip codes, we were able to construct the nearby population around every zip code areas. The nearby population is the population located within 3km of the zip code are, excluding the population of the central zip code self.

[26] Although demographic data at the zip code levels are also available, we prefer to use data at the neighborhood level because neighborhood data contain also income per capita and average house price information. These data are often missing at the zip code areas level. Moreover, we tested for the use of neighborhood data versus zip code data and found that entry thresholds estimates were very similar

Appendix B: the Bresnahan and Reiss indicator

The model

The intuition of the Bresnahan and Reiss indicator is that a fall in profits due to an increase in competition implies that firms will require a larger market size in order to remain profitable. In other words, Bresnahan and Reiss use this critical market size level as a proxy for profitability. When profits per transaction fall, firms need to sell their products to a larger number of consumers. The critical number of consumers required for an extra firm to be profitable is called an entry threshold.

More formally, we define profits (Π) for a single firm as:

$$\Pi = V(k, P, e)\frac{S(z)}{k} - F(k) \tag{7.1}$$

where *V* denotes the variable profit margin per consumer which depends possibly on the price (*P*) and on effort (*e*). Variable profit margins also vary with the number of firms operating in the market (k), that is: the more firms in the market, the lower the variable profit margin. The total number of consumers in the market *S* is a function of a vector *z* of demand shifters. Fixed costs are also assumed to vary with *k*, i.e. sunk costs or entry barriers tend to increase with the number of firms in the market. Firms are assumed to be symmetric within the same market and the profits of an individual firm in a monopoly, duopoly or triopoly market $k \in \{1,2,3\}$ are defined as

$$\Pi_k = V_k \frac{S(z)}{k} - F_k \tag{7.2}$$

What we want to know is how much competition affects the variable profit margin. The innovation of Bresnahan and Reiss is to assume profit maximisation by optimising on the location choice.[27] The Nash equilibrium occurs for $\Pi_{k,n} = 0 \; \forall \; n$, where *n* indicates a local market, the ratio of the critical market size of markets with *k* and *k*+1 firms provides an indication for competition:

$$\frac{S_k}{S_{k+1}}\frac{k+1}{k} = \frac{V_{k+1}}{V_k} \tag{7.3}$$

[27] In the exposition we use a zero-profit condition for simplicity. Profit maximisation is sufficient for the method to be informative.

The left-hand side of equation (3.4) (referred to as the entry threshold) is observable and indicative of how competition affects variable profits.[28] A ratio equal to one, indicates perfect competition or joint monopoly behaviour as variable profitability does not change with entry of an additional firm. If the ratio is larger than one, entry causes variable profits to decrease and thus firms compete. As the number of firms increases further and the entry thresholds ratio gradually declines to unity we are getting closer to the competitive equilibrium.

To obtain the entry thresholds, we estimate an ordered-probit model, using maximum likelihood, to find the critical population size. The model treats firms profitability as a latent variable, and uses information on the number of entrants as a proxy, under the assumption of free entry and under the assumption that the new entrant breaks even at zero profits. The probability of observing markets with no firms equals:

$$\Pr(N = 0) = \Pr(\Pi_1 < 0) \tag{7.4}$$

where Π_1 is the monopolists' profit. The probability of observing k firms in equilibrium equals:

$$\Pr(N = k) = \Pr(\Pi_k \geq 0 \cdot and \cdot \Pi_{k+1} < 0) \tag{7.5}$$

This means that profits are positive when there are k firms but negative when there would be k+1 firms. We adopt a functional form of profits used by Genesove (2002). This choice is motivated by the fact that it is simpler to estimate than the original functional form of Bresnahan and Reiss. We take

$$\Pi_k = \alpha \ln S + X'\beta + \delta_k + \varepsilon \tag{7.6}$$

where S is the market size and X are the other explanatory variables. The cut points (δ_k) of the estimation capture the effect of the number of firms in the market on profits. According to the free entry condition there will be at least k firms in the market if

$$\Pr(N \geq k) = \Phi(\Pi_k^* \geq \varepsilon) = \Phi(\delta_k - \alpha \ln S - X'\beta) \tag{7.7}$$

where $\Phi(.)$ is the normal cumulative function and δ_k is the value of the k^{th} cut point estimated in the ordered probit. We are interested in the market size that is necessary to support a specific number of firms. Since an additional firm enters the market as soon as it is able to break even, the threshold value coincides with profits equalling zero. Hence, we solve for the minimum

[28] We assume identical fixed costs for a monopolist, a duopolist and a triopolist. Bresnahan and Reiss (1991) allow for differences therein for many professions. The results are not substantially affected by this.

population necessary to support the k^{th} firm in a local market, assuming that the market has mean values of the other control variables (X). Analytically, we get

$$S_k = \exp\left((\delta_k - X'\beta)/\alpha\right) \tag{7.8}$$

We find the entry threshold per firm by computing $s_k=S_k/k$. The entry-threshold ratio is then s_{k+1}/s_k.

Robustness checks

We tested further for different specifications of the ordered-probit estimations. Table 9.1 presents these results. Specification (1) considers the same sample of markets as in section 5.1 and adds the DIST1 variable, which accounts for the number of kilometres to the next market with a least one notary. In this way, we allow for markets that are interrelated with one another. Specification (2) includes the number of firms established in every market and the ratio of owned houses on rented houses. Specification (3) extend our sample of markets and includes also local markets which are located within 20km of a city of 100000+ inhabitants. Finally, specifications (4) and (5) are based on the General Firm Register dataset from Statistics Netherlands for the year 2001.

Robustness tests, (1) = KNB datasets including DIST1, (2) KNB dataset including number of firms and % owned/rented houses in local markets, (3) KNB datasets including markets which are within 20km of a city of 100000+, (4) CBS dataset, (5) CBS dataset including DIST1

	KNB	KNB	KNB	KNB	KNB	CBS	CBS
	1995	2003	2003	1995	2003	2001	2001
	(1)	(1)	(2)	(3)	(3)	(4)	(5)
N	510	510	507	777	777	510	510
LNPOP	1.14***	1,45***	1.41***	1.16***	1.49***	1.31***	1.30***
	(0.09)	(0.12)	(0.12)	(0.07)	(0.09)	(0.11)	(0.11)
LNPOP3KM	0.02	0.02	0.003	0.009	– 0.004	0.03	0.03
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
INC	0.83***	0.37***	0.38***	0.47***	0.29***	0.32***	0.32***
	(0.16)	(0.09)	(0.09)	(0.12)	(0.08)	(0.09)	(0.09)
OLD	0.6	2.8	5.3	3.6	4.5	0.56	– 1.16
	(3.4)	(3.5)	(3.4)	(2.4)	(2.8)	(3.5)	(3.7)
YOUNG	3.2	1.6	3.3	4.0	4.4	– 3.8	– 4.9
	(3.6)	(3.8)	(3.7)	(2.6)	(2.9)	(3.9)	(3.9)
HOUSE	– 0.016***	– 0.006	– 0.005	– 0.009***	– 0.008***	– 0.006**	– 0.006**
	(0.005)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
DIST1	0.073***	0.083***					0.04*
	(0.02)	(0.03)					(0.02)
FIRMS			0.05				
			(0.10)				
OWNED/RENTED HOUSES			– 0.04				
			(0.08)				
Log-likelihood	– 173	– 155	– 160	– 289	– 252	– 160	– 158
S1	5896	5411	6183	5755	5766	6569	6389
S2	15548	14883	16607	15835	15656	13361	13192
S2/s1	2.63	2.75	2.68	2.75	2.71	2.03	2.06

In the previous estimations, we estimated entry thresholds for all notaries' offices assuming constant efficient scale. 'The KNB yearbooks also contain information on the number of notaries in each office. Here, we therefore estimate thresholds for offices with exactly the same scale that is with the same number of notaries per office. We compare the entry threshold of a monopoly office employing 1 notary with the entry thresholds of duopoly offices employing each one notary. Table 9.2 provides the estimations results.

Estimating production structure and competition simultaneously		
	1995	2003
	N=489	N=489
$S_{1,1}$	7493	5540
$S_{2,1}$	43656	31324
Entry threshold per notary		
$s_{1,1}$ (threshold to support a 1-notary monopoly office)	7493	5540
$s_{2,1} = S_{2,1}/2$ (threshold to support two 1-notary duopoly offices)	21828	15662
Entry threshold ratio		
$s_{2,1}/s_{1,1}$	2.91	2.83

Appendix C: Principal Component Analysis

Principal Components

Component	Eigenvalue	Difference	Proportion of Variation Explained	Cumulative Variation Explained
1	7.471	6.153	0.340	0.340
2	1.317	0.068	0.060	0.400
3	1.249	0.211	0.057	0.456
4	1.039	0.057	0.047	0.504
5	0.982	0.071	0.045	0.548
6	0.911	0.018	0.041	0.590
7	0.894	0.084	0.041	0.630
8	0.809	0.038	0.037	0.667
9	0.771	0.098	0.035	0.702
10	0.673	0.025	0.031	0.733
11	0.648	0.032	0.030	0.762
12	0.617	0.038	0.028	0.790
13	0.579	0.035	0.026	0.816
14	0.544	0.018	0.025	0.841
15	0.526	0.030	0.024	0.865
16	0.496	0.022	0.023	0.888
17	0.474	0.019	0.022	0.909
18	0.455	0.016	0.021	0.930
19	0.439	0.043	0.020	0.950
20	0.397	0.040	0.018	0.968
21	0.357	0.006	0.016	0.984
22	0.351		0.016	1.000

Eigenvectors

Variable	Eigenvector 1	Eigenvector 2	Eigenvector 3	Eigenvector 4
Q1	0.197	– 0.090	0.218	– 0.079
Q2	0.174	– 0.078	0.448	0.023
Q3	0.200	0.119	0.237	– 0.134
Q4	0.156	0.445	0.328	– 0.217
Q5	0.114	0.522	0.220	– 0.146
Q6	0.160	0.121	0.153	– 0.037
Q7	0.239	– 0.137	– 0.040	– 0.170
Q8	0.244	– 0.060	– 0.169	– 0.250
Q9	0.237	0.070	– 0.129	– 0.114
Q10	0.217	0.062	0.050	– 0.029
Q11	0.235	– 0.282	– 0.060	– 0.234
Q12	0.242	– 0.191	– 0.105	– 0.250
Q13	0.257	– 0.088	– 0.240	– 0.089
Q14	0.243	– 0.271	0.121	– 0.021
Q15	0.216	– 0.235	0.251	0.306
Q16	0.220	– 0.215	0.257	0.284
Q17	0.220	0.076	– 0.224	– 0.030
Q18	0.156	0.254	– 0.258	0.024
Q19	0.234	0.167	– 0.252	0.015
Q20	0.249	0.085	– 0.233	0.187
Q21	0.211	0.082	– 0.024	0.460
Q22	0.200	0.210	– 0.131	0.502