

PATENT AGENCIES AND PATENTING IN SWEDEN 1885-1914

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Abstract

In this article we argue that institutional change in Sweden such as the new patent legislation of the 1880s created a larger market for patent agencies by making it harder for inventors and firms to use the patent system by themselves. Although foreign patenting already required the use of agents, we show that the new patent law of 1884 significantly increased the use of agents domestically. Using patent data from a unique dataset comprising 1/3 of all patents granted in Sweden 1885-1914 (in total 14,772 patents) and with archival data from three leading patent agencies we show that patent agents played an instrumental, but hitherto neglected, role in firms' and inventors' use of the new property rights system, that just had been put into effect. Our findings demonstrate that patent agents were tightly intertwined with different actors using the patent system in different networks. We also find slightly higher quality, in terms of lifetime, of the patents that used a patent agent. In contrast to previous studies in the U.S., we show that a few large patent agencies remained dominant in the market over the entire period in Sweden. These findings show that intellectual property rights intermediaries, such as patent agencies needs to be accounted for in analyses of firms' technology strategies and more general economic and technological change involving property rights systems.

INTRODUCTION

Sweden, just as many other countries in Western Europe went through a substantial industrialization in the end of the 19th century. The period is often referred to as the ‘second industrial revolution’¹ as new conditions for development and growth were created through science, engineering and institutional innovation. Inventions were in the center of this development and Swedish firms were founded on inventions such as the modern lighthouse (AGA), the Ericsson telephone (LM Ericsson), the separator (Alfa Laval), three-phase electrical systems (ASEA) and roller bearings (SKF). There was also a development of the banking system that made financing of these firms possible through the creation of a market for venture capital. All in all, the period around 1880-1910 was a breakthrough for Swedish growth that in many ways laid the foundation for contemporary Swedish welfare. For example GDP growth 1890-1910 in Sweden were higher (2,4 %) than both the US (2,0 %) and Japan (1,4 %) during the same time².

In a recent article on the Japanese market for technology Nicholas and Shimizu reach the conclusion that an institutional evolution through the development of patent law and the rise of patent agents as intermediaries suggests “*a causal relationships between patents, a market for ideas and economic growth*”³ through a “*division of labor between inventors and those who were more able to perform legal or commercial functions in a way that created incentives for innovation.*”⁴ Lamoreux and Sokoloff have reached similar conclusions with US data in several articles⁵. Furthermore, in a recent article, which summarizes data on several countries, Khan writes that “*In accordance with endogenous growth models, the historical experience in international markets for patents indicates that trade in patents and technological capabilities were not exogenous. Innovation markets responded to the*

¹ For more on Sweden during this period see: Schön, L. 1. (2000). En modern svensk ekonomisk historia : tillväxt och

² Sweden 2,4%; Other Nordic countries 1,7%; UK 0,9%; Rest of Europe 1,4%; North America 2,0%; Japan 1,4 % (annual GDP growth rates) Data from Maddison (1995) in Schön, L. 1. (2000). En modern svensk ekonomisk historia : tillväxt och omvandling under två sekel. Stockholm : SNS förlag, pp. 223.

³ Nicholas, T., & Shimizu, H. (2013). Intermediary Functions and the Market for Innovation in Meiji and Taishō Japan. *Business History Review*, 87(01), 121–149, pp. 148

⁴ *Ibid.*, pp. 148

⁵ See for example: Lamoreux & Sokoloff, “Inventive Activity And The Market For Technology In The United States, 1840-1920” in Lamoreaux, N. R., Raff, D. M. G., & Temin, P. (1999). *Learning by Doing in Markets, Firms, and Countries*. University of Chicago Press., Lamoreux & Sokoloff, “Intermediaries in The U.S. Market For Technology , 1870-1920” in Engerman, S. L., & Davis, L. E. (2003). *Finance, Intermediaries, and Economic Development*. Cambridge University Press., Lamoreaux, N. R., Sokoloff, K. L., & Sutthiphisal, D. (2013). Patent Alchemy: The Market for Technology in US History. *Business History Review*, 87(01), 3–38. doi:10.1017/S0007680513000123.

*incentives that institutional and organizational rules and standards provided.”*⁶

In this article we focus on these actors, the intermediaries, that were active in all of the above-mentioned processes, but have so far been somewhat neglected in business and economic history as well as contemporary research on management and economics of innovation⁷, namely patent agents and patent agencies. There are many different terms used to describe this type of intermediaries and there does not seem to be a lot of consistency in the literature. Terms as attorney, lawyer, solicitor and agent are often used interchangeably⁸. In the article we use the term patent agent as a collective term for all of these individual roles and use the term patent agencies for the firms that employed them. The article covers the period 1885-1914 starting with the new Swedish patent law legislated in May 16, 1884 and which came into force January 1, 1885. We argue that these intermediaries played an important role in the creation of a Swedish market for patenting and technology during the ‘second industrial revolution’. All agencies examined in this article are still active today, in some cases in the same form and name as during the period discussed here, while some have gone through various mergers and acquisitions⁹.

To give an economic example of the importance of these actors today the Swedish Patent Office (PRV)¹⁰ estimates that the cost for a single inventor to apply for and uphold a Swedish national patent for 11 years currently is about SEK 100,000-120,000 (approximately USD 15,000-18,000 or EUR 11,000-14,000). In their calculations approximately 70-75 percent (SEK 75,000-85,000) of that amount are costs for the services of the patent agent. In other

⁶ Khan, B. Z. (2013). Selling Ideas: An International Perspective on Patenting and Markets for Technological Innovations, 1790–1930. *Business History Review*, 87(01), 39–68. doi:10.1017/S0007680513000135, pp. 66.

⁷ Gambardella, A., Giuri, P., & Luzzi, A. (2007). The market for patents in Europe. *Research Policy*, 36(8), 1163–1183.

Arora, A., & Gambardella, A. (2010). Ideas for rent: an overview of markets for technology. *Industrial and Corporate Change*, 19(3), 775–803. Both these articles discuss the market for technology without mentioning intermediaries.

⁸ A good discussion on the various terms used can be found in: Swanson, K. W. (2009). The emergence of the professional patent practitioner. *Technology and Culture*, 50, 519–548. *“During most of the time period discussed in this article, roughly 1836 to 1938, qualifications for what today we call “patent attorneys” and “patent agents” were unspecified, or very loose. I use “patent practitioner” as a trans-historical catchall term to refer to what were variously called “patent solicitors,” “patent agents,” “patent counsel,” “patent attorneys,” and “patent lawyers” during this first century of the modern patent system. These terms reflected a persistent nomenclatural muddle among all legal actors in the United States—a muddle created by borrowing terminology from Great Britain without also borrowing the associated distinctions in role; see Lawrence M. Friedman, A History of American Law, 3rd ed. (New York, 2005), 235. Thus “solicitor,” “counsel,” “attorney,” “lawyer,” and “attorney-at-law” all had popular associations with legal training and expertise, although the terms had shifting meanings over the decades. When chosen by patent practitioners themselves, these terms also bore some relation to practitioners’ self-perceptions of their roles: to solicit patents (solicitor), to act as the inventor’s agent in legal dealings with the patent office (agent or attorney), to provide counsel (counsel), to engage in legal proceedings and advocacy, and to assert or defend a patent (attorney, attorney-at-law, or lawyer).”* pp. 520.

⁹ For example: LA Groth & Co (1869, 144 years), Zacco (1878, 135 years), Valea (formerly Dahl’s Patent Agency) (1894, 119 years)

¹⁰ Patent- och Registreringsverket. See www.prv.se ”Kostnadsexempel”

words the external costs of the patent system today are fairly large¹¹. Below we show that the current situation can be traced back to institutional and industrial development that took place during the ‘second industrial revolution’ in Sweden around 1880-1910.

Patent Data

Figure 1 shows the development of patenting activity in Sweden between 1870-1914. As can be seen a decrease in patenting occurred in 1885, which is probably because potential patent applicants held on to their applications in 1884, waiting for the effectuation of the new patent law. After 1885, however, there was continuous increase in patenting activity. There was also a relative increase in patenting in comparison to other countries (see figure 2) possibly corresponding to higher GDP growth in Sweden during the same time. From low levels of patenting in 1885, Sweden caught up with both the US and Germany during the period. Only Japan could match Sweden in patenting growth rate, as both experienced an 830 percent increase in patenting between 1885 and 1904¹². This number is consistent with Nicholas and Shimizu’s findings concerning Japan’s development¹³.

[FIGURE 1 about here]

[FIGURE 2 about here]

Figure 3 shows the number of active patent agents and agencies during the period 1885-1914. The data was compiled from the archives of the Swedish Patent Office. The official register does not contain information on agents, but the “working” register used by the patent examiners contains this information along with all other necessary information about the patent and it was kept “alive” as long as the patent in question was in force. Important information include for example patent fees paid, ownership changes and so forth. During the period 38,190 patents were granted in Sweden and our data set contains a 1/3 random sample of all the entries in this working register, in total 14,772 patents¹⁴. Not surprisingly, there is an increase in the number of patent agents as the actual patenting activity increases. More surprising is the very sharp drop in patents granted to individuals or firms not using a patent

¹¹ For a firm with three employees the figures are SEK 150,000-300,000 and 90,000-120,000 respectively and for a larger firm the figures are SEK 400,000-800,000 and 100,000-180,000 respectively.

¹² Tisell, H. G. (1907). Internationell patentstatistik för åren 1885-1904.

¹³ Nicholas, T., & Shimizu, H. (2013). Intermediary Functions and the Market for Innovation in Meiji and Taishō Japan. *Business History Review*, 87(01), 121–149. 130.

¹⁴ We have a full sample of 1885-1891 due to low patenting rates.

agent (see Figure 4). This is perhaps best interpreted as a reaction to more rigorous administrative demands and novelty searches by the Patent Office discussed below. This leads us to the question who these patent agents and agencies were.

[FIGURE 3 and 4 about here]

A closer examination of the data on a more disaggregated level (see Figure 5) reveals that this market was by and large controlled by a few major agencies. The apparent stable, almost oligopolistic, structure of this market calls for further study of: a) the emergence of such this market structure and the factors influencing its emergence; b) what firms that emerged as leading patent agencies; and c) the patent agencies role and position in the market. Very few studies of markets for patent agencies exist and to our knowledge there is no other comparable data on the whole sector of patent agencies. Tom Nicholas and Hiroshi Shimizu present quantitative data on patent attorneys in two recent articles and so do Lamoreux and Sokoloff, but their data is more aggregated or in a cross section format respectively¹⁵. It does not show who these actors were in more detail and you cannot see any differences in market share. Overall, the above-mentioned studies focus more on markets for technology than the patent agents per se. In the present study, we focus more on who these agencies were and how they became such important actors. The article is structured as follows: first we present the institutional setting of Sweden, its patent system and the new patent law of 1884. Next we present data on the two largest patent agencies during the time and show how they were very well suited to take advantage of the opportunity created by the new patent law. We continue with data on patent quality and the foundation of the Swedish Patent Agent Association. We end with a discussion.

[FIGURE 5 about here]

INSTITUTIONAL BACKGROUND

The first Swedish patent law goes back to 1668 (then called *privilegia exclusiva*), although between the years 1782-1819 no such privileges seem to have been granted. The next law

¹⁵Nicholas, T., & Shimizu, H. (2013). Intermediary Functions and the Market for Innovation in Meiji and Taishō Japan. *Business History Review*, 87(01), 121–149., Nicholas, T. (2013). Independent invention during the rise of the corporate economy in Britain and Japan1. *The Economic History Review*, 64(3), 995–1023., Lamoreux & Sokoloff, “Inventive Activity And The Market For Technology In The United States, 1840-1920” in Lamoreaux, N. R., Raff, D. M. G., & Temin, P. (1999). *Learning by Doing in Markets, Firms, and Countries*. University of Chicago Press.

came into force 1819 and was followed by another in 1834, which exchange the word “privilegium” for “patent” for the first time. A third law was constituted in 1856, but it still did not contain any demands for novelty searches and claims. However, after a Royal Commission on patents in 1878, Sweden’s first modern patent law was legislated in parliament 1884 and enacted January 1, 1885. The most important difference from earlier patent laws was that it now required a rigorous novelty search before a patent was granted. It differed from the American system in the same way as the German did¹⁶ i.e., that patents could not only be granted to the first and true inventor but to the first person to file an application. The Patent Office also had the power to immediately reject an application if it was obvious that it was not new. Another difference from the American system and similarity to the German system was the fee structure. While the American only had a one-time application fee, the Swedish renewal fee structure was increasing. The application fee was set to SEK 50 and the renewal fee was increasing in two steps, SEK 25 for every additional year up to the sixth year, SEK 50 for every year up to the tenth year and SEK 75 from the tenth to the fifteenth. Later on, due to complaints from the Inventors’ Association¹⁷ and the well-known Solomon August Andrée¹⁸, the application fee was lowered to SEK 20 in 1894¹⁹. As such, to keep a patent in force for the maximum of fifteen years in 1914 cost SEK 745. According to official Swedish statistics this equals about SEK 34,000 in 2013 nominal value²⁰. The cost to keep a patent in force for the same time period today is very similar and approximates SEK 37,000²¹. Regarding foreign patenting in Sweden non-Swedish residents were according to the 1834 law forced to move to Sweden within a year or transfer the patent to a Swedish citizen. The patent law from 1856 did not have this clause, but stated that in the case that the patentee did not live in Sweden he had to apply for a patent through an agent with the power of attorney, who would represent him in all issues regarding the patent. The law from 1884 contained the same statement.²² As such, a market for foreign patenting already existed and where the patent agencies filled an important role. Figure 6 shows that foreign patenting in Sweden during the period was relatively stable around 55-60 percent of total patents granted.

¹⁶ Burhop, C. (2010). The transfer of patents in Imperial Germany. *Journal of Economic History*, 70(4), 921.

¹⁷ *Uppfinnarföreningen*

¹⁸ The world famous polar explorer, who also was Head Engineer of the Patent Office 1884-1897

¹⁹ Avelius, (1968). *Patentverket från gamla tider till nu: (1885-1967/68)*. (n.d.).

²⁰ Statistiska Centralbyrån, 2013

²¹ Authors’ own calculation from PRV’s prices (see www.prv.se “Payment and Fees”)

²² Zacco (1928). *Hur enligt svensk rätt ordnats med ombudsskap på det industriella rättsskyddets område*.

[FIGURE 6 about here]

PATENT AGENTS: INSTITUTIONAL INFLUENCE, NETWORKS AND PRICE CONTROL

Who were the entrepreneurs that founded the early patent agencies in Sweden?²³ Firstly, one distinct difference in comparison with Nicholas and Shimizu's²⁴ data from Japan can be detected by looking at the entries of the patent register, which often mentions the work title of the agent (engineer, accountant etc.). According to their article the patent attorneys in Japan during the same period "[t]he majority of attorneys that were practicing during the 1890s had no technical knowledge or legal expertise."²⁵ In contrast, the patent agents of Sweden were to a large majority engineers, especially in the larger patent agencies²⁶. As token evidence, the owner of one of the largest agencies, Groth & Co, John Edberg even took out a patent himself in 1888 on a mechanical centrifuge²⁷. Secondly, in contrast to Lamoruex and Sokoloff's findings²⁸, that indicate that the importance of patent agencies diminished to make room for more general and individual business agents figure 5 shows that the Swedish markets for patenting was dominated by a few large agencies over a long period of time and the same can also be said for the market for technology. Figure 7 shows the total share of patent transfers handled by the largest patent agencies.

[FIGURE 7 about here]

The cases of L. A. Groth & Co and Stockholms Patentbyrå Zacco & Bruhn

To show the institutional influence of the patent agencies at the time, we present some historical evidence pertaining to the founders of the two largest patent agencies during the second industrial revolution: *L.A. Groth & Co* and *Stockholms Patentbyrå Zacco & Bruhn*, founded 1869 and 1878 respectively. Lorentz Albert Theodor Groth was a road and water construction engineer from the region of Värmland, who had worked for SJ, the state owned railway company, before he arrived to Stockholm in 1869. Together with Axel Herman Weström he founded L. A. Groth & Co, which in the beginning was supposed to be both a

²³ Three of the four largest agencies today are the same as during 1885-1914 according to Retriever database.

²⁴ Nicholas, T., & Shimizu, H. (2013). Intermediary Functions and the Market for Innovation in Meiji and Taishō Japan. *Business History Review*, 87(01), 121–149

²⁵ Ibid. pp. 141

²⁶ Working patent register of the Swedish Patent Office, (1885-1914). In most cases the agents' titles are mentioned in the register and an overwhelming majority are described as some type of "engineer" or "civil engineer".

²⁷ See Swedish patent No. 1662

²⁸ Lamoruex & Sokoloff, "Intermediaries in The U.S. Market For Technology , 1870-1920" in Engerman, S. L., & Davis, L. E. (2003). *Finance, Intermediaries, and Economic Development*. Cambridge University Press

trading firm and a patent agency, since patenting in Sweden during the 1870s were modest not even reaching 200 patents per year (see figure 1). However, soon they added the prefix “Patent agency” to the firm name indicating that the agency part of the business quickly became the main source of revenue.²⁹ Groth soon became a central figure in the early Swedish intellectual property rights community. Among other things he was the government’s representative at the international patent congress in connection with the World Fair in Vienna 1873. There Groth became an elected member of the “Permanent international committee for industrial property rights” and he continued his work at the World Fair in Paris 1878 and the adjunct international patent congress. His report³⁰ to the government from the congress was printed and circulated in the important industrial magazine *Industritidningen Norden*³¹. Groth & Co also produced the first Swedish patent statistics as a service to its customers and the “industrious man” in general. Their publication covered both Sweden and Norway between the years 1866-1875. L. A. Groth wrote the following in the foreword:

“Until now there have been missing a, for Sweden and Norway, complete list for patented inventions over a longer period of time. The Scandinavian Patent Agency has therefore believed to be doing the industrious man a favor by putting together the present collection covering the last 10 years and based on official sources.”³²

In a way then, Groth & Co filled the role of the soon to-be-created Patent Office, representing the government at international congresses and producing statistics, likely anticipating the coming changes of the new patent law.

Zacco & Bruhn was founded in 1878 by Ernst Hjalmar Bruhn an engineer from central Sweden who moved to Stockholm in the 1870s, where he started working for the above-mentioned industrial magazine *Norden*, where his friend P. Lindell was the editor. In 1880 K. Y. Zacco, also an engineer, entered the firm and together they also ran a machine agency together with the patent agency business. *Zacco & Bruhn* also quickly become somewhat of a green house for patent agents and people working with intellectual property³³. This is evident

²⁹ LA Groth & Co (1969), LA Groth & Co 100 år.

³⁰ Groth, L.A., ”Internationella Patent-Kongressen i Paris 1878: berättelse till chefen för kongl. Civil-departmentet”. (Stockholm, 1879).

³¹ LA Groth & Co (1969), LA Groth & Co 100 år.

³² LA Groth & Co, (1876). Förteckning öfver patenter beviljade i Sverige och Norge under åren 1866-1875. Forsete, Stockholm. pp. preface.

³³ Similar phenomena for the US are described in Swanson, K. W. (2009). *The emergence of the professional patent practitioner. Technology and Culture*, 50, 519–548 and Cooper, C. C. (1991). *Social Construction of Invention through Patent Management: Thomas Blanchard's Woodworking Machinery. Technology and Culture*, 32(4), 960–998.

if you look at a list of where former employees between 1883-1918 of the agency went later on in their career. No less than eight persons went on to found their own patent agencies, four went on to work at the Patent Office and six were employed by other agencies or went to patent departments in firms.³⁴ As such, Zacco & Bruhn had access to a wide domestic network.

In terms of international networks, data from Groth & Co's register over patent applications show that they had almost daily contact with foreign patent agencies. As an example the entries from January, 1891 show three patents each from foreign agents R. Lüders and V. Eberth³⁵. The connection was thus not from foreign inventor to Swedish agency but from foreign inventor-foreign agency-Swedish agency. In terms of network analysis³⁶ this would give Groth & Co the roles of both "gatekeeper" and "liaison", where "gatekeeper", as the word suggest, refers to the agencies giving foreign firms and inventors access to the Swedish market and "liaison" referring to Swedish agencies acting as a link to international markets for domestic patentees.

Business influence

One of the most important aspects to consider is if patent agencies did more than just serve an administrative role of drafting patents and filing them at the Patent Office. Evidence from literature indicates that their role was much more business oriented and that they indeed could influence firms, inventors and the legal environment (see for example Beauchamp on Bell and AT&T, Cooper on Thomas Blanchard and Swanson on Thomas Edison)³⁷. In a 1906 report to Stockholms Allmänna Telefonaktiebolag (later on merged with LM Ericsson) the patent agency *Delmar & Co* wrote the following regarding the Swedish patent 14,791³⁸:

"A similar device for the signaling was however by the time for the application of patent No. 14,791 no longer new. Owing to the American patent No. 587,406, published August 3, 1897, the same invention I already patented and published.../.../...With regard to mentioned American patent No. 587,406 it is our opinion that patent claim 1 in patent

³⁴ Zacco & Bruhn (1928). Minnesskrift.

³⁵ LA Groth & Co archive, Ansökningsbok 1891-1895.

³⁶ Gould, R. V., & Fernandez, R. M. (1989). Structures of Mediation: A Formal Approach to Brokerage in Transaction Networks. *Sociological Methodology*, 19, 38. doi:10.2307/270949

³⁷ Cooper, C. C. (1991). Social Construction of Invention through Patent Management: Thomas Blanchard's Woodworking Machinery. *Technology and Culture*, 32(4), 960-998., Swanson, K. W. (2009). The emergence of the professional patent practitioner. *Technology and Culture*, 50, 519-548., Beauchamp, C. (2010). Who Invented the Telephone?: Lawyers, Patents, and the Judgments of History. *Technology and Culture*, 51(4), 854-878.

³⁸ Patent No. 14,791

No. 14,791 undoubtedly must be declared invalid in a potential litigation process.”³⁹

It is likely that the above role as advisors could influence the patenting strategies of firms trying to navigate international technology and product markets. That the patent agencies also performed service more similar to business consultancies is also clear from several publications from different agencies. One example is from a “Handbook For Patent Applications” published by the *Dahl Patent Agency* in 1902. In the handbook patent agent Dahl clearly states:

“Inventions in general seldom become as profitable as the inventor usual believes.../.../...They do not consider that the patent itself holds no value, but that the value is to be found in the sale of the invention made and the protection that the patent can give against the imitation by others.../.../...it is required that the invention is exploited in a proper manner and this is where the inventor usually fails.”⁴⁰

Did patent agents produce higher quality patents?

Comparing the average lifetime of patents in the sample shows that patents prepared by a patent agent had almost a 20 percent longer lifetime, almost a whole year (see Figure 8). However, this result needs to be interpreted carefully. An alternative explanation could be that inventors and firms with more financial resources or even better inventions, perhaps due to better preparations and testing, more often employed patent agents, thus resulting in that patent agents overall had access to higher quality inventions. Another possibility is that patent agents themselves sought out inventions they believed could be patented, as such acting as a filter for better inventions where the patent could be held in force for longer periods of time.

[FIGURE 8 about here]

The Swedish Association Of Patent Agents

In 1884, the same year that the Swedish parliament passed the new patent law, patent agencies *Zacco, Groth* and *F.L. Enquist* together formed *The Swedish Association of Patent Agents* (SPOF⁴¹). The by-laws indicated that the goals of the association was, amongst others,:

“...to work towards a collegial relationship between agents, to work for a good collaboration between patent agents and the Patent Office and its clerks, to work against unhealthy competition between patent agents.../.../...to try and achieve suitable changes regarding current legislation and international agreements concerning industrial property rights and working regulations of the Patent Office”⁴²

³⁹ LM Ericsson archive, Box F2:1 ”Patent documents”. Centre for Business History.

⁴⁰ Dahl, O., (1902). Handbok för patentsökande. Stockholm.

⁴¹ Svenska Patentombudsforeningen (see: www.spof.se)

⁴² Zacco (1928). Hur enligt svensk rätt ordnats med ombudsskap på det industriella rättsskyddets område.

In the end, as evidence from the Groth & Co's archives show, this in practice meant price controls and an oligopolistic market for patenting (see Figure 4). Prices concerned included drafting of patents, translations and other services.

"Between the signees, members of the Swedish Association of Patent Agents, the following agreement has been made regarding minimum prices and normal prices for the drafting of patents and thereby connected business."⁴³

That this was also the perceived view by the competition during the time is clear when reading this foreword from a handbook published by the Dahl Patent Agency (not a member of the SPOF):

"As I am not a member of the Patent Agent Association, since I am not in favor of guilds, I have the liberty to demand only as high a price as the performance of a good work allows me to"⁴⁴

Owing to both Groth & Co's and Zacco's strong positions in the market before the new patent law it is likely that they were well suited to foresee the changes and take advantage of them, one way being through the SPOF and taking control over an anticipated larger market for patents.

Summing up this section we have tried to show that a few patent agencies were well positioned to take control over the increasing market of patenting after the new patent law 1884. They were educated engineers, representatives for the Swedish government, had worked extensively with intellectual property regulations and had built up large networks both domestic and internationally. These networks were at least not as easily accessible without a patent agent and as such patent agents got powerful roles as *gatekeepers* and *liaisons* in the patent system. Furthermore, the foundation of the SPOF made it possible for the big patent agencies to collaborate and use price controls to further their positions and also to lobby the new government institution the Patent Office.

DISCUSSION

In her article *The Emergence of The Professional Patent Practitioner* Swanson suggests that to a large extent the emergence of patent agents in the U.S. was an "*unintended consequence*

⁴³ "SPOF price list", L A Groth & Co archive.

⁴⁴ Dahl, O., (1902). Handbok för patentsökande. Stockholm., pp. preface.

of the [US] Patent Act of 1836⁴⁵” and that “[i]n creating the first formal patent office staffed by full-time examiners, the act provided a niche for a new kind of expertise in drafting patents and negotiating their acceptance with the patent office bureaucrats⁴⁶”. The same can be said for Sweden or at least the increase in the importance and power of the patent agencies. The patent law of 1884 produced two results that both favored the business of patent agents. Firstly, the more rigorous novelty search and higher demands on the formality of the patent applications arguably made it harder for inexperienced individual inventors to manage their applications by themselves. Figure 4 shows that the extent to which inventors and firms handled their own patent applications decreased significantly after the new patent legislation came into force January 1, 1885. Secondly, the clearer and more secure property rights that the new law stipulated helped increase the patenting rate considerably (see figure 1), in line with previous findings from the US⁴⁷. Since the patent fees constituted a large portion of patent agencies’ revenues, it should have been in their best interest to increase the overall propensity to patent. Moreover, the business associated with patenting, such as the sale of patents and inventions could also be positively related to patent agents helping inventors and applicant firms’ increase their propensity to patent, although we cannot prove any casual relationship between patent agencies and patent count. Furthermore, data indicate that the patent agencies, due to their experience, networks and general knowledge of the patent system were in a very good position to take advantage of the changes taking place. For example, three of the largest agencies together formed the SPOF, an association that included cartel like agreements on minimum prices and lobbying of the Patent Office in the best interest of its members. This is in contrast to Lamoreaux and Sokoloff⁴⁸ who seem to indicate that in the United States the market for technology was largely mediated by individual business agents and large and specialized patent agencies diminished in importance over time. In Sweden however, a few (5-6) large patent agencies handled between 60-70 percent of all patents (see figure 3) on the market during the period, several of them are still active both domestically and internationally. An oligopolistic market situation would certainly make the probability of such a situation more likely.

⁴⁵ Swanson, K. W. (2009). The emergence of the professional patent practitioner. *Technology and Culture*, 50, 519–548, pp. 522

⁴⁶ *Ibid.*, pp. 522

⁴⁷ Khan, B. Z. (1995). Property Rights and Patent Litigation in Early Nineteenth-Century America. *Journal of Economic History*, 55(1), 58–97.

⁴⁸ Lamoreaux & Sokoloff, “Intermediaries in The U.S. Market For Technology , 1870-1920” in Engerman, S. L., & Davis, L. E. (2003). *Finance, Intermediaries, and Economic Development*. Cambridge University Press

As pointed out recently by Zorina Khan⁴⁹ firms and individual inventors adapted their patenting strategies to their environment and country specific characteristics. *“Patentees’ ability to follow these strategies depended on the nature of legal and market institutions, highlighting the need for policymakers to design specific mechanisms that would attain the desired social objectives.”*⁵⁰ Here the patent agents certainly played an important role both for legal and market institutions, but the role probably differed across countries. For example, in Sweden almost all patent agents were experienced engineers, while in Japan the *“[t]he majority of attorneys that were practicing during the 1890s had no technical knowledge or legal expertise”*⁵¹.

A concluding remark could also be made regarding Khan’s conclusion that *“[m]any of the important features of modern society, at least in terms of the organization of technology markets, emerged during the course of the nineteenth century and crystallized during the Second Industrial Revolution”*⁵². Considering the Swedish Patent Office’s current view of and relationship with patent agencies (see note⁵³) it gives perhaps an indication that the larger markets for patenting and the actors that emerged after the 1884 patent law created a very strong and stable institutional setting with the patent agencies as central actors that “crystallized” in the new intellectual property system. This would further underline the importance to include these actors in discussions about patenting and patenting strategies in research today.

⁴⁹ Khan, B. Z. (2013). Selling Ideas: An International Perspective on Patenting and Markets for Technological Innovations, 1790–1930. *Business History Review*, 87(01), 39–68. doi:10.1017/S0007680513000135

⁵⁰ *ibid.* pp. 67

⁵¹ Nicholas, T., & Shimizu, H. (2013). Intermediary Functions and the Market for Innovation in Meiji and Taishō Japan. *Business History Review*, 87(01), 121–149.

⁵² Khan, B. Z. (2013). Selling Ideas: An International Perspective on Patenting and Markets for Technological Innovations, 1790–1930. *Business History Review*, 87(01), 39–68. doi:10.1017/S0007680513000135., pp. 66.

⁵³ *“Sweden does not have such requirements, but PRV’s statistics show that an application filed by a professional patent agent is far more likely to lead to a patent than one filed by the applicant themselves.../.../...”*

In order for you to be able to benefit – and hopefully make money – from your patent, it is important that the patent agent you choose also understands the business context and the use you have of a patent.../.../...

If you are also planning to apply for patents in other countries, it is important that the agent or patent agency you choose has an international network of contacts. You can then easily get help to find knowledgeable local agents, who are needed to deal with patent applications in other countries.../.../...

In Sweden, many professional agents are part of the organization Svenska patentombudsforeningen (SPOF). The members of SPOF are bound by the organization’s ethical rules, including professional secrecy, meaning they are obliged not to disclose what they find out during confidential contact with clients.” (See: www.prv.se, “Guidance on choosing an agent”)

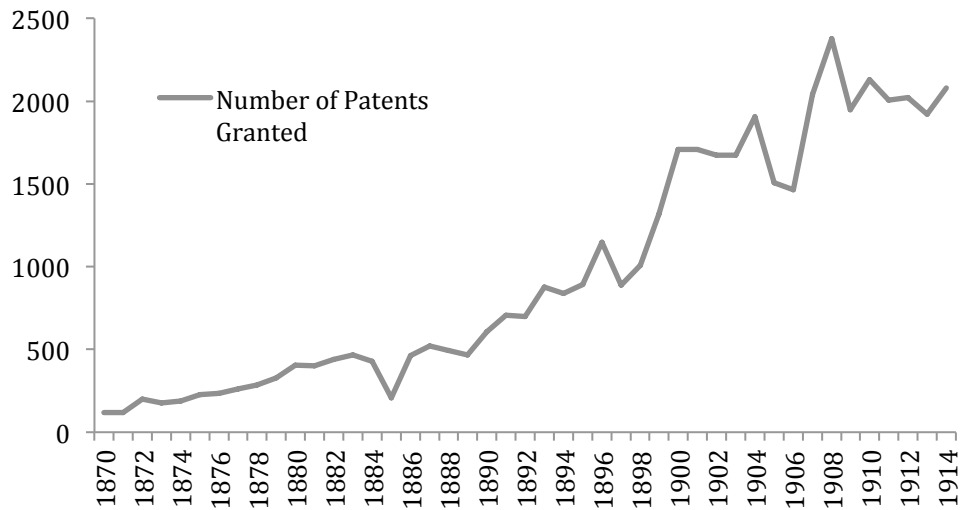


Figure 1
Number of patents granted, 1870-1914

Source: PRV register & Tisell (1907)

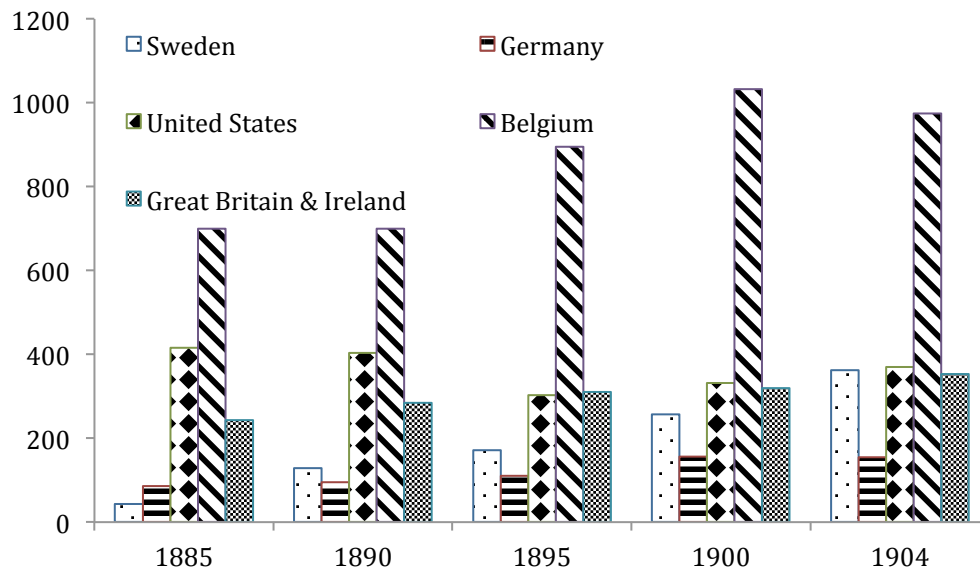


Figure 2
Number of patents per million inhabitant, 1885-1904

Source: Tisell (1907)

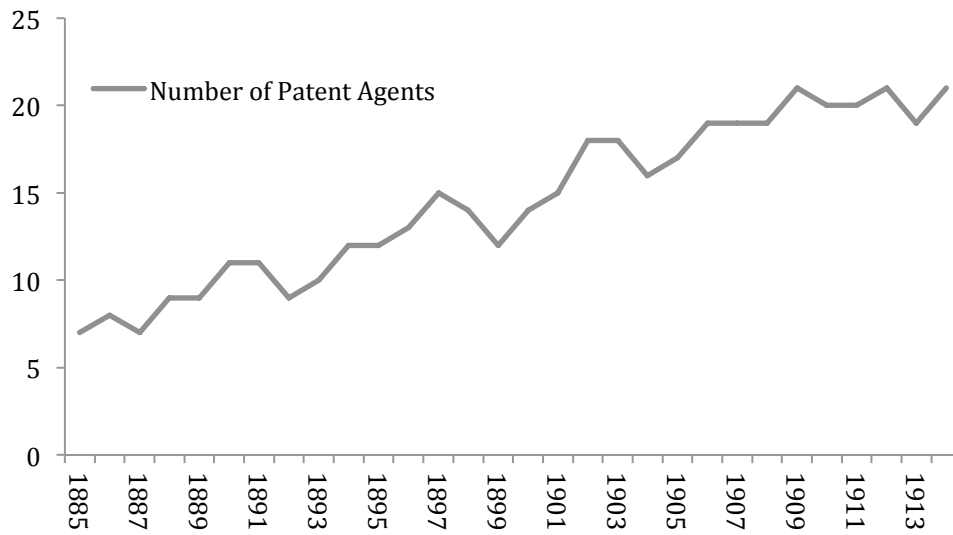


Figure 3
Number of Patent Agents, 1885-1914

Source: PRV register

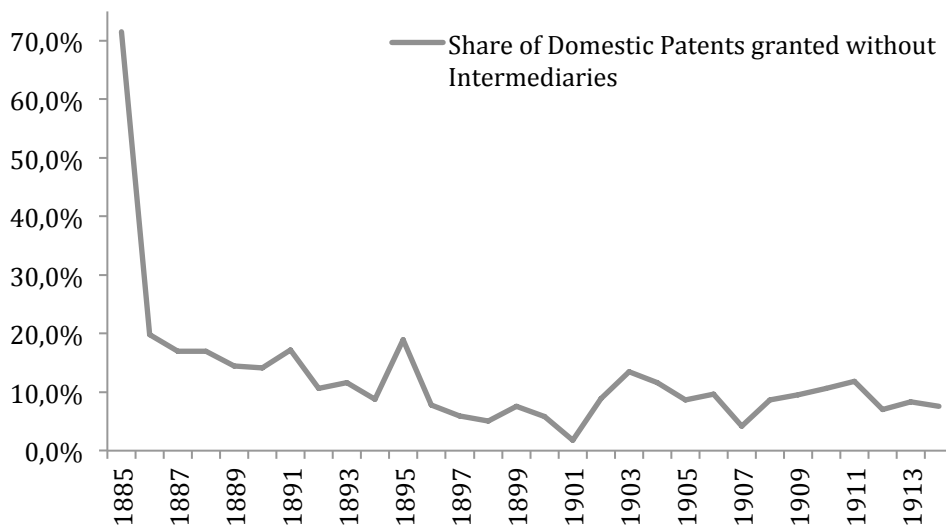


Figure 4
Share of Domestic Patents granted without Intermediaries, 1885-1914

Source: PRV register

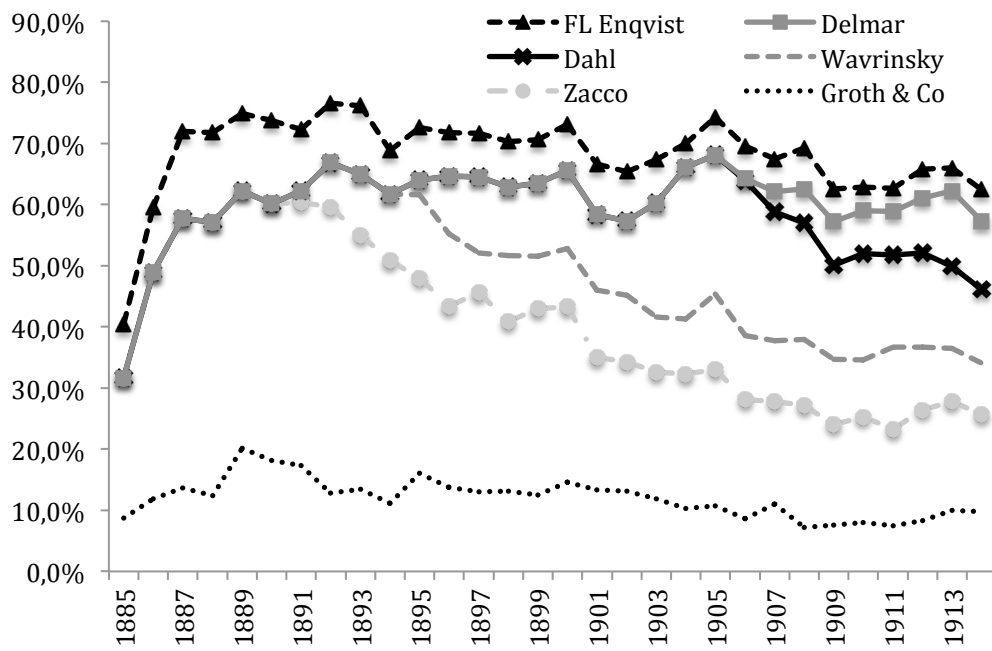


Figure 5

Accumulative Share of total Patents Granted for the six largest patent agencies, 1885-1914

Source: PRV register

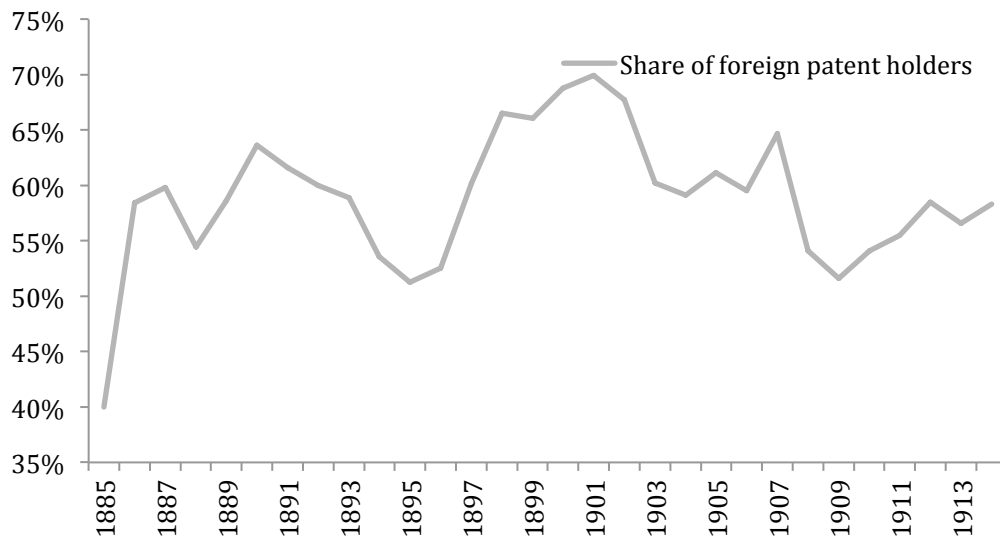


Figure 6

Share of foreign patenting in Sweden, 1885-1914

Source: PRV register

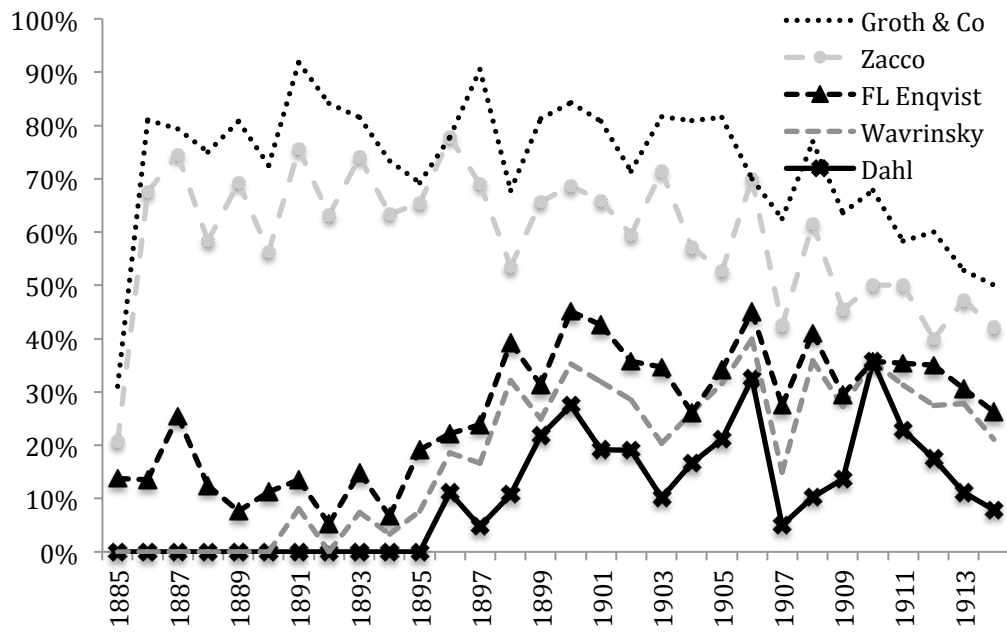


Figure 7
Accumulative share of patent transfers for the five largest patent agencies, 1885-1914

Source: PRV register

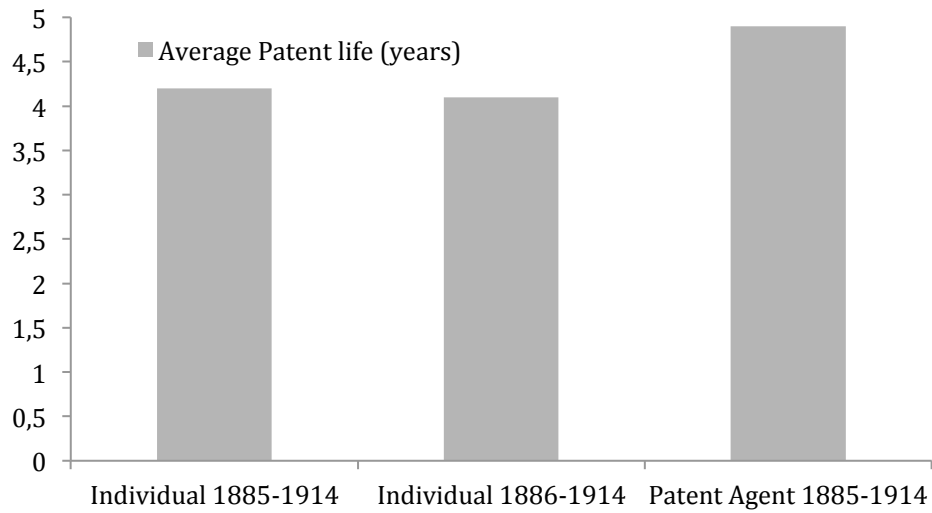


Figure 8
Average Patent Life of Domestic Swedish Patents with or without a Patent Agent, 1885-1914

Source: PRV register