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INNOVATION QUALITY IN KNOWLEDGE CITIES: EMPIRICAL EVIDENCE OF INNOVATION AWARD COMPETITIONS IN FINLAND

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Abstract: Innovation awards have for long attracted policy makers as a method for innovation promotion. Still, academic research on innovation awards has thus far received little attention. In particular, empirical studies on the motives to enter award competitions and the realized impacts of winning an innovation award are scarce. This study addresses this research gap. Firm-level evidence, questionnaire data on innovation award winning companies of the Finnish national Innofinland and Quality Innovation of the Year award competitions, indicate that the motives for companies to participate in award competitions and the realized impacts of winning an award are largely the same: media coverage and a credibility boost. The importance of innovation awards in innovation policy was, however, considered only as mediocre or modest. As a conclusion it can be stated that innovation awards are an additional tool for innovation promotion, alongside innovation inducement policies including tax reductions and direct funding, as they produce significant positive effects for the award winning companies, and an additional indicator of innovation quality in the context of knowledge cities.

Keywords: Finland; Innovation awards; Innovation policy; Innovation prizes; Knowledge city

Highlights

- The motives to enter award competitions are largely non-monetary.
- The most important impacts are media coverage and credibility boost.
- The importance of awards in promoting innovation was considered as mediocre.
- Innovation awards are a supporting tool in innovation policy.

1. Introduction

In various spatially oriented streams of economic thought and investigation, including local clusters (Porter, 2000), regional innovation systems (Cooke, 2004) and knowledge cities (Yigitcanlar, Velibeyoglu & Martinez-Fernandez, 2008), methods for boosting the innovativeness of cities and regions have gained significant academic interest. Innovation awards have been positioned as an example of such methods: innovation awards or prizes have for long been discussed as important incentives for private firms to invest in R&D and other innovation activities (Kay, 2012b; Urpelainen, 2012; Williams, 2012). Still, academic research on the subject has been relatively scarce (Adamczyk, Bullinger & Möslin, 2012; Kay, 2011a; 2012a). This study aims to address this research gap by discussing the benefits of innovation awards for firms and the motives for their entry into an innovation competition with unique questionnaire data gathered from Finnish innovation award winning companies:

the data focuses on two Finnish (ex-post) innovation award competitions, namely Innofinland and Quality Innovation of the Year (QIY) awards. The aim of this study is first to explore the motives to enter such award competition and second to investigate if innovation awards bring significant benefits to award winning companies.

Innovation awards have already received professional attention from the city planners in regard to the concept of knowledge cities. In Guangzhou, China, the city officials are implementing methods, including the Guangzhou Technology Innovation Award, for innovation-oriented city construction. The award is also designated to aid the optimization of the local business environment for innovative talent (Guangzhou Municipality, 2013). Accordingly, the city of Rotterdam, the Netherlands, has plans for linking innovation awards in their policy to characterize themselves as a knowledge city (City of Rotterdam Regional Steering Committee, 2009). Thus, there is a potential but still underutilized connection between innovation awards and the (urban) knowledge-based development. This leads us to review innovation awards in relation to the concept of knowledge cities and to conclude with a policy discussion concerning the use of innovation awards as a government policy instrument as well as a tool for developing knowledge cities. The study, thus, replies to the call voiced by Kay (2011b) to use questionnaire data in order to gain a better understanding of the activities of innovation competition participants. Our specific research goals are:

- (1) To provide a literature-based view on the significance of innovation awards and their implications for the knowledge cities.
- (2) To answer the following empirical research questions:
 - a) What were the initial motives to enter the competition?
 - b) What were the perceived benefits after the award was granted?
 - c) What implications for innovation policies do the results entail?

In relation to the terminology used, innovation prizes and innovation awards can be seen as close relatives. Still, one can make a distinction between these two. Although, awards are also referred to as grants, as is in the case of small business innovation research programs (Wessner, 2009a; Salles-Filho, Bonacelli, Carneiro, Castro & Santos, 2011), they do not necessarily include a monetary reward, whereas prizes are most often monetary in nature. Thus, the motivation for entering the award competition had to be derived from sources other than instant monetary gain. This notion lays the foundation for the motivation behind our research questions.

2. Foundations: innovation policy as context for awards

Governments and international organizations are currently following the techno-scientific development paradigm in order to boost their economic and knowledge-based development. Therefore, the modes of innovation policy and innovation inducement (or incentives) have received a great deal of attention from policy makers and academics alike. In particular, research on government-led innovation inducement has been prolific in environmental economics, that is, when discussing eco-innovations (Veugelers, 2012). The link between innovation and economic growth has for long been almost unquestionably at the center of debate on development economics as well as business and management studies (de Bruijn & Lagendijk, 2005). Thus, promotional tools for enhancing the innovativeness of firms, regions and nations are perceived to be of utmost importance in the development of innovation policies of, for example, the European Union and individual governments (European Commission, 2010). The promotional aspect is highly important for cities in which the award

winners locate. Award competitions are therefore additionally tools for firm-based cluster marketing for cities aiming to promote their knowledge image.

Innovation policies aimed at inducing innovation can be labeled as: (i) technology-push (ex-ante) and; (ii) demand-pull (ex-post) policies. Technology-push policies are measures targeted at reducing costs to firms' for producing innovations. These public policies include for example direct government funding for R&D, tax credits or reductions for companies to invest in R&D, support for training and funding demonstration projects. Demand-pull policies are those actions that are targeted at raising the payoff for successful innovations. These include policies such as intellectual property protection, tax credits and rebates for consumers of new technologies, government procurement, technology mandates, regulatory standards and taxes on competing technologies (Nemet, 2009). According to this dichotomy, innovation awards can be considered as a demand-pull policy option, as they are, as their name suggests, awarded to already existing inventions rather than R&D activities (Jeffrey, Jay & Winskel, 2013). Innovation awards are, thus, designed to increase the payoff of successful innovations.

Current innovation literature has recognized the importance of awards and prizes as an external impetus for motivating firms to gain prestige for their innovations. In a recent account, Adamczyk *et al.* (2012) summarized an extensive literature review of innovation contests. They provided a detailed classification on the terminology of innovation contests including several related terms. However, 'award' was missing from their account and this contributed to our decision to concentrate on innovation awards. Award winning companies provide an interesting study platform as they may be approached as a particular category of company (i.e. considered successful because they have been given an award). Thus, there are relations to 'best practices' or 'best performers' and innovative examples of successful business. Caird (1994) produced one of the early studies focusing on awarded SMEs from the United Kingdom's Government sponsored Small Firms Merit Award for Research and Technology (SMART). The study however focused on innovation processes, that is, on finding where ideas for a new product, service or process come from, not on the significance of the awards themselves. Accordingly, Larsen and Lewis (2007) studied relevant questions from the problem solving point of view, namely on how award winning SMEs manage their innovation barriers. Their data involved eight innovative firms from different fields and the study results indicate that understanding SME behavior and innovation creation involves a mixture of coping with commonly recognized elements on funding problems (consistency of finance), research management, human resources (staff turnover and production skills), logistics and marketing.

Accordingly, economists (Nalebuff & Stiglitz, 1983; Wright, 1983; Rogerson, 1989) have long claimed that under certain conditions innovation prizes can induce innovation, that is, provide private entrepreneurs with strong incentives to invest in R&D. In particular, the interest has been in innovation prizes as an alternative to patent systems in invention appropriation (de Laat, 1996; Scotchmer, 2004; Masters, 2005; Hopenhayn, Llobet & Mitchell, 2006; Chari, Golosov & Tsyvinski, 2012; Clancy & Moschini, 2013). What literature there is on innovation awards has, however, been mainly confined to studies concerning the innovativeness of (public) management (Altshuler & Behn, 1997; Bernier & Hafsi, 2007; Borins, 2008) instead of the realm of technological innovation, where the majority of innovation studies are found (Kalil, 2006). Additionally, innovation awards and prizes have been used in choosing case studies and in delineating samples (Simmie, 2004; Gemünden, Salomo & Hölze, 2007) and as a measure of the support received and the successfulness of innovative activities at firm-level (Romijn & Albaladejo, 2002; Laforet, 2009). The assessment processes aimed at evaluating and prioritizing inventions according to

their innovation potentials have been broadly defined in the expert systems literature as ‘innovation intelligence’ (Dereli & Altun, 2013). Still, as Kay (2011b: p. 360) has noted, ‘academic research, however, has barely investigated these prizes in spite of their long history, recent popularity, and notable potential’. Similarly, Wei (2007) reports a lack of empirical research on the effectiveness of prize systems.

Moreover, the scant empirical evidence on innovation awards and prizes is inconsistent. Already in the nineteenth century the French Academy of Sciences saw limitations in rewarding a few successful examples of research (Crosland & Gálvez, 1989). Accordingly, Wei (2007) has stated that innovation prizes are not trouble-free incentives as the grounds for their presentation are more or less subjective, which raises the question of how to determine which innovations deserve a prize (see also Heinze, Shapira, Senker & Kuhlmann (2007) for scientific prizes and Yang & Hsieh (2009) for quality awards). Moreover, in giving a prize to a selected few there is a risk of discouraging other high-quality innovators. Thus, criticism has been voiced regarding the feasibility of prize systems (Wei, 2007) and questions raised as to whether a prize can sustain the commercial development of a prize-winning innovation (Davis & Davis, 2004; Larsen & Lewis, 2007). Expert systems are recognized here as useful tools in the evaluation processes of award competitions (Chen & Chen, 2009).

The proposed motives to enter innovation competitions can be generalized into two types of factors: (i) monetary and; (ii) non-monetary rewards. Firstly, monetary rewards are obviously one reason for entering innovation prize competitions. However, a small cash reward might not even cover the costs of the R&D involved and, thus, be an inadequate incentive to invest in R&D. Therefore, monetary rewards do not completely explain the willingness of firms to enter such competitions (Kay, 2011b). Secondly, there are the benefits of increased publicity, credibility and reputation. This view stresses, that competitors might grasp the ‘advertising’ impact of winning an award as more important than the purely cash dimension of any such award (Brunt, Lerner & Nicholas, 2008; Stine, 2009). Therefore, non-monetary rewards are at least equally important in explaining why companies and organizations participate in award competitions (Murray, Stern, Campbell & MacCormack, 2012).

As discussed by Caird (1994), the difficulty for award winning innovators is not in getting ideas, but in estimating which of these ideas have market potential (again, expert systems should be considered as tools in the evaluation process). However, not everyone is as grim, as earlier results of the studies by Borins (1998; 2000; 2001) contradict these skeptical views on innovation award winners’ survival and replication with empirical data. This shows that creativity, innovation and firm-level competitive advantage are interlinked (Bassett-Jones, 2005): statistical tests have provided strong evidence that the performance of award winning firms is significantly higher compared with other firms (Zhang, Yu & Xia, 2012; Nicolau & Santa-María, 2013). Similarly, Azadegan and Pai (2008) associate product innovation awards to direct sales growth and performance. However, the effects of awards on innovation and creativity are anything but straightforward (Eisenberg, 1999).

3. Implications: awards as an indicator of innovation quality in knowledge cities

The knowledge city concept has definite connections with innovations awards. Knowledge cities, as proposed by Yigitcanlar, O’Connor and Westerman (2008), can be considered in the context of encouraging and nurturing locally focused innovation as a way to strive towards a more viable, vibrant and sustainable form of urban development. Accordingly, the outcomes of knowledge-based (urban) development processes can be observed through the economic

growth in a city, which is a direct or indirect result of technologically (or educationally) induced advances in productivity (Carrillo, 2009). Thus, one way of measuring and benchmarking the knowledge-based development capabilities and innovativeness of (knowledge) cities is through the quality and numbers of innovation.

Innovation awards offer an extremely interesting and useful additional indicator for measuring the innovativeness of (knowledge) cities, because they, as such, also contain a certain degree of reliable information concerning the quality of the innovations produced in a region or city: a city producing salient numbers of award-winning innovations (expectedly) possesses favorable conditions for these quality innovations to emerge. Accordingly, innovation awards could be directly utilized as a measure for innovation recognition and support in international or national benchmarking frameworks such as the “Knowledge-Based Urban Development Assessment Model (KBUD/AM)” (Yigitcanlar & Lönnqvist, 2013).

These notions bring forth interesting insights into the quality of innovations produced in Finnish cities, since a large proportion of the award-winning innovations have actually been introduced outside the most obvious place to be designated as a knowledge city in the Finnish context, namely the capital region of Helsinki. Thus, it seems that knowledge cities can definitely arise outside the largest city centers in smaller and more peripheral locations. Investigation on the enablers and facilitators of the high-quality innovations outside the settings of the largest cities (i.e., second-tier cities) and even peripheral locations should produce interesting insights regarding the dynamics of innovation creation and urban knowledge-based development. Studies focusing more directly into the use of innovation awards as an indicator of innovativeness also in the regional or city perspective (in addition to the firm-level analysis conducted here) are needed to verify these propositions.

4. Empirical backgrounds

4.1. Innovation award competitions

We focus on two prominent Finnish innovation award competitions, namely Innofinland and Quality Innovation of the Year (QIY) awards. The national Innofinland (2013) awards (established in 1994, cancelled in 2011) were presented each year to acknowledge and encourage innovative entrepreneurship. The award was aimed at promoting the development of novel inventions into commercial products or services and was designed to induce innovation and spur new business activities, but included a monetary prize only in some specific years prior to 2001. It provided opportunities for entrepreneurs, inventors, public administration officials, financiers, counseling organizations and associations in the field to network and collaborate. Innofinland emphasized the importance of innovative small and medium-sized companies (and draws special attention to Finnish regional and urban characteristics in terms of knowledge-based development), but the award could have equally well be presented to organizations or private persons whose ideas, inventions or innovations had significantly promoted creativity, entrepreneurship, co-operation and employment in Finland.

The Innofinland award competition included a regional qualification round. In order to enter (in one region only), firms needed to submit the entry form and the accompanying documentation to the Innofinland bureau. Moreover, each year there was a specific, but loose, theme that the innovations had to address to be eligible for the award. The entries were treated as confidential, but it was the responsibility of the participant to consider whether to apply for protection by industrial property rights prior entering the competition. One to three

entries from the regions continue to the nationwide contest. The Innofinland Jury nominated the candidates for award winners (commonly five awards were given annually). The Jury comprised representatives from several Finnish administrative and science and technology funding bodies, which have a pivotal role in the Finnish national innovation system (Ramstadt, 2009), including the Ministry of Employment and the Economy, the Foundation for Finnish Inventions, the Central Chamber of Commerce of Finland, the National Board of Patents and Registration of Finland, the Finnish Innovation Fund (Sitra) and the Finnish Funding Agency for Technology and Innovation (Tekes). The President of Finland acted as patron of the project. Thus, Innofinland awards can be seen as an attempt by the Finnish government (and by the whole innovation system) to gain higher returns on its significant investments in R&D (Wessner, 2009b). The grounds for the awards included:

- The idea, invention or innovation had substantially promoted business activities.
- The activities had furthered the introduction of inventions on the market.
- The innovativeness of the product or service and the advantage to the customer.
- The continuity of activities; R&D and level of technology; promotion of employment and the competitive situation in the field.

The second innovation award competition under study here, the QIY award of the Laatu keskus Excellence Finland (2013) has been given annually since 2007. Its purpose is to increase the amount and quality of innovations in Finland. At the same time the QIY award competition acts as an audit of the feasibility of the innovation: every firm receives a written assessment aimed at aiding in further development. There is, however, no monetary prize. The award has distinct competition categories for public administration as well as for small, medium and large enterprises. The award is granted on the basis of the products' or services' innovativeness and quality:

- Novelty value
- Usability
- Utilization of new knowledge
- Customer orientation
- Effectiveness.

The nominees, based on the audit by the Laatu keskus Excellence Finland and expert assessments, for the award are judged by a selected jury. As in the case of Innofinland, the President of Finland has personally presented the awards for the eventual winners at the Gala Event (recent winners include for example Rovio Entertainment for the development of the *Angry Birds* mobile game and STX Finland for the planning and construction of the world's largest cruise ship, at the time, *Oasis of the Seas*). Firms entering the competition have to pay a small participation fee and fill in the necessary application form.

4.2. Survey data

The questionnaire was formulated following the basic principles of the Community Innovation Survey of the European Union with specific questions concerning the innovation awards. Additionally, the questionnaire was constructed by utilizing earlier empirical and conceptual studies complimented with basic background information concerning the firm (size of the company in terms of annual turnover and employees, home region, field of operations) and the award winning innovation (novelty, type and a short description of the award winning innovation plus the year that it was awarded). The feasibility or value of the innovation was estimated by using its availability or existence in the market as a sign of 'success'.

The motives to enter and the realized impacts of the innovation awards were listed following earlier literature on innovation award competitions (Azadegan & Pai, 2008; Brunt *et al.*, 2008; Stine, 2009; Kay, 2011b; Murray *et al.*, 2012) such as: (i) monetary prize; (ii) sales boost; (iii) media coverage, and; (iv) credibility and reputation boost. The questionnaire also featured open-ended questions for indicating any additional motives for why the companies had entered the innovation award competition and any impacts that winning the award might have produced. Moreover, we asked the respondents to give their opinion on the importance of innovation awards (compared to, for example, tax reductions and direct funding) in innovation policy.

The data was collected via a targeted firm-level online survey. E-mail addresses provided by the innovation awards' webpages were used as the initial contact persons when available; otherwise the CEOs, managing directors or directors of R&D were contacted. Of the 134 companies that have won the awards, the 97 firms that we were able to identify with up-to-date contact details were asked to participate in the survey. When researching the contact details we encountered suggestive data on the reasons behind the loss from 134 to 97 companies: (i) of the initial award winners some have evidently disappeared from the 'map of Finnish firms' due to mergers and buyouts (which can also be seen as a sign of success), but however, (ii) some of the award winning companies had gone through bankruptcy or closure. The data collection (from December 2012 to February 2013) included three rounds (two reminders). We received 30 responses, of which 87% were SMEs and 13% were large enterprises. Our data thus covers a fair response rate of 30.9% (Tables 1 & 2).

[INSERT TABLE 1]

In terms of representativeness of the data, Table 1 shows that the data is more extensive on coverage for the QIY award (response rate 33.3%). Considering the representativeness of the data it is recognized that each award is unique and the competitions cover all fields of industries. Therefore, the possibilities for generalizations are limited in the first place. This reflects to the fact that company specific independent variables yielded non-significant results for co-variance of dependent variables (award significance and their impacts on experienced benefits): Table 2 provides an overview of this diversity in terms of company size categories and fields of operations.

[INSERT TABLE 2]

Tables 1 and 2 indicate that the awarded companies are from a diverse field of industries. Interesting finding is that ICT and biotechnology sectors have gained relatively few awards, considering the weight that has been placed to the promotion of these industries in the Finnish national innovation system. The survey data is comparable to the official listing of award winners (Innfinland, 2013) verifying this absence. An important notion from Table 2 is that award winners represent a variety of cities. Particularly Innfinland awardees are from small and peripheral cities compared to QIY recipients that are all, except for one, from the capital region of Helsinki (Helsinki and Espoo).

5. Results

Tables 3 and 4 give us an overview on the award winning innovations. The awarded innovations are to large extent (60.0%) product innovations. The awarded innovations are new globally and, thus, they are targeted at international markets. A minority of the awarded 'innovations' were up-dates or enhancements to already existing products, services or processes. The development had been halted before entering the markets in only one out of the award winning inventions, the rest are available, in production or under further

development. This signals success in terms of the demand for award winning innovations. Thus, award-winning innovations can be considered as feasible in terms of their commercial value and high quality. However, a bias towards respondents with successful innovations compared to those that have not succeeded and the fact that most respondents had received the award quite recently are more than likely to play a part in the reported (high) success rate. Still, another main interpretation is that innovations awarded in the studied innovation award competitions are durable in time and have at least some market demand.

[INSERT TABLE 3]

Table 3 indicates interesting tendencies in the profiles of awarded projects. During the latter part of the Innofinland award years (2005 onwards) the awarded innovations have slightly moved from process innovations towards service innovations. Even considering the coverage of our data (30.9% of all awards) the tendency seems evident. Similarly QIY award responses do not include any process innovations. The awards are strongly focused on actual products and to traditional production industries such as forestry, metallic industries and construction (cf. Table 2).

[INSERT TABLE 4]

Innovation awarded inventions are clearly considered to have a potential for impacting global markets. The results also verify that the awarded innovations have clear market demand still after several years of receiving the award (90% of innovations are still available/in production). Thus, innovation award competitions have been successful in identifying resilient products, services and practices.

Table 5 provides a descriptive answer to our first main question: What were the initial motives to enter the competition? There are two main interpretations concerning the differences of medians and modes for each category in Table 5. First, the aim of increasing sales was initially the main drivers for companies to enter the award contest (mode of the results). In terms of averages credibility and reputation was considered slightly more important than media coverage and sales boost. The respondents in entering the awards contests did not consider monetary gain in the form of prize money an important motive. This is of course more due to the fact that a monetary prize was given out for only Innofinland winners and only in the early years of the award, namely, before 2001. Additionally, in a few cases the respondents reported that they had been asked to participate in the award competition by their stakeholders or other third-party actors.

Table 6 provides answers to the second empirical question (2b) of the paper. The media coverage of the innovation awards may be considered good in the national and local media. Still, the media visibility is mainly national: only two respondents indicated that their innovation award led to international visibility. The award also had some minor impact on the sales of the award winning companies, but many respondents reported no significant boost in their sales. The credibility and reputation impact of the award was considered to have had the clearest impact on the respondents' performance in that it further helped to secure finance. The innovation award was (and still is) also often used in the award winners' marketing strategies as a sign of high levels of competence. Moreover, some firms reported that winning the award had positive impacts on the 'factory floor level' in that it increased the interest (and pride) of the personnel for product development. From the few companies that did receive a cash prize none considered it to have had even some impact on their company's performance.

[INSERT TABLE 5]

[INSERT TABLE 6]

In short, the motives to enter the award competition and the realized impacts of winning the innovation award go largely hand-in-hand. In terms of averages, credibility was perceived as the most important and the monetary prize as the least important reason for entering the award competition. Similarly, the credibility boost from winning the award had the clearest and the impact of the cash prize the lowest significance for the performance of the award winning companies. Still, 30% of respondents reported a growth in sales due to the award. Thus, the highlighted benefits of winning the award consist of the direct financial impacts and the indirect benefits resulting in financial gains after a certain time lag. Only one respondent reported that the innovation award had had some negative impacts (in creating unhealthy competition between suppliers). It, thus, seems that firms gaining from one aspect of the realized impacts were, to some extent, likely to gain from another: there are evident differences in the abilities of award winning companies to take full advantage of the awards in terms of credibility, media coverage and sales.

The relatively small sample size, even with a reasonable response rate, remains a limitation of this study. A cross-country comparison or a combination of data from different international innovation awards might overcome some of the problems related to the small total population of award winning companies in Finland. Similarly, some caution is needed with the novelty aspect of innovation, when the data is constructed with questionnaires; firms have been reported to overestimate the newness and uniqueness of their innovations (Danneels & Kleinschmidt, 2001). However, due to their expertise they are, at the same time, in the best position to assess the novelty of their products, processes and services, even if some subjective bias towards exaggeration might exist. Therefore, keeping in mind the fair response rate, it is reasonable to state that the data and results presented here are representative of the two innovation award competitions under examination.

6. Discussion and conclusion

The answer to the first empirical research question (2a) is that the initial motives to enter innovation award competitions are non-monetary—benefits and reasons to enter are to be found from marketing gains and, accordingly, the answer to the second empirical research question (2b) is that the obtaining of an innovation award contributes to the image aspect of innovation creation: the recipients of these awards appreciated credibility and reputation. Success in innovation award competitions is a clear signal of the high quality of an innovation and the gains from a credibility boost and extra media coverage for an individual company are significant. For the participants, award contests and competitions are, thus, parts of marketing strategies aiming to enhance product (and company) reputation. The financial attributes (growth in sales, direct income) are secondary to image creation as a tool for marketing. However, it seems that companies gaining in one aspect of the award were, to some extent, likely to gain from another, signaling that there are differences between the abilities of companies to exploit the momentum attained from winning the award.

In terms of their feasibility as part of innovation policy (the empirical research question 2c), innovation awards may be considered as a good supporting tool. They are not that important in that they would significantly encourage firms to invest in innovative activities, if considered independently from other innovation promotion methods, but can be considered as an important implement against which to benchmark different innovations (expert systems provide valuable tools for this). The importance of innovation awards as a medium for innovation policy—compared to for example, tax reductions and direct funding—was considered only as modest (average score 4.6 out of maximum of 7). The mediocre score on the importance of innovation awards as a tool for innovation policy signals a greater need for

monetary technology-push (ex-ante) policies such as direct funding for firms compared to the demand-pull (ex-post) non-monetary rewards gained from the award. These policies are related to the governments' tool selection involved in the practical execution: innovation awards are one example of this policy arsenal, but other methods for promoting innovation are also called for.

The examples from Guangzhou and Rotterdam imply that there is a potential for using innovation awards in the creation and development of knowledge cities. As shown here, companies are keen on participating in innovation award contests and consider even the non-monetary rewards of winning an award as beneficial to their company reputation and day-to-day operations. Thus, city specific innovation award competitions might work reasonably well in heightening the innovative output of a given city. However, as in the case of innovation awards as a policy tool, city officials should consider the combination of both technology-push, for example by establishing funds for developing promising ideas and supporting auspicious start-ups, as well as demand-pull methods in retaining and attracting innovative talent and companies. The mere ex-post acknowledgement of innovative companies is not enough to encourage them to invest on R&D and other innovative inputs.

Innovation awards, as proposed here, can serve as a valuable indicator of innovation quality also in the context of knowledge cities. More comparable quantitative and qualitative research is needed to confirm the empirical notions reported here in other spatial competition contexts. Additionally, the question of place promotion and external economic benefits for cities and regions caused by the award competitions require further attention. For example, the spatial distribution analyses of externalities of the economic impacts of award winning companies provide a potent research agenda for the future studies.

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Table 1

Innofinland and Quality Innovation of the Year award winning companies in Finland: total population, the sample and number of questionnaire respondents.

	Innofinland (1994–2011)	Quality Innovation of the Year (since 2007)	Total
Total population	113	21	134
Our sample	76	21	97
Respondents	23	7	30

Table 2

Innofinland and Quality Innovation of the Year award winning respondents in the data.

Award	Home office location	Main field of operations	Annual turnover in Euros (2011)	Number of personnel
Innofinland	Pirkkala	Design and manufacturing of machinery	1 200 000	14
	Kuopio	Welfare technologies	300 000	3
	Varkaus	Components and devices for paper industry	35 000 000	120
	Vaajakoski	Measurement devices	8 000 000	80
	Helsinki	Production and development of tools	3 000 000	4
	Joutseno	Steel industry	17 100 000	30
	Tampere	Research and development	1 000 000	12
	Turku	Retailing	700 000	3
	Pori	Internet services	4 000 000	30
	Pori	Production and devices for handicap people	360 000	4
	Nummela	Recycling textiles	1 400 000	15
	Rauma	Environmental technology	4 500 000	20
	Kauniainen	Music education on the internet	250 000	5
	Rovaniemi	Security technologies	600 000	3
	Oulunsalo	Steel industry	1 900 000	20
	Kotka	Chemistry	2 000 0000	8
	Salo	Steel industry	4 500 000	30
	Jyväskylä	Welfare technologies	2 000 000	25
	Lappeenranta	Product development	350 000	10
	Savonlinna	Machinery for agriculture	4 000 000	20
	Vihti	Building materials	500 000	–
	Joensuu	Computer programs	100 000	2
	Ulvila	Information technology	150 000	5
QIY	Helsinki	Machinery for agriculture	–	3
	Helsinki	Construction	200 000	4
	Helsinki	Targeted methods of payment	74 000 000	37
	Helsinki	IT and software	100 000 000	1000
	Lahti	Electronics	120 000 000	670
	Espoo	Planning	32 000 000	465
	Espoo	Forestry	1 300 000 000	850

Table 3

Characteristics of the awarded innovations.

Award		Product innovation	Service innovation	Process innovation	Other innovation
Year	Description				
	Innofinland:				
1996	New latch design and technology	x			
1999	Testing tool for commercialization	x			
2001	Pipe saw	x			
2001	Modulation for metallic furniture			x	
2003	A compact part for paper machine's wet component			x	
2003	Mixing technology for processing industry	x			
2004	Tool for measuring stress	x			
2004	Automated production method			x	
2005	Facade system	x			
2005	Standing support for disabled	x			
2005	Design products based on recycling			x	
2005	Concentrate of sunscreen for cosmetics industry	x			
2005	N/A	x			
2006	Construction online portal		x		
2007	Safety product innovation	x			
2008	Water purification system working on surface flows	x			
2010	Outfit for surgery patients	x			
2011	Test bed for guidance system	x			
2011	Tool for customer satisfaction measurement		x		
2011	5-axes CNC-machinery	x			
2011	Production development simulator	x			
2011	Life cycle management for individuals		x		
2011	Online teaching of music		x		
	Quality Innovation of the Year (QIY):				
2007	Sports voucher				x
2010	Online ordering solution for welding	x			
2010	Plumbing service concept		x		
2011	Online support system for moving work		x		
2011	Forestry robot for timbering automation	x			
2012	N/A	x			
2012	Real-time quality index for pulp production				x

Table 4

Characteristics of the awarded innovations.

The type of the winning innovation	Responses (%)
Product innovation	18 (60.0%)
Service innovation	6 (20.0%)
Process innovation	4 (13.4%)
Other	2 (6.6%)
Novelty of the winning innovation	
New for global markets	22 (73.3%)
New for domestic markets	2 (6.7%)
Improvement on existing product, service or process	5 (16.7%)
I do not know	1 (3.3%)
Is the winning product, service or process still available/in production	
Yes, the product is in production/available	27 (90.0%)
No, but it is under further development	2 (6.7%)
No, the development process has been halted	1 (3.3%)

Table 5

Motives for firms to enter innovation award contest.

Why had the firm entered the innovation contest?			
(1 = no importance; 7 = highly important)			
	Average	Median	Mode
Aim to obtain monetary prize (granted before 2001)	1.9	1	1
Aim to increase sales	4.9	5	7
Aim to increase visibility in media	5.6	6	6
Aim to increase credibility and reputation of the firm (e.g. in the search for funding)	6.0	6	6

Table 6

The impacts on firms after the award.

	N (%)		N (%)
The impact of the monetary prize for the firm		The impact for sales	
No significance for the firm	3 (10.0%)	The sales grew significantly	1 (3.3%)
Monetary prize not received	27 (90.0%)	The sales grew marginally	8 (26.7%)
		The sales remained the same	13 (43.3%)
		I am not able to identify the impact	8 (26.7%)
The impact on media coverage		The impact on company reputation and credibility	
We gained media time in local media (city/municipal)	6 (20.0%)	The award had a significant impact	7 (23.3%)
We gained media time in national media	18 (60.0%)	The award had a minor but distinct impact	20 (66.7%)
We gained media time in international media	2 (6.7%)	No, the prize had no impact	2 (6.7%)
We did not gain media visibility after the award	4 (13.3%)	I do not know	1 (3.3%)