

Discussion Paper No. 12-080

**Lessons of the Financial Crisis  
for the Attractiveness of  
European Financial Centers**

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## **Non-technical summary**

This empirical analysis addresses the attractiveness of European financial centers. The presented research tackles an issue that is fundamental to the understanding of organizational behavior in finance – the rationale in the decision-making process of market participants and its consequences for an economy. The results provide a unique insight into market participants' views on factors that affect the locational attractiveness of a financial center over time, taking into account assessments before, during, and after the financial crisis. This analysis of market participants' views is carried out by explaining their assessment of financial centers' attractiveness with their assessment of central influencing factors.

In particular, the results reveal that cluster concentration with a speedy information exchange within dense social networks is a competitive advantage. In comparison, an existing specialized pool of labor without concentration seems not to be relevant, as the human capital factor is relatively mobile in an increasingly integrated Europe. Furthermore, governmental support and parameters of regulation strongly determine a location's attractiveness for financial institutions, whereas the level of taxation seems not to be important on the micro level. Despite some progress in establishing a level playing field in the EU, the financial market is not yet fully harmonized and countries can take different paths in regulation as long as there is scope for interpretation. Hence, even minor differences in financial regulation within the EU may lead to regulatory arbitrage. Overall, financial centers' attractiveness varies over time, in comparison to relatively persistent location factors. The findings do not hinge on differences in market participants' socio-economic background. It is shown that fund companies seem to value the attractiveness of a financial center much more than banks, insurance companies, and corporates.

## Das Wichtigste in Kürze

Diese empirische Forschungsarbeit untersucht die Attraktivität von europäischen Finanzzentren. Damit soll diese Arbeit zu einem weiteren Verständnis des Organisationsverhaltens von Finanzintermediären beitragen. Es werden Erkenntnisse zum Entscheidungsprozess von Marktakteuren gewonnen, die gesamtwirtschaftliche Folgen für eine Volkswirtschaft haben. Die Ergebnisse bieten einen Einblick in die Ansichten von Marktteilnehmern zu Faktoren, die die standortbezogene Attraktivität eines Finanzzentrums über die Zeit beeinflussen können. Dabei werden die Einschätzungen vor, während und nach der Finanzkrise berücksichtigt. Die Beurteilung der Attraktivität wird durch Einschätzungen zu zentralen Einflussfaktoren erklärt.

Insbesondere zeigen die Ergebnisse, dass die Konzentration im Cluster mit einem schnellen Informationsaustausch in dichten sozialen Netzwerken einen Wettbewerbsvorteil darstellt. Im Vergleich scheint ein vorhandener Pool an spezialisierten Arbeitskräften, die nicht konzentriert vorhanden sind, irrelevant zu sein, da der Produktionsfaktor Arbeit als relativ mobil in einem zunehmend integrierten Europa angesehen wird. Darüber hinaus hat das Ausmaß staatlicher Unterstützung und die Regulierungsintensität einen starken Einfluss auf die Attraktivitätswahrnehmung, wobei das Besteuerungsniveau auf der Mikroebene hierfür nicht bedeutend ist. Trotz Fortschritten in der Schaffung gleicher Wettbewerbsbedingungen innerhalb der EU, ist der Finanzmarkt nicht vollständig harmonisiert. Interpretationsspielräume können daher in den Mitgliedsländern zu regulatorischer Arbitrage führen. Die Ergebnisse zeigen deutlich, dass die Attraktivität eines Finanzzentrums, im Vergleich zu relativ persistenten Standortfaktoren, im Laufe der Zeit stark variiert. Die Resultate hängen auch nicht vom sozioökonomischen Hintergrund der Marktteilnehmer ab. Marktteilnehmer einer Fondsgesellschaft messen allerdings der Finanzplatzattraktivität eine vergleichsweise stärkere Bedeutung zu.

# Lessons of the Financial Crisis for the Attractiveness of European Financial Centers

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*Abstract:* This paper analyses fundamental location factors for the financial industry by investigating the economic significance of market participants' assessments of location factors and country-specific characteristics over time. A unique data set allows studying the locational attractiveness of financial centers before, during, and after the recent financial crisis. The results reveal that especially dense networks in cluster concentration and governmental support strongly determine a location's attractiveness for financial institutions, whereas a specialized pool of labor alone without concentration and the level of taxation seem not to be relevant. Financial centers with a strong home market benefit during times of crisis in contrast to offshore centers and vice versa. Overall, financial centers' attractiveness varies over time, while the decisive location factors stay the same. The findings are not hinged by differences in market participants' socio-economic backgrounds. Investment fund companies seem to value the attractiveness of a financial center much more than banks, insurance companies, and corporates do.

*Keywords:* Financial Crisis, Financial Center, and Government Policy

*JEL-Classification:* G01, G20, G28, D22

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# 1 Introduction

The global financial crisis of the late 2000s demonstrated the inadequacy of the regulatory framework in safeguarding the financial system's stability and exerted enormous negative effects on the real economy. Financial institutions collapsed or were bought out; on a national level, governments were forced to respond rapidly with rescue packages in order to bail out their banking sector. Interestingly, a large fraction of the activities involving so-called "toxic assets," which essentially caused the crisis, were created by financial companies in financial centers, where, despite the spatial proximity of financial counterparties, concerns about counterparty credit risks spread quickly. In addition, there were significant amounts of job lay-offs in these centers. Financial centers are considered agglomerated bundles of the institutions responsible for capital and risk allocation of an economy, such as stock exchanges, banks, insurance and investment fund companies, or other service companies, such as consulting firms or software companies. A financial center can be defined as a nexus of ties between companies and institutions in a geographically defined area, which are involved in functions that enable and facilitate financial transactions (Lang, 2012: 31-32).

The rise and fall of major financial centers and their attractiveness per se are a topic of long-standing interest. They do not emerge out of nowhere or overnight. The financial industry has always been concentrated in a few cities whose respective significance has waxed and waned over time. Today, the earliest European capitals of money, such as Antwerps, Augsburg, Bruges, or Florence are of no more than local relevance, if any at all. Cities such as Paris or London have continued to be of great significance, and locations such as Luxembourg, Zurich, and Frankfurt have gained importance for the financial industry (e.g., Cassis, 2006). Interest in financial centers has been spurred on by the rise of new counterparts, such as the Asian former regional centers of Hong Kong, Seoul, Shanghai, and Singapore, to the preminent European hubs, as well as new financial centers in the Arab world (e.g., Qatar) seeking to establish an international presence.

Governments have reason to attract financial institutions and facilitate cross-border activities as these typically offer advantages to their host cities and countries, including higher paying jobs and increased personal income, wealth, and tax revenues. Several transmission channels allow further benefits due to the relationship of banking and the economy (e.g., Rajan and Zingales, 1998; Aghion et al., 2005 and 2009). Consequently, financial centers find themselves competing with each other, and each country tries to enhance its home markets'

attractiveness. Today, although several steps to establish a level playing field have been taken in Europe, the European financial market is not yet fully harmonized. Countries can take different paths when implementing key (regulation) issues, which may lead to a different quality of the business environment and thus to competition especially in cross-border banking activity (up to regulation arbitrage). For instance, corresponding critics outside the euro zone fear that EU regulation is designed to undermine their position and favor financial centers in mainland Europe. This includes efforts by the European Central Bank to force clearing houses that settle trades in Euros to locate in the euro zone (The Economist, 2011). The front-page story of The Economist (2012) in early 2012 reveals conceivable implications of stronger regulation and a possible new EU legislation for the British financial center. In the course of changes in regulation, higher taxes and public hostility, banking units have moved abroad or are on the verge of relocating, such as commodity traders and hedge funds to Switzerland.

This paper analyzes the attractiveness of major European financial centers, the influence of location factors on the quality of the microeconomic business environment and their impact on the attractiveness over time. The relevance of changes in location factors have thus far only been subject to speculation, but have never been measured empirically. The results provide a unique insight into experts' judgment of the European financial centers and decisive location factors before, during, and after the financial crisis. This paper provides new evidence about market participants' assessments, thus delving into the "decision rule" governing the operations of financial institutions.

The results show that the decisive part of the comparative advantage in a financial center lies outside the company and even outside its industry. The speedy information exchange within dense social networks increases attractiveness. In comparison, an existing specialized pool of labor without concentration seems not to be relevant, as the human capital factor is relatively mobile in an increasingly integrated Europe. Furthermore, the empirical evidence shows that the assessment of a financial center's attractiveness varies significantly over time. Nevertheless, the results also indicate that the decisive location factors are persistent over time. The attractiveness of the benchmark country Germany was higher at the peak of the financial crisis (it was acting as a safe haven in the European financial market), but lower after than before the financial crisis. However, the domestic sales market is a sufficient but not necessary condition for attractiveness. Support by the government strongly increases attractiveness. Consequently, the regulatory framework is an additional crucial determinant. On the other hand, the level of tax burden seems to be less important in competition between business locations. The results emphasize that in contrast to the location factors, the socio-

economic background of the actors (age, work experience, education, and location) is negligible, and the empirical findings cannot confirm differences in individual behavior. Nevertheless, the probability of reporting an increase in attractiveness is lower for market participants from fund companies, who tend to be more pessimistic about the attractiveness of a financial center than actors from other sectors. Interestingly, their impact is the strongest among all considered determinants. Thus, investment fund companies seem to value the attractiveness of a financial center much more than banks, insurance companies, and corporates.

The empirical approach is based on an ordered probit model. In order to compare experts' assessments about the relevance of location factors, around 300 market participants in the German financial sector were asked in four consecutive years, giving us a total number of 730 observations. The first survey was conducted at the end of 2007 and beginning of 2008, immediately preceding the collapse of Bears Stearns, Lehman Brothers, and the dramatic quantitative easing measures of the major central banks worldwide. The second and third surveys were conducted in early 2009 and 2010. The latest survey dates back to the beginning of 2011.

Economists have long been concerned with the way companies are restricted by the external environment (e.g., Coase, 1937; Williamson, 1985; Kogut and Zander, 1996). Simultaneously, a specific strand of research theory addresses the particular analysis of companies' agglomeration (e.g., Kaldor, 1972; Piore and Sabel, 1984; Krugman, 1991; Venables, 1996; Porter, 1990, 1998, 2000). Since the work of Reed (1981), many studies have been devoted to classifying financial centers and organizing them into a hierarchy (e.g., Poon et al., 2004). These studies often base their analysis on a set of quantitative characteristics, such as the number of foreign banks or market capitalization. However, that sort of approach has its limits. Although it allows for the comparison of a large number of financial centers, it fails to identify the particularly critical factors over time. Other studies are based on a detailed description of historical developments, findings through interviews and surveys (e.g., Abraham et al., 1994; Dietl et al., 1999, Bindemann, 1999; Harschar-Ehrnborg, 2002; Financial Center Initiative, 2003; Cassis, 2006; Geiger and Kappel, 2006; Lannoo, 2007). Sometimes they expose detailed comparisons between financial centers in Europe and the optimal design of an international financial center. However, many surveys are conducted in small groups of participants and usually each group only participates once. Hence, it is unclear

whether their findings are robust over time.<sup>2</sup> Therefore, this study seeks to close this research gap.

The structure of this paper is as follows. Chapter 2 describes the structure of the survey approach and the characteristics of the participating financial experts will be explained. To become familiar with the principal characteristics of the data a detailed descriptive impression on the findings will be given in Chapter 3. Afterwards in Chapter 4, an in-depth analysis of the results with a pooled ordered probit model will be provided. By calculating the marginal effects, it is possible to further measure the elements that might lead to attractiveness within the different assessment levels. Chapter 5 concludes.

## **2 Empirical Setting and Data**

This section presents the analysis of the data set. Therefore, in a first step the structure of the survey approach and the characteristics of the participating financial experts will be explained. The dataset consists of four surveys that were jointly conducted with the “ZEW Financial Market Survey,” which includes the internationally regarded German “ZEW indicator of economic sentiment.” It has been provided on a monthly basis since December 1991. About 350 financial analysts from banks, insurance and fund companies as well as industrial companies regularly participate in the survey the index is based on.<sup>3</sup>

For this work an additional questionnaire was developed and attached four times to the ZEW index. The first special survey for the purpose of this work was conducted at the turn of the year 2007/08, between December 8 and January 9, immediately before the collapse of Bear Stearns, Lehman Brothers, and the dramatic quantitative easing measures of major central banks.<sup>4</sup> Since then, the survey has been conducted annually, every January, until 2011. The survey provides an unbalanced panel dataset with 730 observations. Taking into account the individual years, 126 respondents have answered at the turn of the year 2007/08, 228 in 2009, 135 in 2010 and 241 in 2011.

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<sup>2</sup> The amount of literature which applies economic geography approaches on finance and banking in terms of their locations has also grown over the last two decades (e.g., Dow, 1990; Corbridge et al. 1994; Porteous, 1995; Thrift and Leyshon, 1997; Cohen, 1998; Laulajainen, 1998; Martin, 1999; Klagge and Martin, 2005; Clark, 2006; Gärtner, 2009; Capelle-Blancard and Tadjeddine, 2010; see Martin, 2011).

<sup>3</sup> Among the respondents are financial experts from research, economic and finance departments, fund managers and investment consultants (e.g., Schmidt and Nautz, 2012: 4-5).

<sup>4</sup> As it is important to formulate appropriate questions in a survey, the questionnaire design was aligned with the guidelines of Groves et al. (2009), Schaeffer et al. (2003), and Bradburn et al. (2004).

Figure 1 provides an overview of the chronological order of the surveys. The vertical solid lines display the points in time at which a survey was conducted. The historical sequel of some crucial events during the financial crisis is displayed by vertical dashed lines. Moreover, different performance stock indices (Dax30 and MSCI Europe) and central bank interest rates (ECB and FED) are considered as simple indicators for market sentiment. It is assumed that the participants in the sample were aware of these previous events and levels of financial indicators at the time of each survey. The first survey at the turn of the year 2007/08 is defined as “before,” the second survey in 2009 as “during” and the third and fourth surveys in 2010 and 2011 as “after” the financial crisis.

[insert Figure 1 about here]

The questionnaire was then used in a pre-test with market experts as a final check of its acceptance and appropriateness. The questionnaire, which was used for each survey from 2008 to 2011, consists of eight questions that aim at evaluating the attractiveness of financial centers and relevant location factors in theory and practice. The participants first gave a detailed, exemplary assessment of Germany, their domestic market, before they evaluated the aggregate fulfillment of location factors in the most important competing countries with hubs in Europe, which are France, Germany, Great Britain, Luxembourg, and Switzerland. The selected group of countries was chosen because it includes countries with different characteristics.<sup>5</sup>

All questions were to be answered on an ordinal scale with three to five ordered grades and the additional option to add further aspects missing from the questionnaire.<sup>6</sup> The used scale format follows the Likert bipolar scaling method that measures either positive or negative assessments to a statement.

Table 1 summarizes different location factors with their sub-criteria. Location factors can be determined and sorted by groups, which might be of particular relevance for the attractiveness of a financial center from the theoretical and empirical point of view. The development and interaction of these factors, influenced by changes in other countries, should explain the ups and downs in attractiveness.

[insert Table 1 about here]

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<sup>5</sup> Roughly, one can say that Great Britain is attractive for financial activities related to the capital market, Luxembourg is famous for the concentration of its asset management industry (with a small domestic market size), and Switzerland is well-known for its private banking, asset management activities as well as banking secrecy. Germany's financial industry is highly intertwined with the industry sector, and similar to France, also known for its large domestic market size in Europe.

<sup>6</sup> The ordinal scale provides sufficient details while not overstraining the respondents (Groves, 2009).

In addition to this first questionnaire, a second separate questionnaire was sent out once, in which survey participants were asked to give information on personal characteristics. At least 612 of 730 observations in total provided their personal data. Consequently, socio-economic characteristics data on 84 percent of the sample is available. Hence, it is possible to draw conclusions about how different personal characteristics influence market participants' assessment and whether the financial crisis affected individuals differently. An overview considering this socio-economic information is given in Table 2.

[insert Table 2 about here]

### **3 Descriptive Statistics**

Figure 2 gives a basic overview on the respondents' assessment of Germany as a financial center. Before the financial crisis, only 43 percent of participants considered Germany attractive or very attractive; the lion's share, with 45 percent, was merely neutral. Interestingly, in the year of the crisis in 2009 the image turned and 57 percent of the experts assessed the financial center as attractive or even very attractive. At the same time, the proportion of negative assessments dropped, so that about 36 percent gave a neutral opinion. The results of the 2010 survey do not differ much. However, the proportion of negative assessments increases somewhat. This trend continues in 2011, and the results are rather similar to the time before the financial crisis. Yet, a share of 41.2 percent continues to rate Germany as attractive or very attractive, accompanied with a peak on the negative side, as 17 percent of participants consider Germany (very) unattractive.

[insert Figure 2 about here]

The second question of the survey provides a picture of how the other European financial centers in focus are ranked. The results indicate a trend similar to the previous assessments of Germany. As can be seen in Figure 3, the share of negative estimates is the lowest in the crisis year of 2009. The same picture is given for France, also characterized by a large domestic market size; however, in general, the participants give France a more pessimistic outlook than the other countries. More than half of all respondents assess the environment in France as (very) unattractive, even after the crisis, in 2011, with a proportion of 86 percent. As such, both countries were deemed by the surveyed experts to have benefited

from the crisis. In case of an incipient improvement in market conditions, they would however suffer from a loss in popularity which would return them to pre-crisis circumstances.

A contrasting development is given for Luxembourg, Switzerland, and the United Kingdom. Before (2008) and after the crisis (2011), they were rated at their best levels. Hence, the worst-ranking countries France and Germany seem to be the winners of the crisis at the expense of the other three. Both countries' means went up in 2009 but subsequently fell again when the financial market began to recover from the crisis. It is evident that standard deviations increased in in the crisis for all countries, especially for France and the UK.

[insert Figure 3 about here]

Moreover, the participants have been asked, on the one hand, about the relevance of specific location factors from a theoretical point of view for an ideal financial center (depicted on the left-hand side of Figure 4) and, on the other hand, about the real levels for the benchmark financial center (depicted in Figure 4 on the right side). This comparison shows the difference between need and reality over time. At first glance, it is apparent that all factors have been assessed as important from a theoretical point of view. In particular, political and legal stability seem to play the most important role, while economic stability as well as supervisory and regulatory framework conditions are also rated high. These three factors also exhibit relatively low standard deviations, indicating a large consensus among the respondents. In contrast, most disagreement is observed for the relevance of soft factors and market potential, which are regarded as sufficient for the growth of a financial center. For the complete observed period, the cluster concentration of important market participants as well as the availability of human capital were both also rated important (greater than 1). Both factors have exhibited similar magnitude. The average results regarding location factor development indicate that location factors are relatively persistent over time. These results can be affiliated to a steady mindset during times of crisis. Yet, interesting differences can be identified. Average values for cost-related factors (taxation) and innovation potential dropped during the crisis and increased again afterwards. A different course can be observed for other factors. For instance, the need for legal and financial stability becomes more important during the crisis, as does the need for the concentration of other important market participants and soft factors in the cluster.

The levels of realization show a different picture for the benchmark financial center. Comparisons of the means indicate that all factors are seen in a worse light, whereas the results for soft factors at least distinguish between theory and practice. In particular, it appears

that the fiscal and regulatory frameworks in Germany differ the most from the theoretical need during the entire time period. In comparison, the assessments regarding the supervisory and regulatory framework have been interpreted as slightly lacking. However, the experts' assessments improve for both the crisis year and the subsequent year. The opinion also holds true for both human capital cluster factors. The realizations are relatively close to and consistent with theory on stability indicators regarding the political, economic and market environment. These results may reflect the broadly established financial industry in Germany and its relatively small proportion of the German value added.<sup>7</sup>

[insert Figure 4 about here]

## **4 Econometric Analysis**

### **4.1 Econometric Model and Testing**

In the next step, an econometric model provides an in-depth-analysis of the results. Financial experts have been asked about their view on the attractiveness of financial centers and the possible driving location factors for business activity. The objective is to model the assessment of financial centers' attractiveness as a function of the assessment of central influencing factors, such as regulatory and tax attractiveness, market concentration, governmental efforts, and so on. The empirical analysis is based on a pooled ordered probit model to account for the ordered outcomes of the dependent variable (categorical variable with five possible outcomes).

Multinomial logit or probit analyses would fail to account for the ordinal nature of the dependent variables. Ordinary regression techniques would err in the opposite direction, because they do not recognize the information content of one grade difference, i.e., estimation may vary along the used Likert scale. For example, the linear regression model would treat the difference between 1 and 2 in the same way as the difference between 2 and 3, whereas in fact the ordinal difference might be greater or smaller. Therefore, an ordered probit model is

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<sup>7</sup> For further results of this analysis, see Lang (2012): Basically, the surveyed experts assess government efforts in Germany on a five-step scale of school grades between "one" (i.e., A=excellent) and "five" (i.e., F=fail) with poor grades (see Figure 5). Exactly 50 percent of respondents assessed government efforts with the grades "four" or "five" (D or F) before the crisis.

estimated, as initially proposed by McKelvey and Zavoina (1975), which is able to account for the ordered differences among the response categories (see Greene, 2012).

Formally, the latent regression of the ordered probit model is specified as follows:

$$Y_{it}^* = \alpha_i + \beta' X_{it} + \varepsilon_{it}$$

The following categories are then assigned to the unknown  $Y^*$  :

$$\begin{aligned} Y_{it} &= 1, \text{ if } Y_{it}^* \leq z_1, \\ Y_{it} &= 2, \quad \text{if } z_1 < Y_{it}^* \leq z_2, \\ Y_{it} &= 3, \quad \text{if } z_2 < Y_{it}^* \leq z_3, \\ Y_{it} &= 4, \quad \text{if } z_3 < Y_{it}^* \leq z_4, \\ Y_{it} &= 5, \quad \text{if } z_4 \leq Y_{it}^*. \end{aligned}$$

where  $z$  is an unknown threshold that defines, which values of  $Y^*$  correspond to the observable outcome  $Y$ . The thresholds  $z_1$  to  $z_4$  themselves are unknown and will be estimated along with the parameters  $\beta$  and  $\alpha$ .  $X$  is a matrix of the independent variables for each individual  $i$ ,  $\alpha_i$  is the constant term, and  $\varepsilon$  a normally distributed error term. The underlying assumption is that the five respondent categories are ordered from the lowest to the highest level and that the threshold levels are positively increasing as  $0 < z_1 < z_2 < \dots < z_5$ .

Taking this into account, the probability function of  $Y_{it}$  has the following form:

$$\begin{aligned} \text{Prob}(Y_{it} = 1) &= \text{Prob}(Y_{it}^* \leq z_1) = \Phi(-\beta' x_{it}), \\ \text{Prob}(Y_{it} = 2) &= \text{Prob}(z_1 < Y_{it}^* \leq z_2) = \Phi(z_2 - \beta' x_{it}) - \Phi(-\beta' x_{it}), \\ \text{Prob}(Y_{it} = 3) &= \text{Prob}(z_2 < Y_{it}^* \leq z_3) = \Phi(z_3 - \beta' x_{it}) - \Phi(z_2 - \beta' x_{it}), \\ \text{Prob}(Y_{it} = 4) &= \text{Prob}(z_3 < Y_{it}^* \leq z_4) = \Phi(z_4 - \beta' x_{it}) - \Phi(z_3 - \beta' x_{it}), \\ \text{Prob}(Y_{it} = 5) &= \text{Prob}(z_4 \leq Y_{it}^*) = 1 - \Phi(z_5 - \beta' x_{it}). \end{aligned}$$

where  $\Phi$  represents the standard normal cumulative distribution. Furthermore, the marginal effects are estimated to assess the effects of changes in the covariates on the response probabilities. The marginal effects from every independent variable, evaluated at their means, are calculated as follows:

$$\begin{aligned}\frac{\partial \text{Prob}(Y_{it} = 1)}{\partial x_{it}} &= -\phi(-\beta' \cdot x_{it}) \cdot \beta \\ \frac{\partial \text{Prob}(Y_{it} = 2)}{\partial x_{it}} &= [\phi(-\beta' \cdot x_{it}) - \phi(z_2 - \beta' \cdot x_{it})] \cdot \beta \\ \frac{\partial \text{Prob}(Y_{it} = 3)}{\partial x_{it}} &= [\phi(z_2 - \beta' \cdot x_{it}) - \phi(z_3 - \beta' \cdot x_{it})] \cdot \beta \\ \frac{\partial \text{Prob}(Y_{it} = 4)}{\partial x_{it}} &= [\phi(z_3 - \beta' \cdot x_{it}) - \phi(z_4 - \beta' \cdot x_{it})] \cdot \beta \\ \frac{\partial \text{Prob}(Y_{it} = 5)}{\partial x_{it}} &= \phi(z_5 - \beta' \cdot x_{it}) \cdot \beta\end{aligned}$$

with  $\phi$  being the standard normal density. Based on the theoretical specifications described above, the following model is estimated by ordered probit:

$$\begin{aligned}Y_{it} = & b_0 + b_1 \text{MARKET}_{it} + b_2 \text{CONCENTRATION}_{it} + b_3 \text{TAX}_{it} + b_4 \text{HUMANCAPITAL}_{it} + b_5 \\ & \text{REGULATION}_{it} + b_6 \text{STABPOL}_{it} + b_7 \text{STABECON}_{it} + b_8 \text{INNOVATION}_{it} + b_9 \text{SOFTFACTS}_{it} + b_{10} \\ & \text{GOVC}_{it} + b_{11} \text{GOVY}_{it} + b_{12} \text{AGE}_{it} + b_{13} \text{JOBEX}_{it} + b_{14} \text{FINEX}_{it} + b_{15} \text{UNI}_{it} + b_{16} \text{FINCENTER}_{it} + b_{17} \\ & \text{FUNDCOMPANY}_{it} + b_{18} \text{INSURANCE}_{it} + b_{19} \text{CORPORATE}_{it} + b_{20} \text{YEAR2009}_{it} + b_{21} \text{YEAR2010}_{it} + b_{22} \\ & \text{YEAR2011}_{it} + \varepsilon_{it}\end{aligned}$$

where

$i = 1, \dots, N_t$ , represents each individual respondent,

$t = 1, \dots, T$ , represents the time period,

$\varepsilon_{it}$  = represents the individual-specific and time-specific, normally distributed error term.

Y is the ordered, observed dependent variable that represents the overall attractiveness of a country as a financial center as reported by the financial experts. To determine the

relevance of the location factors, the German respondents ought to be most familiar with the domestic characteristics. Y is the result of the experts' answers to the first question. The answer categories range from 1 to 5, where 1 means very unattractive and 5 means very attractive. The greater the value for Y, the higher the rating assessment of Germany as a financial center becomes. The independent variables are composed of three parts and are summarized in Table 3.

[insert Table 3 about here]

Dummy variables are used to determine the progress of assessments and the impact of the financial crisis. Note that the benchmark is the level before the crisis (YEAR 2008). The work tests whether the assessments after the crisis match the pre-crisis level, or whether a fundamentally different view has been formed (YEAR 2010 and YEAR 2011). The findings in the descriptive results suggest an increase in attractiveness during the financial crisis and thus a positive sign of the coefficients of the dummy variables, due to diversification advantages in the economy.

Question two of the survey deals with the influence of specific location factors on overall financial center attractiveness. To estimate this influence, the experts were asked about the benchmark's location factors' performance in comparison to international competition. Answer categories range from levels 1 to 5, where 1 means "much worse" and 5 means "much better," respectively.

The majority of these independent variables should have a positive impact on Y because, from a theoretical point of view, their increase is always accompanied with an increase in attractiveness. Therefore, the hypothesis is that the sign of the influence of these factors is always positive.

There are numerous benefits of a cluster<sup>8</sup> associated with the proximity to other market participants, greater access to information flows, and lower coordination costs. Porter (1998, 2000) shows that among individuals, geographical and cultural proximity as well as close institutional terms lead to advantages in productivity growth and entrepreneurial activity due to, e.g., special relationships with better incentives and information that are difficult to tap from a distance. The network of companies and public institutions leads to many cluster

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<sup>8</sup> It is broadly recognized that the observed spatial configuration of economic activities is in general the outcome of a process involving two opposing types of forces. These centripetal (agglomeration) and centrifugal (dispersion) forces lead to a balance of forces that push and pull consumers and companies (Fujita and Thisse, 2002: 5).

advantages, which have positive externalities or spillover effects across companies and industries.

Dense social networks provide strong reasons for agglomeration, for example clustering in the Silicon Valley (i.e., “you can change jobs without changing the parking lots”). Saxenian (1994) pointed out that the region was essentially identical to Boston (Route 128) in the 1970s. However, the two locations did not have identical characteristics. Offering an entrepreneurial culture of rapid changes and quick decisions, the Silicon Valley subsequently transformed into a relatively more productive environment.

Dense clique-like local networks are strengthened over time by shared beliefs and perceptions (mental models), e.g., of how markets work, and enable market participants to interpret the behavior of others (Baum et al., 2003: 702). Zaheer and Bell (2005) analyze syndicate networks of Canadian mutual fund companies and find that cognitive embeddedness and the formation of mental models within clique-like interconnected market participants lead to persistent network structures.

Granovetter (2005) gives further evidence that social networks in general affect economic outcome, as they (1) improve the flow and quality of information, (2) facilitate reward and punishment mechanisms, and (3) foster trust among market participants. Florida and Gates (2001) examine the effects of soft location factors, such as cultural diversity. They find that clusters with a culture of openness tend to innovate more than less creative cities.

Since knowledge becomes more specialized over time, a cluster-specific division of labor and institutional organization enables the emergence of distinctive approaches to learning and knowledge creation (see Bell et al., 2009: 624-625). Corresponding findings show that the strength – and not just the existence – of relationships between market participants in a cluster is crucial for enabling the exchange of private information and the privileged interpretation of market information to result in knowledge spillovers. Formal business collaborations enhance socialization and foster an informal relationship between market participants (Gulati and Puranam, 2009).

Finally, the paper exploits the influence of socio-economic factors on the assessments of attractiveness. For this purpose the required data about the experts were subsequently collected. In particular, age (AGE), level of education (UNI) and the associated professional and specific experience in the business world (JOBEX and FINEX) are measured with control variables. The literature seems to indicate that experienced as well as older individuals are more reluctant to change their beliefs over time (Niessen et al., 2010). For this reason a

significantly different response behavior between experienced and inexperienced individuals is expected.

The influence of geographical location is of particular interest to the investigation. Individuals inside the financial center may have greater knowledge about comparative advantages of financial centers. According to Gulati and Gargiulo (1999), new relationships are attracted more strongly by existing close ties and the parties' partners. This leads to an environment of social embedding due to processes of indirect referrals and trust formation. In the course of collaboration within the cluster, the interaction between market participants through jointly attended (in-) formal events and meetings further shape their mental maps and thus their subsequent behavior (i.e., Weick et al., 2005). Therefore, this analysis tests whether office location, in or outside the major financial center (FINCENTER), alters the results.

Thus, it is possible that these experts experienced the crisis differently. If there are differences in the assessment of attractiveness due to the industry an expert belongs to, the sector dummy variables should be significant. Working for a bank (BANKS) is the benchmark. However, the German fund industry is often characterized as a large domestic market, whereas the distribution of funds often differs from the domiciliation due to disparities in environment conditions (e.g., Luxembourg and Dublin; see Lang and Köhler, 2011). Therefore, a negative sign for FUNDCOMPANY is expected.

## **4.2 Empirical Results**

The empirical analysis proceeds in several steps. In the first step of the examination the paper uses time dummy variables to check whether the assessments of financial experts have changed over time. The estimated results are given in Model 1 of Table 4. For deeper insight, other factors are considered in the next step, namely the individual reviews of location factors and socio-economic background information of the experts. The results of this estimation are presented in models 2 to 4 of Table 4. The problem of multicollinearity appears not to exist, since the correlation among explanatory variable is not high. The estimation of the same models with robust standard errors leads to very similar results and are therefore not reported. The results seem to be robust, since the estimates do not vary much across the models.

[insert Table 4 about here]

### 4.3 Time Effects

A simple model only taking into account the time dummies is estimated to determine the temporal variability of Y (Model 1). This analysis gives evidence that the attractiveness of a financial center is time variant. The results in Model 1 indicate that the attractiveness during the financial crisis (YEAR 2009) is greater than before and after the crisis. This effect turns around, so that after the crisis (YEAR 2011) the coefficient is significant and negative at the 5-percent level in all models. This means that Germany's attractiveness was greatest at the peak of the financial crisis in 2009.

### 4.4 Comparison of Location Factors

The results of further analysis suggest that several location factors have a direct impact on the overall assessment of a financial center. The descriptive analysis in Chapter 3 indicates that decisive location factors are relatively stable over time. Can this statement be confirmed by econometric analysis? The results confirm the expectations and indicate that strength and size of an economy, denoted in the variable MARKET, influence attractiveness. The coefficient is positive and significant in both models. Hence, the domestic sales market is at least a sufficient condition for the size of a financial center.

CONCENTRATION is positive and significant on the 1-percent significance level in all models. The results confirm the expectations and show that a concentration of important market participants in the financial center promotes its overall attractiveness.

In addition, this work tests whether tax issues (TAX) are relevant for attractiveness. But the results show no direct relationship between the structure of the tax system and attractiveness. This corresponds to the assessments of interviewees in the pre-test, since they particularly pointed out that continuity in taxation is often much more important for their businesses than the level of taxation. Changes in the level of taxation increase planning uncertainty and provoke cost-intensive process adjustments in each financial institution. However, the existing double tax treaty may significantly reduce the influence of different system structures.<sup>9</sup>

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<sup>9</sup> Brulhart and Jametti (2006) emphasize that either harmonization reduces the tax base, which compels a benevolent government to restrict public goods, or competition improves welfare because it constrains big governments. Regarding the issue of the corporate tax level, Becker and Fuest (2011) show that the optimal tax policy for a government to prevent companies from leaving the country depends on how profitable mobile companies are, relatively to immobile companies in a country. Moreover, they show that a tax rate cut cum

The also non-significant result on the availability of qualified employees and knowledge transfers (HUMANCAPITAL) may have similar reasons. The result implies that the attractiveness of a financial center does not directly rely on the local supply of labor. In the financial sector companies can recruit the required labor across national borders. This result could be motivated by an increasing possibility of labor movement with fewer regulations on labor issues, particularly in the EU.

The results give strong evidence that supervisory and regulatory conditions are relevant for the attractiveness of a financial center. This was expected. The variable REGULATION is positive and significant at the 5-percent level in the models. This result suggests that small regulatory differences, in contrast to tax differences, may lead to more geographical consequences, in terms of regulation arbitrage.

Furthermore, the experts were also consulted on the stability level of the political and legal system (STABPOL) and on the stability of the overall economic system (STABECON). The latter stands e.g. for price stability and economic development; however, these variables are insignificant. The variables are possibly not relevant because these indicators are very similar across all countries in focus. The potential for innovation and innovative ability (INNOVATION) in terms of new markets (private equity and venture capital, hedge funds) have no direct impact on attractiveness. The respective variable is positive but insignificant. This might be because, compared to the technical progress, innovations in the area of finance have a certainly significantly less “depth,” and can thus not be patented. The development of the so-called soft factors (SOFTFACTS), however, has a positive and slightly significant effect on the 15-percent level in Model 4. This corresponds to the expectations about its impact, such that a pleasant living environment (living quality, language, culture, spare time activities) positively influences the attractiveness of a financial center.

Aspects of the business environment are not always sector-specific but rather cut across all industries. Hence, the effects of government initiatives are not necessarily only relevant for the financial sector. Varying specific efforts regarding the financial industry, which can be distinguished in hard (i.e., regulation) and soft (i.e., marketing) measures, have different effects.

Descriptive results have illustrated that the respondents are very dissatisfied with government efforts to create a favorable environment. The variables in the econometric

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base broadening policy in a country increases welfare by redistributing the tax burden from mobile to immobile companies if the marginal mobile company is more profitable than the average company, and vice versa. But in reality governments may not be able to observe a company’s mobility level.

analysis regarding the assessments of government efforts are divided into two questions, one on the very short-term implementations (GOVC) and one on efforts made in the last two years (GOVY). The results of the analysis show that government efforts are considered very important for the growth of a cluster. The corresponding coefficients in the models have positive signs and are weakly significant (on the 10-percent level) for short-term efforts and strongly significant (on the 1-percent level) for the longer term. Nevertheless, the overall findings contradict the assumptions in the literature about globalized financial markets with no or less and less room for governmental maneuvers (e.g., Sassen, 1999; Porter, 2000).

#### **4.5 Socio-Economic Background**

In the next step of the analysis, this paper checks whether socio-economic characteristics have an impact on the assessment of financial centers' attractiveness. The results show that in contrast to location factors the socio-economic background of the respondents is negligible. The horizon of experience does not determine the empirical results, so that differences in the characteristics of age (AGE), level of education (UNI) and the associated professional and specific experience in the business world (JOBEX and FINEX) are irrelevant. As opposed to the general literature (i.e., senior managers would be more reluctant to change their beliefs and managers earlier in their careers have less established beliefs; the empirical findings cannot confirm differences in behavior. Moreover, experts geographically located in and outside financial centers (FINCENTER) do not seem to have different mindsets, either. Working for a BANK, INSURANCE or a CORPORATE does not matter at all.

Interestingly, however, a clear difference can be found for employees of a fund company. Fund companies generally judge the attractiveness of the financial center negatively. This meets the expectations of a specific view in this specific industry. In all models the coefficient for FUNDCOMPANY is negative and strongly significant at the 1-percent level.

#### **4.6 Overall Fit of the Models**

To test the relative strength of the models, this analysis uses a Likelihood Ratio test (LR test) to examine the group-specific heterogeneity in Table 4 (see Greene, 2012). The LR test compares the log likelihoods of two models and tests whether this difference is statistically significant. If the difference is statistically significant, then the less restrictive model is said to fit the data significantly better than the more restrictive model (the one with less variables).

The LR test was conducted in a restricted model with the same number of observations (472). The LR test shows that the differences between models (4) and (3), (2) or (1) are significant at the 1-percent level. According to the values of the log likelihood function and the results of the LR tests, the most general model (4) is the preferred one.

#### **4.7 Marginal Effects**

In the next step, the influence of the variance of the independent variables on the dependent variable is analyzed per unit. By calculating the marginal effect, it is possible to further determine the elements that might lead to attractiveness within the different assessment levels. Table 5 presents the results on the marginal effects. These findings support the previous results; the signs of the marginal effects are mostly consistent with the signs of the coefficients presented in Table 4. The results of the marginal effects (Table 5) are demonstrated regarding the individual questionnaire categories from (1) to (5). Overall, the probability of reporting an increase in attractiveness of a financial center (choosing category 4 or 5 – attractive or very attractive – in the questionnaire) rises with market size, concentration of important market participants, better regulatory framework and greater efforts by the government. On the other hand, the probability decreases for respondents from fund companies, who tend to be more pessimistic about the attractiveness of a financial center than respondents from other sectors. Interestingly, their impact is the strongest among all considered variables. Thus, investment fund companies seem to value the attractiveness of a financial center much more than banks, insurance companies, and corporates.

[insert Table 5 about here]

## **5 Conclusion**

This paper aims to help explain the puzzle of financial centers' attractiveness. In order to achieve this, the discussion sheds light on the quality of microeconomic business environments and their relationship with influencing location factors over time. The results provide a unique insight into experts' judgment on location factors and European financial centers before, during, and after the financial crisis. Due to the time period covered, it provides deeper understandings of changing views regarding the general determinants relevant to financial intermediaries, which to a great extent depend on several external conditions. Thus,

the findings fill the gap of variations in the relevance of location factors, which have previously not been empirically analyzed and have hence been subject to speculation.

First, the empirical evidence shows that the assessment of a financial center's attractiveness varies significantly over time. An important implication of this study is that it appears that countries considered least attractive before the recent financial crisis (i.e., Germany and France) caught up during the crisis but afterward plummeted even below pre-crisis levels. Conversely, it also appears that countries considered most attractive before the crisis regained or exceeded their advantage after the crisis. This applies to countries with very specialized financial centers and which are heavily reliant on financial exports (i.e., London, Luxembourg), which as such offer competitive advantages even in normal times.

Second, the relevant location factors are persistent. The results show that the decisive part of the comparative advantage in a financial center lies outside the company and even outside its industry. The speedy information exchange within dense social networks increases attractiveness. In comparison, an existing specialized pool of labor without concentration seems not to be relevant, as the human capital factor is relatively mobile in an increasingly integrated Europe.

Further, this analysis does not find that governments have lost their influence on competition to global forces. Support by the government strongly increases the attractiveness of a location; however, the advantage is due more to the regulation framework than the level of the tax burden. Market size can positively affect attractiveness, but is not a prerequisite.

Third, the variation in the socio-economic background of market participants is negligible and cannot indicate different individual behavior. Intriguingly, fund companies tend to be more pessimistic about financial centers' attractiveness than respondents from other sectors and their impact is the strongest among all considered sectors.

Overall, direct policy recommendations can be drawn out of the findings, as financial centers do not emerge out of nowhere or overnight. The results emphasize that, in order to explain the emergence of financial centers in specific regions, it is nevertheless necessary to focus on former companies' early decisions, and on how other companies later make subsequent location decisions because of the advantages of spatial proximity to the early arrivals. These lock-in effects very often lead to inefficiencies as they do not induce institutions to relocate even if another location provides more favorable conditions. The consequence of their relocation decision depends on the mobility level of the individual institution.

## REFERENCES

- ABRAHAM, J.-P., N. BERVAES, and A. GUINOTTE (1994): *The Competitiveness of European International Financial Centers*, in: J. REVELL (Ed.), *The Changing Face of European Banks and Securities Markets*, Macmillan, Basingstoke.
- AGHION, P., N. BLOOM, R. BLUNDELL, R. GRIFFITH, and P. HOWITT (2005): Competition and Innovation: An Inverted-U Relationship, *Quarterly Journal of Economics*, 120(2), 701-728.
- AGHION, P., R. BLUNDELL, R. GRIFFITH, P. HOWITT, and S. PRANTL (2009): The Effects of Entry on Incumbent Innovation and Productivity, *The Review of Economics and Statistics*, 91(1), 20–32.
- BAUM, J.A.C., A. V. SHIPILOV, AND T. J. ROWLEY (2003): Where Do Small Worlds Come From?, *Industrial and Corporate Change*, 12 (4).
- BECKER, J. and C. FUEST (2011): Optimal Tax Policy when Firms are Internationally Mobile, *International Tax and Public Finance*, 18(5), 580-604.
- BELL, S., J. P. TRACEY, and J. B. HEIDE (2009): The Organization of Regional Clusters, *Academy of Management Review*, 34 (4), 623-642.
- BINDEMANN, K. (1999): *The Future of European Financial Centres*, Routledge, London.
- BRADBURN, N., S. SUDMAN, and B. WANSINK (2004): *Asking Questions*, San Francisco, Jossey-Bass.
- BRULHART, M. and M. JAMETTI (2006): Vertical versus horizontal tax externalities: An empirical test, *Journal of Public Economics*, Elsevier, 90(10), 2027-2062.
- CAPELLE-BLANCARD, G. and Y. TADJEDDINE (2010): The Urban Location of Financial Activities, *Working Paper*, University Paris 1 Panthéon-Sorbonne.
- CASSIS, Y. (2006): *A History of International Financial Centres: 1780-2005*, Cambridge University Press, Cambridge, MA.
- CLARK, G. L. (2006): *Setting the agenda: the geography of global finance*, in: BAGCHISEN, S. and H. LAWTON-SMITH (Eds.): *Economic Geography: Past, Present and Future*, Routledge, London, 83–93.
- COASE, R. H. (1937): The Nature of the Firm, *Economica*, New Series, 4(16), Nov. 1937, 386-405.
- COHEN, B. J. (1998): *The Geography of Money*, Cornell University Press, Ithaca, London.
- CORBRIDGE, S., R. L. MARTIN, and N. THRIFT (Eds.) (1994): *Money, Power and Space*, Blackwell, Oxford.
- DIETL, H. M., M. PAULI, and S. ROYER (1999): *Internationaler Finanzplatzwettbewerb – Ein Ressourcenorientierter Vergleich*, Gabler, Wiesbaden.

- DOW, S. (1990): *Financial Markets and Regional Economic Development*, Avebury, Aldershot.
- FINANCIAL CENTER INITIATIVE (2003): *Finanzplatz Zürich: Eine ungewisse Zukunft*, Office for Economy and Labour.
- FLORIDA, R. and G. GATES (2001): *Technology and Tolerance: The Importance of Diversity to High-Tech Growth*, Brookings Institution, Washington DC.
- FUJITA, M. and J.-F. THISSE (2002): *Economics of agglomeration: Cities, industrial location and regional growth*, Cambridge University Press, Cambridge.
- GÄRTNER, S. (2009): Balanced Structural Policy: German Savings Banks from a Regional Economic Perspective, Brussels: World Savings Banks Institute, *Perspectives*, 58.
- GEIGER, H. and V. KAPPEL (2006): *Innovationen im Finanzsektor – eine Untersuchung am Finanzplatz Schweiz*, Studie im Auftrag des Arbeitskreises Kapital und Wirtschaft (akw), Universität Zürich.
- GRANOVETTER, M. (2005): The Impact of Social Structure on Economic Outcomes, *Journal of Economic Perspectives*, 19(1), 33-50.
- GREENE, W.H. (2012): *Econometric Analysis*, Prentice Hall.
- GROVES, R. M., F. J. FOWLER, M. P. COUPER, J. M. LEPKOWSKI, E. SINGER, and R. TOURANGEAU (2009): *Survey Methodology*, John Wiley and Sons, Hoboken, New Jersey.
- HARRSCHAR-EHRNBORG, S. (2002): *Finanzplatzstrukturen in Europa*, Peter Lang,
- KALDOR, N. (1972): The Irrelevance of Equilibrium Economics, *Economic Journal*, 82 (328), 1237-1255.
- KLAGGE, B. and R. MARTIN (2005): Decentralized versus Centralised Financial Systems: Is there a Case for Local Capital Markets, *Journal of Economic Geography*, 5(4), 387–421.
- KOGUT, B. and U. ZANDER (1996): What firms do? Coordination, identity, and learning, *Organization Science*, 7(5), 502-518.
- KRUGMAN, P. (1991): Increasing Returns and Economic Geography, *Journal of Political Economy*, 99(3), 483–499.
- LANG, G. and M. KÖHLER (2011): How Does the Domiciliation Decision Affect Mutual Fund Fees?, *ZEW Discussion Paper*, 11-085, Mannheim.
- LANG, G (2012): *Empirical Analysis of the Macro Attractiveness and Micro Decisions in the Mutual Fund Industry*, Dissertation at University of Stuttgart.
- LANNOO, K. (2007): The Future of Europe's Financial Centers, *ECMI Policy*, Brief No. 10.
- LAULAJAINEN, R. (1998): *Financial Geography*, Goteborg University Press, Goteborg.

- MARTIN, R. L. (2011): The local geographies of the financial crisis: from the housing bubble to recession and beyond, *Journal of Economic Geography*, 11, 587–618.
- MARTIN, R. L. (Ed.) (1999): *Money and the Space Economy*, John Wiley, Chichester.
- MCKELVEY, R. and W. ZAVOINA (1975): A Statistical Model for the Analysis of Ordinal Level Dependent Variables, *Journal of Mathematical Sociology*, 4, 103-120.
- PIORE, M. J. and C. F. SABEL (1984): *Second industrial divide: Possibilities for prosperity*, Basic Books, New York.
- POON, J. P. H., D. ELDREDGE, and D. YEUNG (2004): Rank Size Distribution of International Financial Centres, *International Regional Science Review*, 27(4), 411-430.
- PORTEOUS, D. J. (1995): *The Geography of Finance: Spatial Dimensions of Intermediary Behaviour*, Avebury, Aldershot.
- PORTER, M. E. (1990): *The Competitive Advantage of Nations*, The Free Press, New York.
- PORTER, M. E. (1998): *Clusters and competition: New agendas for companies, governments, and institutions*, in: M. PORTER (2008), *On competition* (197-287), Harvard Business School Press, Boston, MA.
- PORTER, M. E. (2000): Location, Competition, and Economic Development: Local Clusters in a Global Economy, *Economic Development Quarterly*, 14(1), 15-34.
- RAJAN, R. and L. ZINGALES (1998): Financial dependence and growth, *American Economic Review*, 88, 559-586.
- REED, H. C. (1981): *The preeminence of international financial centers*, Praeger, London.
- SASSEN, S. (1999): Global Financial Centers, *Foreign Affairs*, 78(1), 75-86.
- SAXENIAN, A. (1994): *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, Harvard University, Cambridge.
- SCHAEFFER, N. C. and S. PRESSER (2003): The Science of Asking Questions, *Annual Review of Sociology*, 29, 65-88.
- SCHMIDT, S. and D. NAUTZ (2012): Central Bank Communication and the Perception of Monetary Policy by Financial Market Experts, *Journal of Money, Credit, and Banking*, 44, 323-340.
- THE ECONOMIST (2011): *London as a financial centre - Banged about*, October 29th 2011, The Economist.
- THE ECONOMIST (2012): *Save the City*, January 7th 2012, The Economist
- THRIFT, N. and A. LEYSHON (1997): *Money/Space*, Routledge, London.
- VENABLES, A. (1996): Equilibrium Locations of Vertically Linked Industries, *International Economic Review*, 37(2), 341–359.

WEICK, K. E., K. M. SUTCLIFFE, and D. OBSTFELD (2005): Organizing and the Process of Sensemaking, *Organization Science*, 16(4), 409-421.

WILLIAMSON, O. E. (1985): *The Economic Institutions of Capitalism*, Free Press, New York.

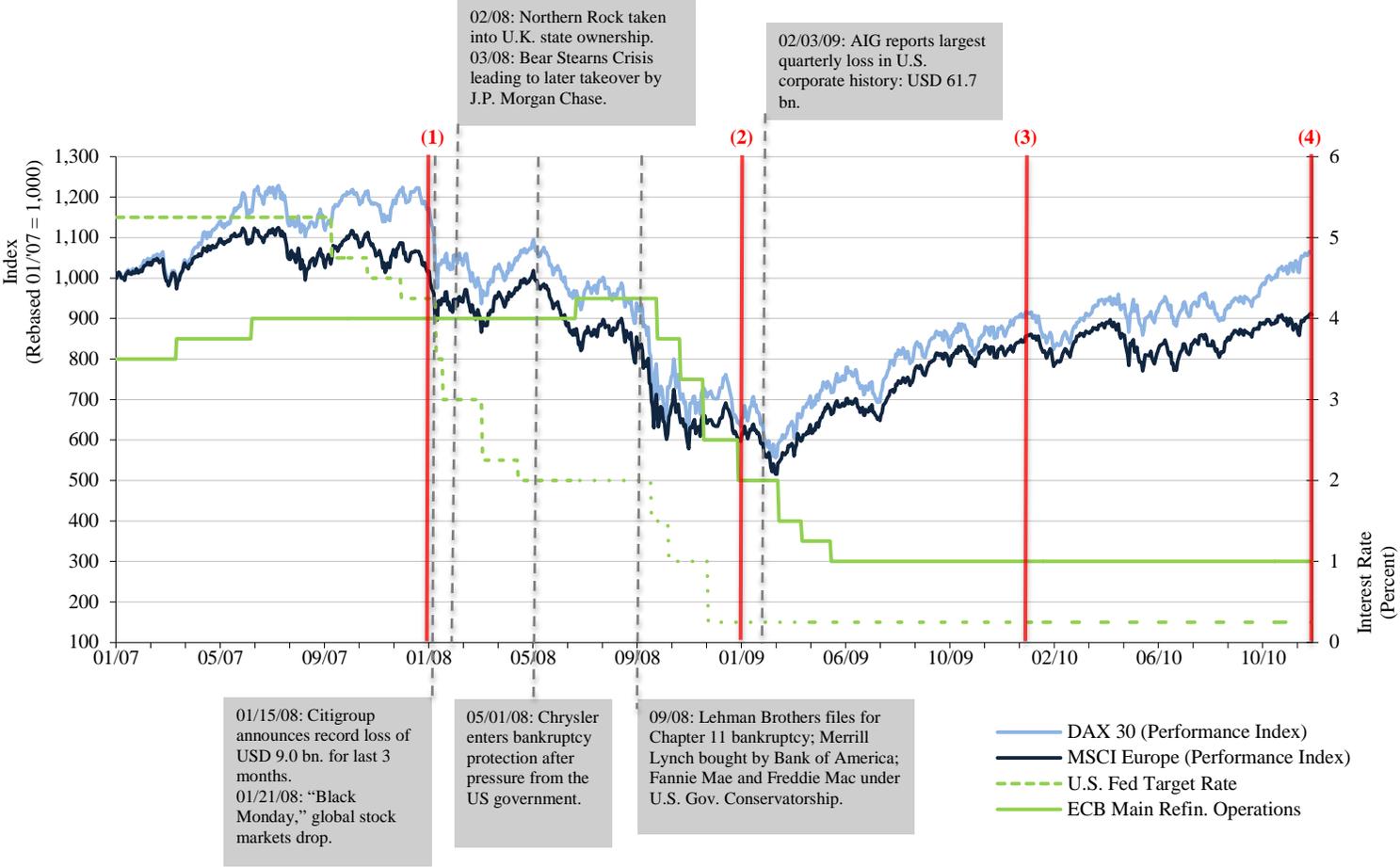
# APPENDIX

**Table 1: Regime of Location Factors**

<b>Core criterion</b>	<b>Sub-criteria</b>
<b>Market size</b>	<ul style="list-style-type: none"> <li>- Size of the domestic market (e.g., economic power, employment level, purchasing power, capital market)</li> </ul>
<b>Cost-related framework conditions</b>	<ul style="list-style-type: none"> <li>- Costs for permissions and levy to run a business</li> <li>- Taxes (e.g., corporate taxation, taxation of highly qualified employees, taxation of capital income, transaction taxes)</li> <li>- Labor costs (e.g., wages, salaries, social security contributions and other levies)</li> <li>- Infrastructure and accessibility (e.g., airports, train connections, communication and information technology)</li> <li>- Costs for office real estate</li> </ul>
<b>Cluster</b>	<ul style="list-style-type: none"> <li>- Concentration of market participants (e.g., banks, insurance and fund companies)</li> <li>- Proximity to service providers (e.g., communication and information technology, business consulting, marketing, press)</li> <li>- Proximity to related institutions (e.g., stock exchanges, regulator, government)</li> </ul>
<b>Human capital and knowledge</b>	<ul style="list-style-type: none"> <li>- Specialized labor supply</li> <li>- Education level</li> <li>- Innovation potential</li> <li>- Research institutions quality of surrounding universities in economic and fiscal research</li> </ul>
<b>Political and legal framework conditions</b>	<ul style="list-style-type: none"> <li>- Regulation of the financial industry, supervisory conditions, legal security, bureaucracy, banking secrecy</li> </ul>
<b>Positioning of prospect fields / innovation</b>	<ul style="list-style-type: none"> <li>- E.g. Private equity and venture capital, hedge funds</li> </ul>
<b>Soft factors</b>	<ul style="list-style-type: none"> <li>- Quality of living</li> <li>- Attractiveness of regions for high potentials</li> <li>- Multiculturalism</li> <li>- Language</li> </ul>

Source: Organized by the author.

**Figure 1: Survey Timeframe, main Economic Events, and Financial Indicators**



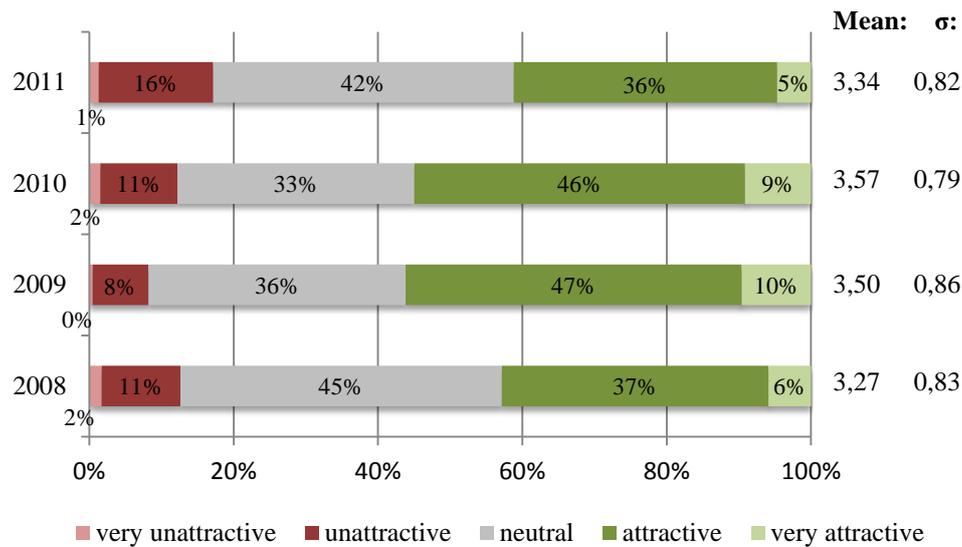
Source: Own illustration; the vertical solid lines (in red) illustrate the points in time of the four surveys; the vertical dashed lines (in grey) illustrate major economic events during the financial crisis; all stock market indices are based on 1,000 in January 2007.

**Table 2: Sample Description**

Item asked	Responses (in %)	Number of Responses*		
<u>Gender</u>				
male: 94.7 %	female: 5.3 %	620		
<u>Age (in years)</u>				
<40: 20.9 %	40-50: 43.8 %	>50: 35.3 %	mean: 47.4	612
<u>University Degree</u>				
yes: 70.7 %	no: 29.3 %	618		
<u>Professional Experience in General (in years)</u>				
<15: 15.7 %	15-25: 45.8 %	>25: 38.5 %	mean: 24.3	618
<u>Professional Experience in Financial Markets (in years)</u>				
<15: 31.0 %	15-25: 48.4 %	>25: 20.6 %	mean: 20.2	620
<u>Industry</u>				
Banks: 62.5 %	Fund companies: 12.3 %	730		
Insurance companies: 7.5 %	Corporates: 17.7 %			
<u>Located in major financial center**</u>				
yes: 16.0 %	no: 84.0 %			

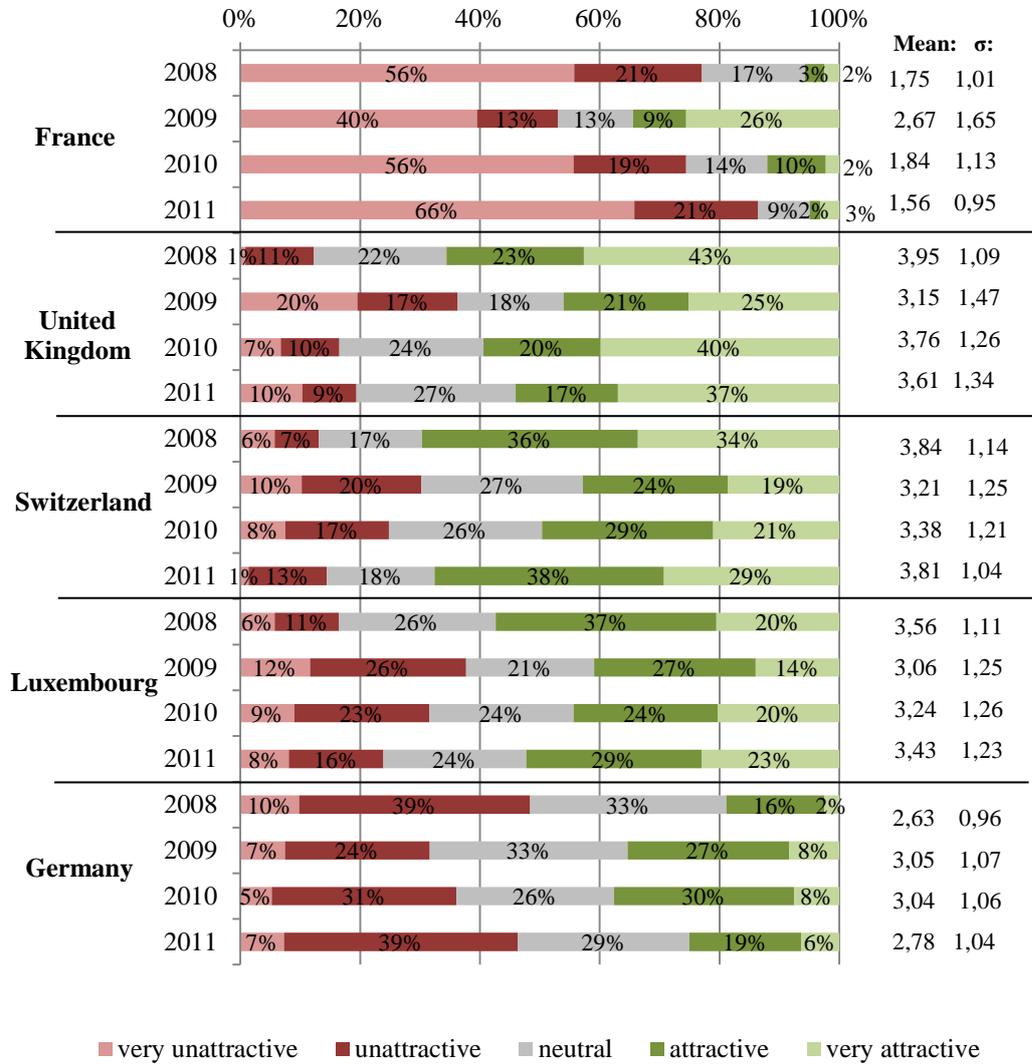
Source: Own calculations; \*The number of responses is compounded as follows: 126 in 2008, 228 in 2009, 135 in 2010 and 241 in 2011; \*\*Zip codes beginning with 60 are assigned to Frankfurt/Main.

**Figure 2: Attractiveness of Germany as a Financial Center**



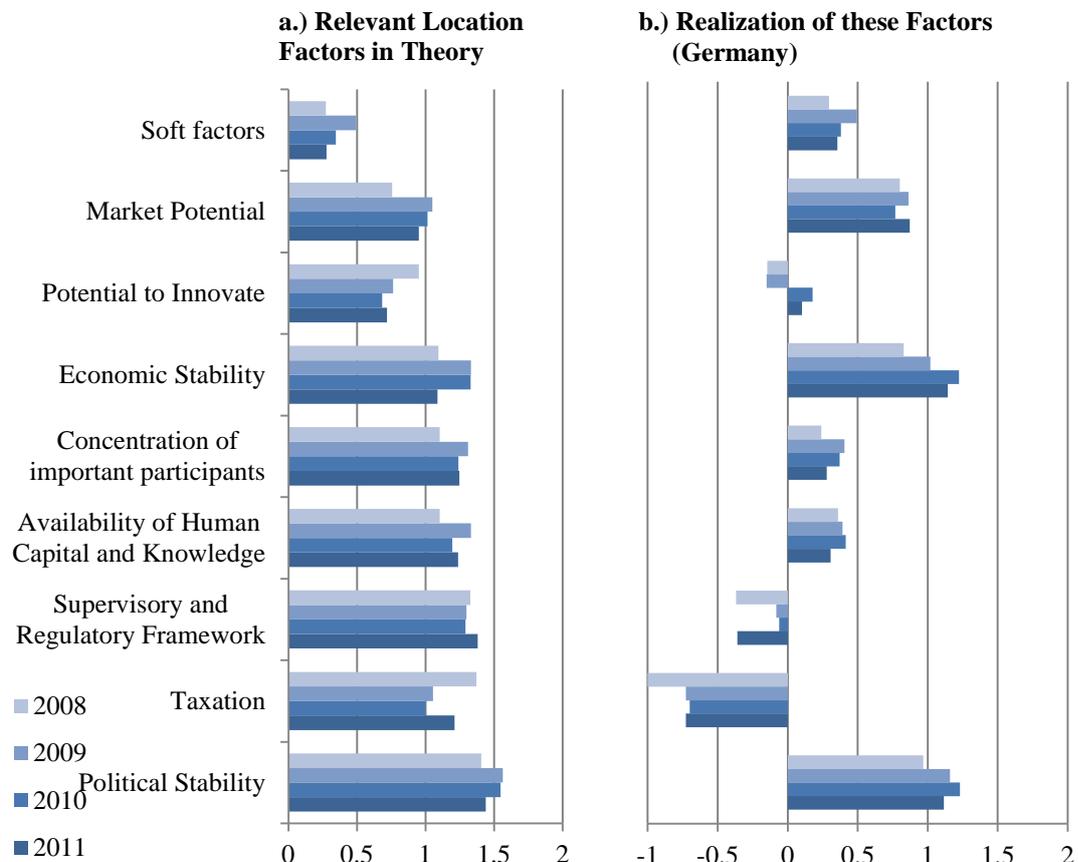
Source: Own calculations.

**Figure 3: General Rating of the European Financial Centers**



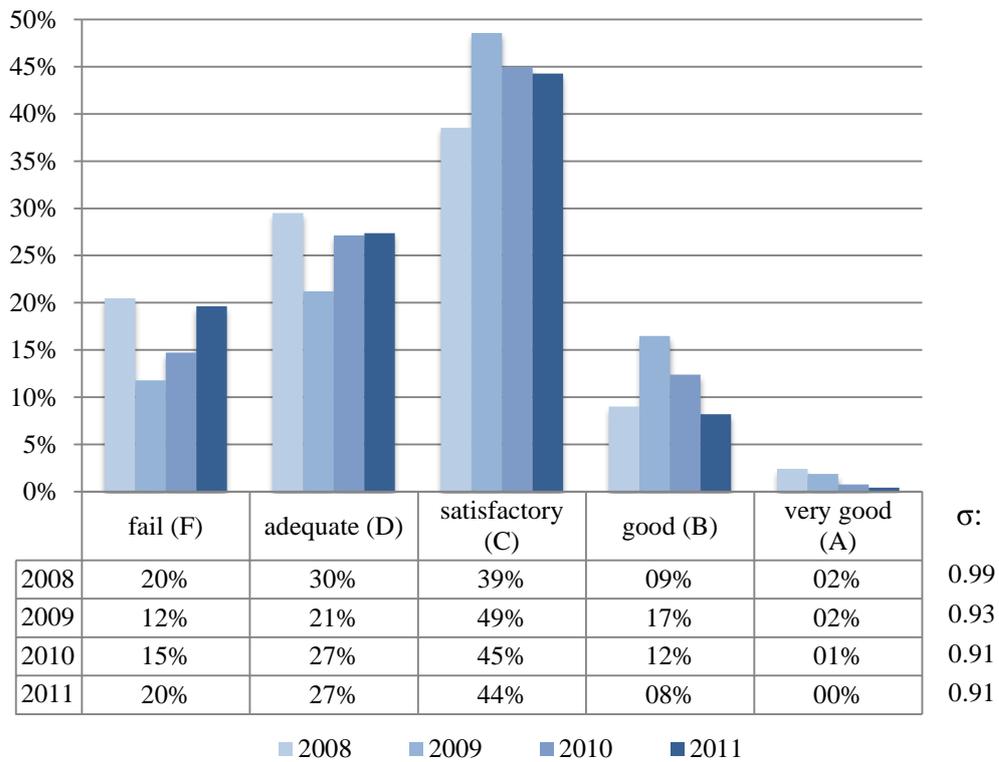
Source: Own calculations.

**Figure 4: Relevant Location Factors in Theory and Realization**



Source: Own calculations; the scales of assessment on (a) the left-hand side and (b) the right-hand side range from minus 2 (a= unimportant, b= much worse) to plus 2 (a= very important, b= much better). The factors are sorted by importance in 2008 and thus before the financial crisis.

**Figure 5: Assessment of Government Efforts to create Framework Conditions**



Source: Own calculations; rating scale corresponds to school grades from 1=A (very good) to 5=F (fail).

**Table 3: List of Independent Variables and Definitions**

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Variable	Description
<i>Assessments regarding the existing location factors (Likert scale 1-5):</i>	
MARKET	Market size
CONCENTRATION	Close proximity between financial market participants in a cluster
TAX	Tax attractiveness (company taxation, taxation of capital, taxation of highly qualified workers)
HUMANCAPITAL	Human capital and knowledge (qualified employees, proximity to universities)
REGULATION	Attractiveness of the regulatory and supervisory framework
STABPOL	Stability of the political system (legal security, stable political guidelines)
STABECON	Stability of the economy (prices, interest rate, exchange rates, economic development)
INNOVATION	Innovation potential (positioning in future-oriented fields)
SOFTFACTS	Soft factors (living quality, language, culture, spare time activities)
GOVC	Efforts of the government to establish favorable framework conditions
GOVY	Improvements by the government in the last two years
<i>Socio-economic background of the financial expert:</i>	
AGE	Age, in years
JOBEX	Duration of time working in business, in years
FINEX	Duration of time working in the field of finance, in years
UNI	Dummy variable for graduation from a university
FINCENTER	Dummy variable for locations of zip codes beginning with 60 are assigned to Frankfurt
BANK	Dummy variable for working in a bank (benchmark)
FUNDCOMPANY	Dummy variable for working in a fund company
INSURANCE	Dummy variable for working in an insurance company
CORPORATE	Dummy variable for working in a corporation (excl. banks, fund companies, and insurances)
<i>Time Dummies:</i>	
Year 2009	Dummy variable for the year 2009
Year 2010	Dummy variable for the year 2010
Year 2011	Dummy variable for the year 2011

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Source: Organized by the author.

**Table 4: Empirical Results with an Ordered Probit Model**

	(1)		(2)		(3)		(4)	
	coef	se	coef	se	coef	se	coef	se
MARKET			0.104 <sup>†</sup>	(0.066)			0.137**	(0.067)
CONCENTRATION			0.211***	(0.069)			0.224***	(0.070)
TAX			0.049	(0.073)			0.047	(0.074)
HUMANCAPITAL			-0.051	(0.068)			-0.055	(0.069)
REGULATION			0.101**	(0.056)			0.116**	(0.058)
STABPOL			0.089	(0.076)			0.109	(0.078)
STABECON			0.011	(0.084)			-0.035	(0.086)
INNOVATION			0.069	(0.066)			0.084	(0.067)
SOFTFACTS			0.091	(0.070)			0.111 <sup>†</sup>	(0.072)
GOVC			0.052*	(0.066)			0.061*	(0.067)
GOVY			0.325***	(0.083)			0.348***	(0.085)
AGE					-0.007	(0.006)	-0.002	(0.006)
FINEX					0.000	(0.000)	0.000	(0.000)
JOBEX					0.000	(0.000)	0.000	(0.000)
UNI					0.118	(0.118)	0.121	(0.121)
FINCENTER					0.155	(0.156)	0.161	(0.161)
FUNDCOMPANY					-0.675***	(0.194)	-0.877***	(0.201)
INSURANCE					0.036	(0.191)	-0.168	(0.201)
CORPORATE					-0.097	(0.203)	-0.240	(0.212)
Year 2009	0.239 <sup>†</sup>	(0.152)	0.139	(0.156)	0.267*	(0.153)	0.190 <sup>†</sup>	(0.157)
Year 2010	0.1	(0.164)	-0.035	(0.170)	0.094	(0.165)	-0.020	(0.172)
Year 2011	-0.331**	(0.154)	-0.405**	(0.161)	-0.323**	(0.155)	-0.38**	(0.163)
Number of observations	629		573		538		472	
Log-Likelihood	-748.23		-631.86		-626.51		-523.85	
Pseudo R2	0.010		0.087		0.023		0.118	
LR Test	LR(19)=111.60 [0.000]		LR(8)=26.61 [0.008]		LR(11)=95.02 [0.000]			

Source: Own calculation; P values in brackets; Standard errors (se) in parentheses; <sup>†</sup> Significance at the 15% level; \* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level. The LR test refers to the comparison with the most general model (4).

**Table 5: Marginal Effects**

	(1)	(2)	(3)	(4)	(5)
	dy/dx	dy/dx	dy/dx	dy/dx	dy/dx
MARKET	-0.0013914 <sup>†</sup> (.00094)	-0.0204265** (.00875)	-0.0399842** (.01701)	.0479244** (.02023)	.0138777** (.00606)
CONCENTRATION	-0.0018912 <sup>†</sup> (.00115)	-0.0277638*** (.00935)	-.0543466*** (.01807)	.0651389*** (.0213)	.0188626*** (.00662)
TAX	-0.000282 (.00063)	-0.000414 (.0092)	-0.0008103 (.01801)	.0009712 (.02159)	.0002812 (.00625)
HUMANCAPITAL	.0002837 (.00062)	.0041648 (.0089)	.0081524 (.01743)	-.0097713 (.02088)	-.0028295 (.00606)
REGULATION	-0.0010679 (.00075)	-.0156774** (.00757)	-.0306879** (.01464)	.036782*** (.01748)	.0106512** (.0052)
STABPOL	-0.0010579 (.00085)	-.0155308 <sup>†</sup> (.01003)	-.0304011 <sup>†</sup> (.01951)	.0364382 <sup>†</sup> (.02326)	.0105516 <sup>†</sup> (.0069)
STABECON	.0001941 (.00076)	.0028498 (.01106)	.0055785 (.02164)	-.0066862 (.02594)	-.0019362 (.00752)
INNOVATION	-0.0006989 (.00068)	-0.0102611 (.00857)	-.0200858 (.0167)	.0240745 (.01997)	.0069714 (.00586)
SOFTFACTS	-0.0008236 (.00078)	-0.0120914 (.00916)	-.0236684 (.01799)	.0283686 (.02152)	.0082148 (.00626)
GOVC	-0.0008764 (.00073)	-.0128659 <sup>†</sup> (.00867)	-.0251845 <sup>†</sup> (.0169)	.0301857 <sup>†</sup> (.02015)	.008741 <sup>†</sup> (.00597)
GOVY	-0.0029196* (.00169)	-.0428624*** (.01178)	-.0839017*** (.02252)	.1005631*** (.02639)	.0291206*** (.00842)
AGE	.0000273 (.00006)	.0004004 (.00082)	.0007838 (.00161)	-.0009395 (.00192)	-.000272 (.00056)
FINEX	-8.79e-08 (.00000)	-1.29e-06 (.00000)	-2.53e-06 (.00000)	3.03e-06 (.00000)	8.77e-07 (.00000)
JOBEX	1.35e-07 (.00000)	1.99e-06 (.00000)	3.89e-06 (.00001)	-4.66e-06 (.00001)	-1.35e-06 (.00000)
UNI	.0007771 (.00104)	.0116667 (.01481)	.0237341 (.03123)	-.0278088 (.03575)	-.0083691 (.01123)
FINCENTER	.0002287 (.00148)	.0033166 (.02113)	.0063629 (.03974)	-.0077149 (.04875)	-.0021932 (.01361)
FUNDCOMPANY	.0217293* (.0131)	.1666213*** (.05024)	.1134404*** (.01952)	-.259035*** (.05162)	-.042756*** (.00895)
INSURANCE	.0014271 (.00246)	.0192803 (.02918)	.0330454 (.04356)	-.0427184 (.06098)	-.0110344 (.01408)
CORPORATE	.0028864 (.00356)	.0361347 (.03508)	.0548865 (.04069)	-.0759839 (.06605)	-.0179237 (.01288)
Year 2009	-0.0018507 (.0015)	-.0284073 <sup>†</sup> (.01841)	-.0605892 <sup>†</sup> (.04212)	.068884 <sup>†</sup> (.04544)	.0219632 (.01618)
Year 2010	.0000363 (.00151)	.0005327 (.02215)	.00104 (.04312)	-.0012484 (.05184)	-.0003606 (.01494)
Year 2011	.0030533 (.00254)	.0406784* (.02424)	.0693592* (.03595)	-.0896474* (.04975)	-.0234435* (.01232)

Source: Own calculation; Standard errors in parentheses (se); <sup>†</sup> Significance at the 15% level, \* Significant at the 10% level, \*\* Significant at the 5% level, \*\*\* Significant at the 1% level.