Han, Martijn A.

Working Paper
Strategic delegation improves cartel stability

SFB 649 Discussion Paper, No. 2012-056

Provided in Cooperation with:
Collaborative Research Center 649: Economic Risk, Humboldt University Berlin

Suggested Citation: Han, Martijn A. (2012) : Strategic delegation improves cartel stability, SFB 649 Discussion Paper, No. 2012-056, SFB 649, Economic Risk, Berlin

This Version is available at:
http://hdl.handle.net/10419/79630

Terms of use:
Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.
Strategic Delegation Improves Cartel Stability

Martijn A. Han *

* Humboldt-Universität zu Berlin, Germany

This research was supported by the Deutsche Forschungsgemeinschaft through the SFB 649 "Economic Risk".

http://sfb649.wiwi.hu-berlin.de
ISSN 1860-5664

SFB 649, Humboldt-Universität zu Berlin
Spandauer Straße 1, D-10178 Berlin
Strategic Delegation Improves Cartel Stability*

Martijn A. Han†

October 2, 2012

Abstract

Fershtman and Judd (1987) and Sklivas (1987) show that strategic delegation reduces firm profits in the one-shot Cournot game. Allowing for infinitely repeated interaction, strategic delegation can increase firm profits as it improves cartel stability.

Keywords: strategic delegation, collusion, cartel stability

JEL codes: D43, L13, L20, L41

1 Introduction

The strategic delegation literature shows how firms’ profitability is reduced by delegating control to a manager being remunerated with a fraction of profit and sales (Fershtman and Judd, 1987; Sklivas, 1987—hereafter: FJS).¹ This paper extends FJS’s seminal model to an infinitely repeated setting, thus allowing firm owners as well as managers to collude. Strategic delegation can then increase firms’ profitability through improving cartel stability.²

Figure 1 illustrates this result graphically. Denoting π* as the standard Cournot profit and π_d* as the Cournot profit in the delegation equilibrium, Figure 1A depicts FJS’s finding that delegation reduces profits in the one-shot Cournot game, independent of discount factor

---

¹This paper is based on Chapter 4 of my PhD thesis Vertical Relations in Cartel Theory, written at the Amsterdam Center for Law & Economics (ACLE), University of Amsterdam. I am grateful for their support. I also thank Jeanine Miklos-Thal, Patrick Rey, Maarten Pieter Schinkel, Bert Schoonbeek, Randolph Sloof, Jan Tuinstra, and Jeroen van de Ven for constructive discussions and comments. This research is supported by the Deutsche Forschungsgemeinschaft via the Collaborative Research Center 649 “Economic Risk”.

†Institute for Microeconomic Theory, Humboldt-Universität zu Berlin. Spandauer Strasse 1, D-10178 Berlin, Germany. Email: martijn.alexander.han@hu-berlin.de.

¹This result holds for FJS’s most elaborate case of Cournot competition.

²Relatedly, Lambertini and Trombetta (2002) extend Vickers’ (1985) model—which can be rewritten in terms of FJS’s model—and derive different results by implicitly assuming that firm owners do not react rationally on a managerial defection. Han (2011) comments on their analysis by considering rational players.
However, allowing for infinitely repeated interaction, Figure 1B illustrates that delegation increases the set of discount factors for which firms can collude on the monopoly profit $\pi^m$ from $[\delta^*, 1]$ to $[\delta_d^*, 1]$, thus increasing profits over the range $[\delta_d^*, \delta^*]$.

The intuition is two-fold. First, a manager defecting from collusion can be fiercely punished by the owners as they can stop delegating control (and potentially fire the manager); this reduces the managers’ incentive to defect. Second, the possibility of delegating control to managers allows collusion between owners on the product market to be supported by reverting to FJS’s unprofitable delegation equilibrium; an owner defecting from collusion faces punishment profit $\pi^*_d < \pi^*$, which reduces the owners’ incentive to defect.

The formal part of this paper is structured as follows. Section 2 presents the model and derives useful benchmarks. Section 3 characterizes the collusive delegation equilibrium (3.1), studies product market collusion by owners without delegation in equilibrium (3.2), and allows managers to be fired (3.3). Section 4 concludes.

2 The Infinitely Repeated Strategic Delegation Model

Consider FJS’s delegation game as the stage game. Two homogenous firms $i \in \{1, 2\}$ produce at unit cost $c \geq 0$ and compete in quantities, facing linear demand

$$p = a - bQ, \quad b > 0, a > c,$$

where $p$ is market price, $Q = q_1 + q_2$ is total output, and $q_i$ is output of firm $i$. Each firm $i$ is owned by profit-maximizing owner $i$ (female) who may delegate control to manager $i$ (male)
by remunerating him with a fraction \( \alpha_i \) of profit \( \pi_i \), plus a fraction \( 1 - \alpha_i \) of sales \( S_i \), that is,

\[
M_i = \alpha_i \pi_i + (1 - \alpha_i) S_i,
\]

which can be rewritten as \( M_i = (p - \alpha_i c) q_i \) by using (1). The managerial outside option is normalized to zero.\(^3\) The timing of the stage game is:

1. Both owners simultaneously decide whether to delegate or to keep control.
2. If owner \( i \) delegates, she sets incentives \( \alpha_i \) simultaneously with her rival.
3. The players in control of the firms simultaneously set quantities on the market.

**Repeated Interaction.** The stage game is played in each period \( t \in \{1, \ldots, \infty\} \), allowing for collusion on three dimensions: the delegation decision, incentives \( \alpha_i \), and quantities \( q_i \).

Owners and managers maximize their discounted stream of payoffs using discount factor \( \delta_{\text{own}} \) and \( \delta_{\text{man}} \), respectively. To keep the analysis clean and to stay in line with the literature, collusion is on the monopoly quantity and punishment on the product market is characterized by reversion to the static Nash equilibrium forever. Everything is common knowledge and fully observable to all players. I focus on symmetric equilibria and denote \( i \)’s rival by \( j \).

Superscripts \( \{*, m, D\} \) denote the Nash, collusive (monopoly), and deviating variables, respectively. Subscript \( d \) indicates that control of firm \( i \) is delegated to manager \( i \). Collusion by player \( x \in \{\text{owner } i, \text{manager } i\} \) is stable if and only if discount factor \( \delta_x \) satisfies

\[
\delta_x \geq \frac{[\text{defection payoff of player } x] - [\text{collusive payoff of player } x]}{[\text{defection payoff of player } x] - [\text{punishment payoff of player } x]}, \quad \forall i \in \{1, 2\}. \tag{2}
\]

**Benchmarks.** Consider the following benchmarks, which are formally derived in Appendix A. In FJS’s one-shot Cournot delegation game, owners are captured in a prisoner’s dilemma and cannot avoid delegation, resulting in equilibrium incentives, quantities, and payoffs

\[
\alpha_{di}^* = \frac{6}{5} - \frac{a}{5c}, \quad q_{di}^* = \frac{2(a - c)}{5b}, \quad M_{di}^* = \frac{4(a - c)^2}{25b}, \quad \pi_{di}^* = \frac{2(a - c)^2}{25b}, \tag{3}
\]

\(^3\)In their original framework, FJS consider rewards \( A_i + B_i M_i \). Since the managerial outside option is normalized to zero, owners optimally set \( A_i = 0 \) and \( B_i \) arbitrarily small, say \( B_i = \epsilon_i > 0 \). With delegation, owner \( i \) then earns \( \pi_i - \epsilon_i M_i \) and manager \( i \) earns \( \epsilon_i M_i \). In the limit when \( \epsilon_i \downarrow 0 \), (i) term \( \epsilon_i M_i \) has an infinitesimally small impact on owner \( i \)’s payoff and, therefore, she essentially behaves so as to maximize profit \( \pi_i \), whereas (ii) manager \( i \)’s payoff only consists of \( \epsilon_i M_i \) and, therefore, she maximizes \( M_i \).
which entails a lower profit than if owners would have been able to escape delegation and play the standard Cournot game,

\[ q_i^* = \frac{a - c}{3b}, \pi_i^* = \frac{(a - c)^2}{9b}. \]  

(4)

In the infinitely repeated standard Cournot game, collusion is stable if and only if

\[ \delta_{own} \geq \frac{\pi_i^D - \pi_i^m}{\pi_i^D - \pi_i^*} = \frac{9}{17}, \text{ with} \]

\[ q_i^m = \frac{a - c}{4b}, \pi_i^m = \frac{(a - c)^2}{8b}. \]  

(5)

3 Delegation and Collusion

This section derives the collusive delegation equilibrium when managers cannot be fired (3.1), how the very possibility of delegation improves collusion on the product market between owners (3.2), and the collusive delegation equilibrium when managers can be fired (3.3).

3.1 The Collusive Delegation Equilibrium

The collusive delegation equilibrium yielding monopoly profits entails owners delegating control and colluding by giving no incentives for sales, thereby “selling the store” to managers who collude on the product market. Appendix B formally derives that

\[ \alpha_{di}^m = 1, q_{di}^m = \frac{a - c}{4b}, M_{di}^m = \frac{(a - c)^2}{8b}, \pi_{di}^m = \frac{(a - c)^2}{8b}, \]  

(6)

which is stable if and only if owners as well as managers have no incentive to defect.

**Owner’s defection.** Owners can defect in two ways: they can (i) defect in stage 2 by setting incentives different from \( \alpha_{di}^m \), or (ii) defect in stage 1 by not delegating at all.

If owner \( i \) defects by setting different incentives, then managers optimally react with Nash competition in stage 3 so as to punish the deviant owner. Conditional on owner \( i \) defecting to incentives \( \alpha_i \), Nash quantities in stage 3 are

\[ q_i(\alpha_i) = \frac{a + (1 - 2\alpha_i)c}{3} \quad \text{and} \quad q_j(\alpha_i) = \frac{a + (\alpha_i - 2)c}{3}, \]

yielding

\[ \pi_i(\alpha_i) = \left( a - b \left( \frac{a + (1 - 2\alpha_i)c}{3} + \frac{a + (\alpha_i - 2)c}{3} \right) - c \right) \frac{a + (1 - 2\alpha_i)c}{3}. \]
which is maximized at \( i = \frac{5}{4} - \frac{a}{4c} \) with \( \pi_i = \frac{(a-c)^2}{8b} \). As defection profit equals collusive profit, while triggering future punishment, owners would never make such a defection.

If instead owner \( i \) defects by not delegating at all, this triggers Nash competition with her rival’s manager \( j \) in stage 3. Owner \( i \) and manager \( j \) respectively maximize \( \pi_i (q_i, q_j) = (a - b (q_i + q_j) - c) q_i \) and \( M_j (q_i, q_j) = (a - b (q_i + q_j) - c) q_j \), resulting in profit \( \pi_i = \frac{(a-c)^2}{9b} \), which is lower than the collusive profit. Therefore, owners do not defect from the delegation decision. Lemma 1 summarizes.

**Lemma 1** Independent of the discount factor \( \delta_{own} \), owners do not defect from collusion.

**Managerial defection.** If manager \( i \) defects from the collusive quantity \( q_{mi} = \frac{a-c}{4b} \), she does so by maximizing

\[
M_i (q_i) = \left( a - b \left( q_i - \frac{a-c}{4b} \right) - c \right) q_i,
\]

yielding deviant quantity \( q_i = \frac{3(a-c)}{8b} \) with payoff \( M_i = \frac{9(a-c)^2}{64b} \). To optimally prevent such a managerial defection, owners will want to avoid delegating control to managers in future periods, thereby fiercely punishing the manager with a zero payoff.\(^4\) Using condition (2), i.e., \( \delta_{man} \geq \left( \frac{9(a-c)^2}{64b} - \pi_{mi} \right) / \left( \frac{9(a-c)^2}{64b} - 0 \right) \), Lemma 2 states the resulting stability condition.

**Lemma 2** Managers do not defect from collusion if and only if \( \delta_{man} \geq \frac{1}{9} \).

**Owner’s commitment to avoid delegation.** Whether owners are indeed able to punish managers by avoiding delegation depends on the owners’ patience \( \delta_{own} \). Appendix D shows that the owners’ commitment to not delegate suffers from FJS’s prisoners dilemma when owners compete on quantities while keeping control, but it is no concern when owners collude on quantities while keeping control.

When owners punish a deviant manager by keeping control and colluding on quantities themselves, equilibrium profit during punishment is \( \pi_{mi} = \frac{(a-c)^2}{8b} \), while defection results in profit \( \pi_i^D = \frac{9(a-c)^2}{64b} \), but triggers FJS’s one-shot delegation equilibrium with profit \( \pi_{di}^* = \frac{2(a-c)^2}{25b} \). Using condition (2), i.e., \( \delta_{own} \geq \left( \pi_i^D - \pi_{mi} \right) / \left( \pi_i^D - \pi_{di}^* \right) \), we arrive at Lemma 3.

**Lemma 3** After a manager defected, owners can commit to avoid delegation iff. \( \delta_o \geq \frac{25}{97} \).

As one can argue that discount factors are determined on financial markets, rational owners and managers with access to such markets can be assumed to be equally patient, i.e., \( \delta_{own} = \delta_{man} = \delta \). Combining Lemmas 1, 2, and 3, gives the following proposition.

\(^4\)Appendix C checks that such punishment is indeed optimal, taking into account the owners’ ability to commit to such punishment, and comparing the stability conditions with those in Lemmas 2 and 3.
Proposition 1: Collusion is more stable in the infinitely repeated Cournot delegation model ($\delta \geq \delta^* = \frac{25}{97}$) than in the infinitely repeated standard Cournot model ($\delta \geq \delta^* = \frac{9}{17}$).

Comparing profits in the infinitely repeated version of FJS’s Cournot delegation model with those in the infinitely repeated standard Cournot model yields a lower equilibrium profit $\frac{2(a-c)^2}{25b} < \frac{(a-c)^2}{9b}$ for low discount factors $\delta < \frac{25}{97}$, but a higher equilibrium profit $\frac{(a-c)^2}{8b} > \frac{(a-c)^2}{9b}$ for intermediate discount factors $\frac{25}{97} \leq \delta < \frac{9}{17}$, and the same equilibrium profit $\frac{(a-c)^2}{8b}$ for high discount factors $\delta \geq \frac{9}{17}$. Figure 1B illustrates graphically and Proposition 2 summarizes.

Proposition 2: In an infinitely repeated setting, FJS’s static key result that delegation reduces firms’ profitability does not hold for high discount factors, is reversed for intermediate discount factors, and survives for low discount factors.

3.2 Product Market Collusion by Owners Without Delegation

Owners may choose not to delegate at all and collude on the product market themselves. As Lemma 3 indicates, owners can commit not to delegate and collude on quantities if and only if $\delta \geq \frac{25}{97}$. Hence, even without delegation in equilibrium, the very possibility of delegation improves the stability of collusion between owners.

3.3 Firing Managers

When managers can be fired, the collusive delegation equilibrium derived in (6) can be supported by firing the deviant manager, while hiring a new manager who continues to collude. Then, the owner’s punishment strategy of no delegation becomes irrelevant and the only relevant constraint is that managers do not defect from collusion, i.e., $\delta_d^* \geq \frac{3}{2}$ by Lemma 2. Hence, firing managers makes the collusive delegation equilibrium even more stable.

4 Conclusion

Strategic delegation improves cartel stability. The intuition is that managers face a zero payoff after defection as owners will punish them by not delegating control anymore. Owners can commit to such punishment for a large set of discount factors, because an owner’s defection from this punishment strategy results in FJS’s unprofitable one-shot delegation equilibrium.
References


Appendix

A Benchmarks

Outcome (4) is straightforwardly obtained as the static Nash equilibrium when both owners independently maximize \( \pi_i = (p - c) q_i \), while outcome (5) is obtained when owners jointly maximize \( \sum_{i=1}^{2} \pi_i \). When owner \( j \) produces \( q_j^m = \frac{a-c}{4b} \), owner \( i \)'s optimal defection quantity is \( q_i^D = \arg \max_{q_i} \{ (a - b (q_i + q_j^m) - c) q_i \} = \frac{3(a-c)}{8b} \), leading to profit \( \pi_i^D = \frac{9(a-c)^2}{64b} \). Thus, collusion is stable if and only if

\[
\delta_o \geq \frac{\pi_i^D - \pi_i^m}{\pi_i^D - \pi_i^*} = \frac{9}{17}.
\]

Consider FJS’s one-shot Cournot delegation game. In stage 3, both managers independently maximize \( M_i = (p - \alpha_i c) q_i \), leading to quantities as a function of incentives

\[
q_i (\alpha_i, \alpha_j) = \frac{a - 2\alpha_i c + \alpha_j c}{3b}.
\] (7)

In stage 2, both owners substitute these into \( \pi_i = (a - b (q_i + q_j) - c) q_i \) to independently maximize profit, yielding outcome (3), provided that both owners indeed delegate in stage 1.

If both owners keep control, they each earn the Cournot Nash profit \( \pi_i^* = \frac{(a-c)^2}{9b} \). If owner \( i \) delegates, while owner \( j \) keeps control, then quantities as a function of incentives \( \alpha_i \) become \( q_i (\alpha_i, 1) \) and \( q_j (1, \alpha_i) \) by (7). In stage 2, owner \( i \) then maximizes \( \pi_i (\alpha_i) = (a - b (q_i (\alpha_i, 1) + q_j (1, \alpha_i)) - c) q_i (\alpha_i, 1) \), yielding \( \alpha_i = \frac{5c-a}{4c} \) and

\[
\pi_i = \frac{(a-c)^2}{8b}, \quad \pi_j = \frac{(a-c)^2}{16b}.
\] (8)

Since owner \( i \) is better off by delegating if her rival keeps control, while owner \( j \) is worse off if she keeps control and her rival delegates compared to when both owners delegate, owners indeed delegate in stage 1.

B Equilibrium Incentives With Delegation

In stage 3, managers jointly maximize \( \sum_{i=1}^{2} M_i \), yielding \( q_1 + q_2 = \frac{a-\alpha_1 c}{2b} = \frac{a-\alpha_2 c}{2b} \). Focusing on symmetric equilibria, both managers set the same quantity as a function of incentives, \( q_1 = q_2 = \frac{a-\alpha_1 c}{2b} = \frac{a-\alpha_2 c}{2b} \), which holds for symmetric incentives \( \alpha_1 = \alpha_2 = \alpha \), resulting in \( q_1 = q_2 = \frac{a-\alpha c}{2b} \). Substituting these in the owners’ profit functions gives \( \pi_i (\alpha) = \frac{[a-(2-\alpha)c](a-\alpha c)}{8b} \), which is maximized at \( \alpha_i^m = \alpha_j^m = \alpha = 1 \) in stage 2, resulting in outcome (6).
C Optimality of “Not Delegating Control” As the Punishment Strategy

This appendix shows that not delegating control is indeed the best strategy for owners to punish a deviant manager. First, suppose owners instead punish by reverting to “delegation and compete in setting incentives.” We then get FJS’s static delegation outcome (3) with managerial payoff \( M_{di}^* = \frac{4(a-c)^2}{25b} \), which is actually higher than managerial payoff in the collusive delegation equilibrium \( M_{di}^{cn} = \frac{(a-c)^2}{8b} \), thereby making collusion fully unstable.

Second, suppose owners punish by reverting to “delegation and collude in setting incentives.” In stage 3, managers set quantities as outlined in (7). In stage 2, owners substitute these into their joint profit function \( \sum_{i=1}^{2} \pi_i \), which is maximized with symmetric incentives \( \alpha_i = \frac{3}{4} + \frac{a}{4c} \), yielding \( \pi_i = \frac{(a-c)^2}{8b} \) and \( M_i = \frac{(a-c)^2}{18b} \). If owner \( i \) deviates by setting different incentives, straightforward algebra leads to the optimal deviating incentive being \( \alpha_i = \frac{21}{16} - \frac{5a}{16c} \) with profit \( \pi_i = \frac{25(a-c)^2}{128b} \). This triggers punishment by FJS’s static Nash equilibrium with \( \pi_{di}^* = \frac{2(a-c)^2}{25b} \). Thus, owners can commit to punishment iff \( \delta_{own} \geq \frac{25(a-c)^2}{128b} \cdot \frac{(a-c)^2}{8b} = \frac{25}{41} \), and managers do not defect in the first place iff \( \delta_{man} \geq \frac{9(a-c)^2}{64b} \cdot \frac{(a-c)^2}{8b} = \frac{9}{49} \). These stability conditions are more difficult to satisfy than \( \delta_{own} \geq \frac{25}{41}, \delta_{man} \geq \frac{1}{9} \) from Lemmas 2 and 3.

D Owner’s Commitment to Avoid Delegation

Suppose owners punish a deviant manager by keeping control, while *competing on the product market*. Owner \( i \) then earns \( \pi_i^* = \frac{(a-c)^2}{9b} \). If she defects from the punishment scheme by delegating control, then in stage 3 manager \( i \) and owner \( j \) compete with respective payoffs \( M_i (q_i, q_j) = (a-b(q_i + q_j) - \alpha_i c) q_i \) and \( \pi_j (q_i, q_j) = (a-b(q_i + q_j) - c) q_j \), yielding quantities \( q_i (\alpha_i) = \frac{a+(1-2\alpha_i)c}{3}, q_j (\alpha_i) = \frac{a+(\alpha_i-2)c}{3} \) and profit

\[
\pi_i (\alpha_i) = \left( a - b \left( \frac{a + (1 - 2\alpha_i) c}{3} + \frac{a + (\alpha_i - 2) c}{3} \right) - c \right) \frac{a + (1 - 2\alpha_i) c}{3},
\]

which owner \( i \) maximizes at \( \pi_i = \frac{(a-c)^2}{8b} \) with \( \alpha_i = \frac{5}{4} - \frac{a}{4c} \). Since defection triggers punishment by FJS’s one-shot delegation Nash equilibrium with profit \( \pi_{di}^* = \frac{2(a-c)^2}{25b} \) (see equations (3)), owners can commit to punishment if and only if \( \delta_{own} \geq \frac{(a-c)^2}{8b} \cdot \frac{2(a-c)^2}{25b} = \frac{25}{81} \).

Now suppose owners punish a deviant manager by keeping control, while *colluding on the product market*. Owner \( i \) then earns \( \pi_i^{cn} = \frac{(a-c)^2}{8b} \), while defection from the punishment scheme by delegating control results in competition between manager \( i \) and owner \( j \) with defection profit \( \pi_i = \frac{(a-c)^2}{8b} \) (see equations (8)). Since defection profit equals collusive profit, owners will not defect from punishment through delegation.
SFB 649 Discussion Paper Series 2012

For a complete list of Discussion Papers published by the SFB 649, please visit http://sfb649.wiwi.hu-berlin.de.

001 "HMM in dynamic HAC models" by Wolfgang Karl Härdle, Ostap Okhrin and Weining Wang, January 2012.
002 "Dynamic Activity Analysis Model Based Win-Win Development Forecasting Under the Environmental Regulation in China" by Shiyi Chen and Wolfgang Karl Härdle, January 2012.
003 "A Donsker Theorem for Lévy Measures" by Richard Nickl and Markus Reiß, January 2012.
004 "Computational Statistics (Journal)" by Wolfgang Karl Härdle, Yuichi Mori and Jürgen Symanzik, January 2012.
005 "Implementing quotas in university admissions: An experimental analysis" by Sebastian Braun, Nadja Dwenger, Dorothea Kübler and Alexander Westkamp, January 2012.
006 "Quantile Regression in Risk Calibration" by Shih-Kang Chao, Wolfgang Karl Härdle and Weining Wang, January 2012.
007 "Total Work and Gender: Facts and Possible Explanations" by Michael Burda, Daniel S. Hamermesh and Philippe Weil, February 2012.
008 "Does Basel II Pillar 3 Risk Exposure Data help to Identify Risky Banks?" by Ralf Sabiwalsky, February 2012.
009 "Comparability Effects of Mandatory IFRS Adoption" by Stefano Cascino and Joachim Gassen, February 2012.
010 "Fair Value Reclassifications of Financial Assets during the Financial Crisis" by Jannis Bischof, Ulf Brüggemann and Holger Daske, February 2012.
011 "Intended and unintended consequences of mandatory IFRS adoption: A review of extant evidence and suggestions for future research" by Ulf Brüggemann, Jörg-Markus Hitz and Thorsten Sellhorn, February 2012.
012 "Confidence sets in nonparametric calibration of exponential Lévy models" by Jakob Söhl, February 2012.
013 "The Polarization of Employment in German Local Labor Markets" by Charlotte Senftleben and Hanna Wielandt, February 2012.
014 "On the Dark Side of the Market: Identifying and Analyzing Hidden Order Placements" by Nikolaus Hautsch and Ruihong Huang, February 2012.
015 "Existence and Uniqueness of Perturbation Solutions to DSGE Models" by Hong Lan and Alexander Meyer-Gohde, February 2012.
016 "Nonparametric adaptive estimation of linear functionals for low frequency observed Lévy processes" by Johanna Kappus, February 2012.
017 "Option calibration of exponential Lévy models: Implementation and empirical results" by Jakob Söhl und Mathias Trabs, February 2012.
018 "Managerial Overconfidence and Corporate Risk Management" by Tim R. Adam, Chitru S. Fernando and Evgenia Golubeva, February 2012.
019 "Why Do Firms Engage in Selective Hedging?" by Tim R. Adam, Chitru S. Fernando and Jesus M. Salas, February 2012.
020 "A Slab in the Face: Building Quality and Neighborhood Effects" by Rainer Schulz and Martin Wersing, February 2012.
021 "A Strategy Perspective on the Performance Relevance of the CFO" by Andreas Venus and Andreas Engelen, February 2012.
022 "Assessing the Anchoring of Inflation Expectations" by Till Strohsal and Lars Winkelmann, February 2012.
SFB 649 Discussion Paper Series 2012

For a complete list of Discussion Papers published by the SFB 649, please visit http://sfb649.wiwi.hu-berlin.de.


024 "Bye Bye, G.I. - The Impact of the U.S. Military Drawdown on Local German Labor Markets" by Jan Peter aus dem Moore and Alexandra Spitz-Oener, March 2012.

025 "Is socially responsible investing just screening? Evidence from mutual funds" by Markus Hirschberger, Ralph E. Steuer, Sebastian Utz and Maximilian Wimmer, March 2012.

026 "Explaining regional unemployment differences in Germany: a spatial panel data analysis" by Franziska Lottmann, March 2012.

027 "Forecast based Pricing of Weather Derivatives" by Wolfgang Karl Härdle, Brenda López-Cabrera and Matthias Ritter, March 2012.


029 “Statistical Modelling of Temperature Risk” by Zografia Anastasiadou, and Brenda López-Cabrera, April 2012.

030 “Support Vector Machines with Evolutionary Feature Selection for Default Prediction” by Wolfgang Karl Härdle, Dedy Dwi Prastyo and Christian Hafner, April 2012.

031 “Local Adaptive Multiplicative Error Models for High-Frequency Forecasts” by Wolfgang Karl Härdle, Nikolaus Hautsch and Andrija Mihoci, April 2012.

032 “Copula Dynamics in CDOs.” by Barbara Choroś-Tomczyk, Wolfgang Karl Härdle and Ludger Overbeck, May 2012.

033 “Simultaneous Statistical Inference in Dynamic Factor Models” by Thorsten Dickhaus, May 2012.


040 “Location, location, location: Extracting location value from house prices” by Jens Kolbe, Rainer Schulz, Martin Wersing and Axel Werwatz, May 2012.

041 “Multiple point hypothesis test problems and effective numbers of tests” by Thorsten Dickhaus and Jens Stange, June 2012.

042 “Generated Covariates in Nonparametric Estimation: A Short Review.” by Enno Mammen, Christoph Rothe, and Melanie Schienle, June 2012.


044 “Copula-Based Dynamic Conditional Correlation Multiplicative Error Processes” by Taras Bodnar and Nikolaus Hautsch, July 2012.
SFB 649 Discussion Paper Series 2012

For a complete list of Discussion Papers published by the SFB 649, please visit http://sfb649.wiwi.hu-berlin.de.

046 "A uniform central limit theorem and efficiency for deconvolution estimators" by Jakob Söhl and Mathias Trabs, July 2012
047 "Nonparametric Kernel Density Estimation Near the Boundary" by Peter Malec and Melanie Schienle, August 2012
048 "Yield Curve Modeling and Forecasting using Semiparametric Factor Dynamics" by Wolfgang Karl Härdle and Piotr Majer, August 2012
049 "Simultaneous test procedures in terms of p-value copulae" by Thorsten Dickhaus and Jakob Gierl, August 2012
050 "Do Natural Resource Sectors Rely Less on External Finance than Manufacturing Sectors? " by Christian Hattendorff, August 2012
051 "Using transfer entropy to measure information flows between financial markets" by Thomas Dimpfl and Franziska J. Peter, August 2012
052 "Rethinking stock market integration: Globalization, valuation and convergence" by Pui Sun Tam and Pui I Tam, August 2012
053 "Financial Network Systemic Risk Contributions" by Nikolaus Hautsch, Julia Schaumburg and Melanie Schienle, August 2012
054 "Modeling Time-Varying Dependencies between Positive-Valued High-Frequency Time Series" by Nikolaus Hautsch, Ostap Okhrin and Alexander Ristig, September 2012
055 "Consumer Standards as a Strategic Device to Mitigate Ratchet Effects in Dynamic Regulation" by Raffaele Fiocco and Roland Strausz, September 2012
056 "Strategic Delegation Improves Cartel Stability" by Martijn A. Han, October 2012