The impact of competition vs. cooperation between subsidiaries within a multinational corporation

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Abstract

This research seeks to determine the impact of headquarter control, rent-seeking behaviour, inter-subsidiary cooperation and competition on multination corporation (MNC) business performance. The research presents a framework for MNCs to structure its headquarter-subsidiary and subsidiary-subsidiary relationships to best support its global profit and shareholder value maximisation goal.

The study used a quantitative research design to survey all MNCs operating within South Africa with headquarters in Europe, Japan or the United States of America. A survey (on-line questionnaire) measured the perceived level of subsidiary autonomy (headquarter control), rent-seeking behaviour, inter-subsidiary cooperation, inter-subsidiary competition and MNC performance (increase in domestic market share) within each subsidiary. An objective measure of MNC performance (global return on shareholder funds) was also included to confirm the validity of the research findings. The study used a multiple linear regression model to analyse the data.

The research study found that a business strategy that promotes high levels of both inter-subsidiary cooperation and competition will maximise business performance. The study also confirmed that headquarter control constrains rent-seeking behaviour, whilst rent-seeking behaviour will harm MNC performance. The study, however, found that high levels of headquarter control has a net negative impact on global MNC performance.

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Francois Retief

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Signature Date

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I would like to thank the following individuals who contributed to this research project and who supported me through the last two years:

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1 Introduction

1.1 Background

Multinational Corporations (MNCs) today face a more challenging business environment with increased pressures and competition (Diefenbach, 2006). These escalating risks are associated with increased global competition (Ma, Lee and Chen, 2009) and exchange rate volatility (Kotabe and Murray, 2004). This has led to increased difficulty in managing globally scattered operations. Within this challenging business environment it "is not a choice, but an unavoidable necessity" (Diefenbach, 2006, p.129) for MNCs to follow a business strategy that best supports their shareholders' wealth maximisation goal.

According to Enright and Subramanian (2007, p.896), "one of the crucial questions in international business research is how the multinational enterprise organises and manages its international operations." A strategy that combines the benefits of global integration and regional flexibility will allow an MNC to "maximise consolidated economic returns contributed by globally scattered subunits" (Luo, 2005, p.71). According to Luo (2005) there are two main sets of strategic links within an MNC that supports effective global integration and regional flexibility:

- The first is between headquarters and subsidiaries and
- The second is between subsidiaries within the MNC.

These strategic links act as drivers for strategy implementation across the MNC. They also determine the framework within which the subsidiaries operate and therefore also have a major impact on overall MNC performance. Another item worth mentioning is the informal strategic counteractions from subsidiaries to maximise their own budget and resource allocation. These actions are often a direct result of allowing greater subsidiary autonomy to improve market flexibility (Mudambi and Navarra, 2004) and are therefore a direct response to the structure of the global strategic framework. This self-seeking behaviour from subsidiary managers, referred to as rent-seeking behaviour, erodes the MNC's performance and can occur in both the headquarter-subsidiary and subsidiary-subsidiary relationships (Mudambi *et al.*, 2004).

1.2 Headquarter-Subsidiary Relationship

Various recent studies focussed on the relationship between the MNC headquarters and its subsidiaries (Andersson, Forsgren, and Holm, 2007; Bouquet and Birkinshaw, 2008; Cruz and Pedrozo, 2009). The structure of this relationship between the headquarters and its subsidiaries, however, requires further analysis (Birkinshaw, Holm, Thilenius and Arvidsson, 2000). Especially since this structure may differ across regions and national boundaries. The structure of this relationship is mainly determined by the level of autonomy the MNC headquarters provides to the subsidiary.

Multinational firms would ideally like to ensure coherent strategy implementation across all their subsidiaries, which requires a certain level of headquarter control, whilst still providing each with a level of autonomy which allows for local market flexibility (Luo, 2003; Luo, 2005; Festing, Eidems and Royer, 2007; Fisher and Bonn, 2007). Therefore, the level of headquarter control (or subsidiary autonomy) is a crucial part of MNC business strategy which should have a considerable impact on MNC performance. The first objective of the study is therefore to determine the ideal level of headquarter control and/or subsidiary autonomy that will maximise MNC performance within South Africa.

1.3 Subsidiary-Subsidiary Relationship

Relationships between the various national subsidiaries within the MNC form the second set of relationships. Few of the available research papers focus on inter-subsidiary relationships (Luo, 2005). Most researchers have rather focussed on parent-subsidiary (Luo, 2003) and cross-departmental relationships (Luo, Slotegraaf and Pan, 2006). Subsidiary management, however, forms an important part of any MNC's business strategy (Haugland, 2009), since an MNC's headquarters is dependent on its subsidiaries to seize local market opportunities (Luo, 2003). An MNC's business strategy therefore needs to establish a framework that addresses the needs of its subsidiaries to create an environment that will maximise shareholder returns.

MNCs can promote a business strategy that encourages either competition, cooperation or a combination of cooperation and competition between their subsidiaries (Luo, 2005; Wu and Choi, 2005; Ross and Robertson, 2007). It is, however, unclear which inter-subsidiary business strategy will deliver the best financial results in a country like South Africa which operates on the periphery of the global economy. Previous studies on the subject (Luo *et al.*, 2006; Ross *et al.*, 2007) focussed on subsidiaries which operate within the Triad of the global economy (in other words, the United States, Western Europe and Japan). Subsidiaries operating on the Triad of the global economy receive proportionally higher levels of foreign direct investment (FDI) and research and development investment from their parent company than subsidiaries within developing countries or subsidiaries operating on the periphery of the global economy (Narula and Sadowski, 2002; Benito and Narula, 2007).

Research focussed on a country operating on the periphery of the global economy (like South Africa) may therefore provide fresh insight into this subject matter. The second objective of the study is therefore to determine the ideal level of inter-subsidiary cooperation and competition that a MNC should promote through its business strategy to maximise MNC performance.

1.4 Strategic Counteractions

As mentioned in Section 1.1, rent-seeking behaviour from subsidiary managers forms as a result of the structure and intensity of the headquarter-subsidiary and subsidiary-subsidiary relationships (Mudambi *et al.*, 2004). To ensure optimised inter-subsidiary resources allocation, companies should avoid rent-seeking behaviour from subsidiaries (Scharfstein and Stein, 2000). Rent-seeking behaviour limits resource allocation to better performing subsidiaries, able to achieve higher returns and profits.

One therefore cannot exclude rent-seeking behaviour when studying MNC headquarter-subsidiary and subsidiary-subsidiary relationships as it forms an integral part of these inter-relationships and also impacts on company performance. The third objective of the study is therefore to study the impact of rent-seeking behaviour on the inter-relationships and to confirm the impact of rent-seeking behaviour on MNC performance.

1.5 Research Relevance

The knowledge gained from this study will enable the executives of multinational firms with subsidiaries in the periphery of the global economy, or more specifically in South Africa to adapt their global business strategy to better support the profit maximisation goal.

1.6 Scope and Limitations

The research focusses on the links between and impact of headquarter control, rent-seeking behaviour, inter-subsidiary cooperation, competition and coopetition on MNC performance. MNCs from developed countries (Western Europe, Japan and the United States of America) that operate in South Africa are studied. This makes the study most applicable to companies operating within South Africa.

2 Literature Review

2.1 Local-Global Tensions in Multinational Corporations

Myloni, Harzing and Mirza (2007, p.2059) define a Multinational Corporation (MNC) as a "network of resource transactions among subsidiaries located in different countries." According to Festing *et al.* (2007) an MNC comprises a trans-national network that consists of interdependent competence centres all contributing to the competitiveness of the firm.

Within these MNCs, the structure of the relationship between the headquarters and their subsidiaries is one of the core issues which require further analysis (Birkinshaw *et al.*, 2000). In the course of globalisation, subsidiaries are becoming increasingly important to the competitiveness of MNCs because they are developing their own distinct resources and contributing more towards global turnover (Luo, 2005; Tsai, Yu and Lee, 2006).

The structure of the headquarter-subsidiary relationship, however, remains a contentious issue, with various authors supporting the case for central decision making by the MNC headquarters (Birkinshaw *et al.*, 2000; Ambos, Ambos and Schlegelmilch, 2006; Andersson *et al.*, 2007; Bouquet *et al.*, 2008). Other authors, however, believe that firms in pursuit of a multinational strategy should rather focus on local responsiveness by

decentralising their strategic and operating decisions (Luo, 2003; Festing *et al.*, 2007; Fisher and Bonn, 2007).

2.1.1 Need for Headquarter Centralisation

Birkinshaw *et al.* (2000) argue that most headquarters prefer increased control and therefore promote centralised decision making. Andersson *et al.* (2007) also support this and make a powerful argument for greater headquarter control. Andersson *et al.* (2007) believe that when an individual subsidiary makes an investment decision, it will only consider its own interests. The subsidiary's own local business environment will also significantly influence the decision and may even introduce bias in the decision making process. The MNC headquarters will, however, also consider all other subsidiaries and the global picture when making its investment decisions. The global headquarters therefore better considers the long term goals and the strategic imperatives of the entire organisation (Andersson *et al.*, 2007).

According to Bouquet *et al.* (2008), headquarter centralisation causes an increase in headquarter control and headquarter compliance. Andersson *et al.* (2007) also support this view and believe that increased headquarter control and monitoring of subsidiaries is an appropriate response to subsidiaries that aim to maximise their own budget allocation. Although there seems to be some support for greater headquarter compliance and

control, subsidiaries often have negative connotations of both these elements (Bouquet *et al.*, 2008).

Asakawa (2001) believes that the MNC subsidiaries' desire for greater autonomy and influence within the MNC creates tension between the subsidiary and its headquarters. Increased headquarter centralisation and control can, however, assist to reduce tensions within the firm by establishing a guiding set of rules and principles through which investment and budget is allocated throughout the organisation. These rules can create a framework, which if managed properly with fairness and integrity, can ultimately improve headquarter-subsidiary and inter-subsidiary cooperation within the MNC as a whole.

Headquarter control can, however, erode in different ways. Mudambi *et al.* (2004) found that providing subsidiaries with higher levels of bargaining power will erode headquarter control. According to Andersson *et al.* (2007), subsidiaries also often undermine headquarter control by obstructing the implementation of the headquarters' strategy and systems, or by simply "paying lip service to it" (Andersson *et al.*, 2007, p.803).

2.1.2 Need for Subsidiary Autonomy

A strong case, however, also exists for a decentralised strategy where subsidiaries have more autonomy within a MNC. Bouquet and Birkinshaw (2008, p.33) found that too much attention from

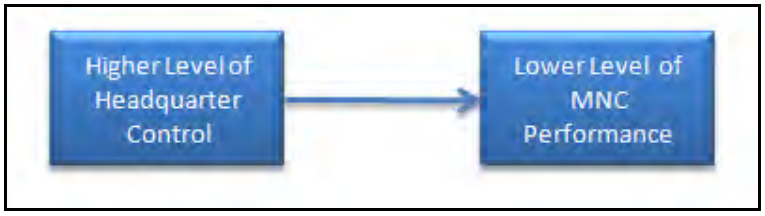
headquarters, which results in "high and often unreasonable expectations" from headquarters, will inhibit subsidiary performance owing to the time wasted to entertain visiting corporate executives. Birkinshaw *et al*. (2000) also found that higher levels of headquarter control leads to lower cooperation levels between subsidiaries and headquarters. Mudambi *et al*. (2004) support this view and believe that the net effects of tight headquarter monitoring are negative.

According to Mudambi *et al*. (2004), excessive control by headquarters may often prevent the subsidiaries and ultimately the MNC from realising the benefits of having strategically independent subsidiaries. Within MNCs, "the competitive activity occurs at the subsidiary level" (Yu, Subramaniam & Canella Jr., 2009, p.128). The MNC headquarters therefore needs to provide local subsidiaries with the necessary leverage and strategic flexibility to compete effectively within its local market. The MNC headquarters is also dependent on its subsidiaries to seize local market opportunities (Luo, 2003). Allowing more strategic independence to local subsidiaries would therefore improve local market responsiveness and thereby optimise the overall financial performance of the MNC.

There are various other benefits to having a decentralised strategy within a MNC. These benefits include: effectively integrating local competencies and resources, improved learning from local innovation systems and effectively introducing and integrating dynamic local thinking into the

parent MNC (Rugman and Verbeke, 2001; Andersson, Forsgren and Holm, 2002; Mudambi *et al*., 2004). Figure 1 shows this relationship between headquarter control and MNC performance.

Figure 1: Relationship between Headquarter Control and MNC Performance



2.2 Developing a Competitive Advantage within MNCs

Doz and Prahalad (1991); Kotabe *et al.* (2004); Luo (2005) and Festing *et al.* (2007) all identify the effective coordination of global resources, which allows the MNC to respond to opportunities that arise in different parts of the world, as a key success factor for MNCs. An integral part of this global resource coordination, is a firm's global sourcing strategy, commonly referred to as the strategic global sourcing decision.

Strategic global sourcing decisions have become a critical determinant of business performance in recent years (Kotabe *et al.*, 2004). Kotabe *et al*. (2004) and Yu *et al.* (2009) also believe that MNCs with global sourcing strategies have a competitive advantage over domestically bound firms. Yu *et al.* (2009) further highlight the economies of scale and cost

advantages which MNCs can create, through the effective integration and expansion of their global operations.

Effective knowledge integration and cooperation between MNC members also create a source of competitive advantage for the MNC (Holm, Holmström and Sharma, 2005; Ambos *et al.*, 2006). Subsidiaries may integrate domestic market knowledge resulting in further global learning by the MNC (Hakanson and Nobel, 2001; Foss and Pedersen, 2002; Holm *et al*., 2005; Ambos *et al*., 2006). Andersson *et al*. (2002) also argue that foreign subsidiaries can generate valuable competencies through this inter-subsidiary collaboration, which allows an MNC to "gain access to rare and inimitable resources and capabilities" (Holm *et al*., 2005, p.200). This continuous learning process ultimately allows the MNC to develop and sustain an enduring competitive advantage (Ambos *et al*., 2006).

The challenge for MNCs, however, remains the development and implementation of appropriate coordinating systems between subsidiaries without compromising responsiveness within local markets (Bartlett, Ghoshal and Birkinshaw, 2004). This coordination system can either promote competitive or cooperative inter-subsidiary relationships. According to Ambos *et al.* (2006), subsidiary cooperation plays a crucial role in creating a competitive advantage within a MNC. Holm *et al.* (2005, p.198), however, believe that the "competitive advantage of firms, is associated with competitive pressure from environmental actors". There

are therefore differing views as to whether a MNC should promote a cooperative or a competitive inter-subsidiary business strategy to achieve the best results and to develop a lasting competitive advantage.

2.3 Cooperation and Competition between Subsidiaries

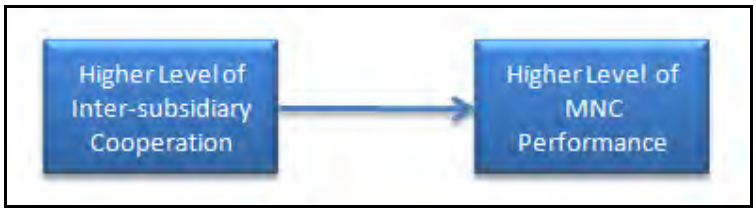
2.3.1 Cooperation between Subsidiaries

According to Fynes, de Burca and Voss (2005), cooperation is not simply the absence of conflict, but rather defined by firms working together to achieve mutual goals. Coordination, the central function of an MNC (Ghoshal and Bartlett, 1990), "is most effectively achieved through…cooperation" (Birkinshaw *et al*., 2000, p.331) between the various sub-units of the MNC. An MNC should therefore ensure the effective coordination of its sub-units (i.e. subsidiaries) by ensuring that there are high levels of cooperation between the various subsidiaries within the MNC.

Strong parent-subsidiary cooperation helps to mitigate emerging market threats (Luo, 2003). Strong inter-subsidiary cooperation can also assist the firm in achieving economies of scope (Luo, 2005), improve market learning and improve its financial results (Fynes *et al*., 2005; Luo *et al*., 2006). Fynes *et al.* (2005) also highlight that MNCs can achieve significant savings and improvements within their global supply chain through improved cooperation, communication and knowledge sharing.

Figure 2 shows the relationship between inter-subsidiary cooperation and MNC performance.

Figure 2: Relationship between Inter-subsidiary Cooperation and MNC Performance



According to Luo (2005), inter-subsidiary cooperation increases with an increase in:

- Strategic interdependence,
- Technological linkage and
- Headquarter ownership of the subsidiary.

Wu *et al.* (2005), however, believe that a cooperative inter-subsidiary relationship requires that both subsidiaries view the relationship as equitable.

2.3.2 Competition between Subsidiaries

MNCs tend to promote competitive inter-supplier relationships to ensure continued availability of materials, to exploit opportunities created by changing market conditions (Kotabe *et al.*, 2004) and to achieve efficiency in their operations (Luo, 2005). Companies that employ more competitive strategies insist on maintaining "various sources of supply

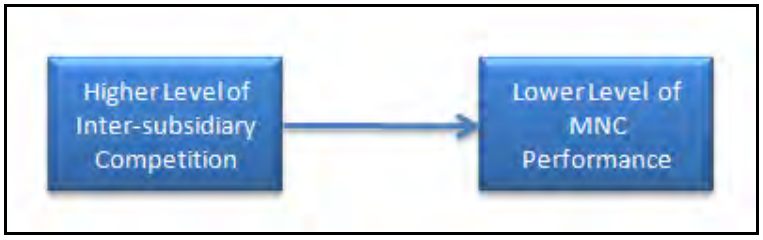
and a high degree of relative bargaining power" (Kotabe *et al.*, 2004, p.12).

Employing a competitive strategy, however, restricts the size of the companies' suppliers and subsidiaries (Kotabe *et al.*, 2004). The increased uncertainty associated with a competitive bidding strategy forces companies to focus on short term decisions which may adversely impact the firms profitability in the long run (Kotabe *et al.*, 2004). According to Luo (2005, p.76), inter-subsidiary competition increases with an increase in:

- "Local responsiveness,
- Market overlap and a
- Capability retrogression (decline or weakening of critical capability and resources)".

According to Luo (2003), support from headquarters increases a subsidiary's competitive advantages in the specific industry. This, however, raises the question: when corporate headquarters adopt a higher focus on competition within its inter-subsidiary strategy, will the initial winner in a competitive bid not continue to dominate in subsequent bidding since the support received from headquarters entrenched and strengthened the subsidiary's initial competitive advantages. Figure 3 depicts the relationship between inter-subsidiary competition and MNC performance.

Figure 3: Relationship between Inter-subsidiary Competition and MNC Performance



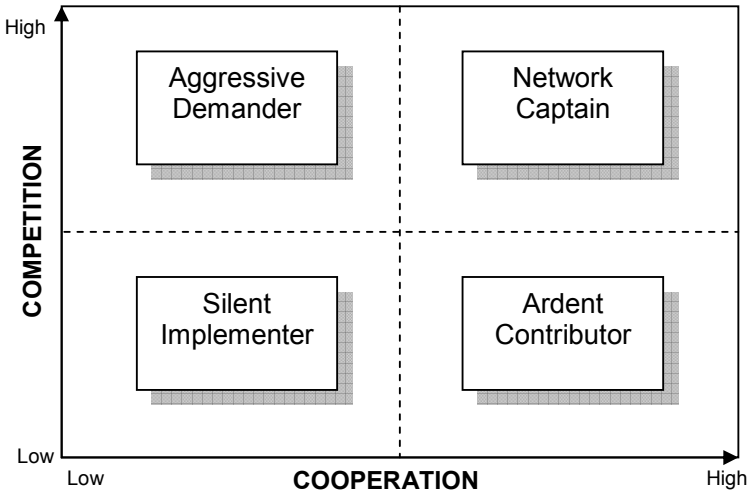
2.3.3 Combined Cooperation and Competition between Subsidiaries

According to Luo (2005), an MNC is a coordinated network of subunits which contains competitive as well as collaborative aims. Cooperation and competition therefore simultaneously coexist between subsidiaries (Ghoshal *et al.*, 1990; Luo, 2005; Wu *et al.*, 2005; Ross *et al.*, 2007), since subsidiaries are enforced or enticed to collaborate whilst they also compete for "limited parent resources, corporate support, power delegation, market expansion and global positioning" (Luo, 2005, p.73).

The combination of cooperation and competition between subsidiaries is referred to as coopetition (Luo, 2005; Luo *et al.*, 2006). An inter-subsidiary business strategy requires both cooperative and competitive elements to deliver exponential value, since "creating value is an inherently cooperative process, whilst capturing value is inherently competitive" (Luo, 2005, p.72).

Both cooperation and competition between subsidiaries are, however, "deliberate yet variable actions" (Luo, 2005, p.76), the intensity of which is determined by the MNC's business strategy. Figure 4 (adapted from Luo, 2005) shows cooperation and competition as an interdependent matrix, where a subsidiary might fall in either of the four defined quadrants based on its level of cooperation and competition determined by its inter-subsidiary business strategy.

Figure 4: Typology of Inter-Subsidiary Coopetition within a MNC

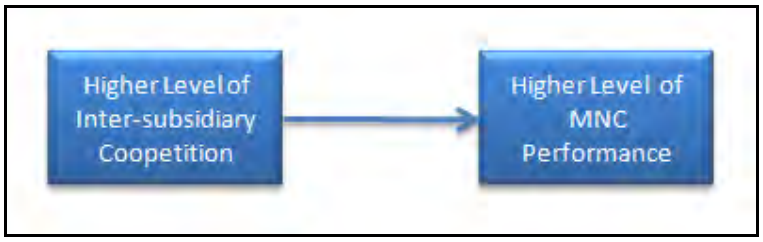


Source: Luo (2005)

According to Luo (2005), the level of cooperation will increase and competition will decrease if an MNC adopts a standard global strategy across all its subsidiaries. Luo (2005), however, also acknowledges that rivalry between subsidiaries creates a strong incentive to improve business performance. Various authors differ in their views as to whether an inter-subsidiary business strategy predominantly focussed on

cooperation or competition will deliver the best results (Holm *et al.*, 2005; Ambos *et al.*, 2006). Luo *et al.* (2006) and Ross *et al.* (2007), however, agree that a firm needs both cooperation and competition to reach its full performance potential. Figure 5 depicts the relationship between inter-subsidiary coopetition and MNC performance.

Figure 5: Relationship between Inter-subsidiary Coopetition and MNC Performance

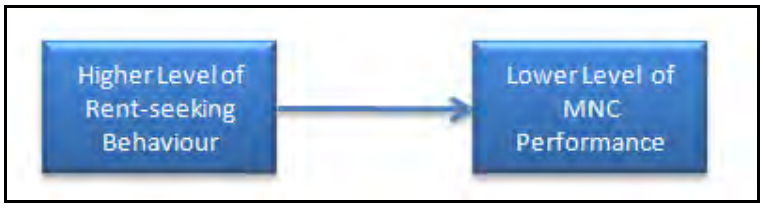


An additional factor which needs consideration is the subsidiary's own view on its role within the MNC. Birkinshaw *et al*. (2000) highlight the differences in perception between headquarters and its subsidiaries as to the role of the subsidiary within the MNC. Most subsidiaries' managers act in their self-interest, and subsidiaries have their own objectives, which are often not aligned to the objectives of the firm as a whole (Williamson, 1996; Birkinshaw *et al*., 2000; Mudambi *et al*., 2004). Rent-seeking behaviour theory explains this phenomenon.

2.4 Rent-seeking Behaviour within MNCs

Bouquet and Birkinshaw (2008) refer to rent-seeking behaviour as a method through which subsidiaries gain attention from headquarters to acquire specialised resources which can potentially be a source of future competitive advantage. Rent-seeking behaviour is, however, mostly viewed as an opportunistic and wasteful managerial intervention which ultimately destroys shareholder value (Scharfstein *et al.*, 2000; Foss, Foss and Vazquez, 2006). Figure 6 depicts this relationship between rent-seeking behaviour and MNC performance.

Figure 6: Relationship between Rent-seeking Behaviour and MNC Performance

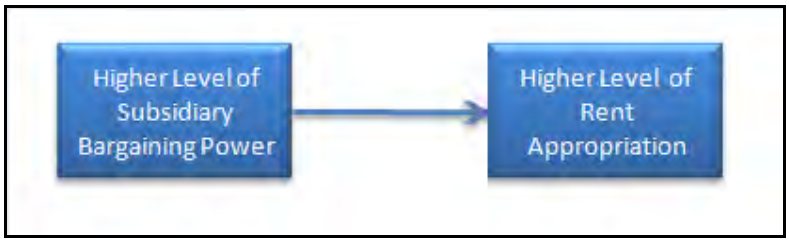


Scharfstein *et al*. (2000) further state that rent-seeking behaviour is more prevalent in weaker divisions. This therefore further supports the argument that rent-seeking behaviour will benefit weaker subsidiaries as they will receive a disproportionately high rent allocation. This resource misallocation can therefore lead to a sub-optimal profit achievement for the whole corporation. Mudambi *et al.* (2004), however, believe that the extent of rent-seeking behaviour (and the resulting resource misallocation) is more dependent upon the extent to which the subsidiary can use its bargaining power.

2.4.1 Subsidiary Bargaining Power and Rent-Seeking Behaviour

Mudambi *et al*. (2004) analysed this relationship between subsidiary bargaining power and the level of rent appropriation within a business. Within this study Mudambi *et al*. (2004) found that higher levels of subsidiary bargaining power lead to higher levels of rent appropriation (rent-seeking behaviour). Various other studies also support the view that higher levels of bargaining power, gained through the control of rent-generating resources, will cause higher levels of rent-seeking behaviour within a subsidiary (Coff, 1999; Mudambi *et al*., 2004; Andersson *et al*., 2007). Figure 7 shows this relationship:

Figure 7: Relationship between Subsidiary Bargaining Power and Rent Appropriation



Mudambi *et al*. (2004, p.385) further support this by adding that "many subsidiaries have acquired considerable strategic independence in all aspects of their operations, and are therefore able to exercise considerable intra-firm bargaining power to influence the distribution of the firm's resources." Scharfstein *et al.* (2000); Mudambi *et al.* (2004) and Andersson *et al.* (2007) argue that subsidiary managers can use this

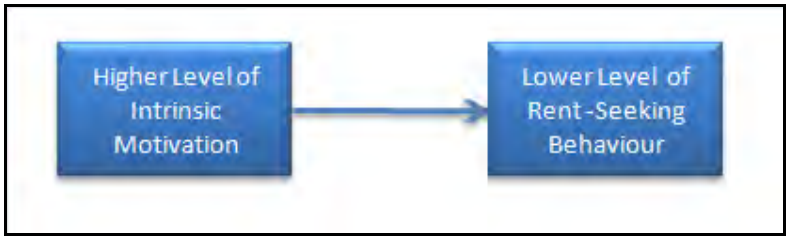
power to pursue agendas which do not support the company's profit maximisation goal.

According to Mudambi *et al*. (2004) rent-seeking by lower level managers within subsidiaries can also be another inhibiter to overall business performance. This is therefore counterproductive to the objective of maximising shareholder value since it may result in the unproductive allocation of capital to under-performing subsidiaries. Andersson *et al.* (2007) believes that an MNC parent which possesses greater knowledge about its subsidiaries will be able to better "assess claims made by the subsidiary when bargaining" (Andersson *et al.*, 2007, p.808) and therefore reduce the level of rent-seeking behaviour within its subsidiaries.

2.4.2 Intrinsic Motivation and Rent-Seeking Behaviour

Managers within subsidiaries are less likely to behave opportunistically when they are intrinsically motivated (Osterloh and Frey, 2000; Mudambi *et al*., 2004). Figure 8 shows this relationship.

Figure 8: Relationship between Intrinsic Motivation and Rent-seeking Behaviour



Mudambi *et al*. (2004, p.400) provide specific strategies for improving intrinsic motivation which include:

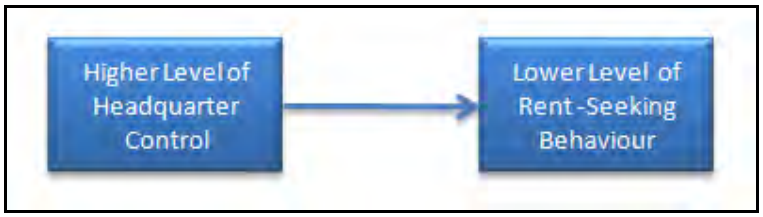
- "Joint goal-setting between headquarters and subsidiary managers,
- Inter-subsidiary team-based structures and
- Cross-subsidiary teams and task forces"

These proposed strategies are all aimed at improving headquarter-subsidiary and inter-subsidiary cooperation levels. Higher levels of cooperation within an MNC should therefore improve intrinsic motivation levels, which should ultimately reduce rent-seeking behaviour. Whilst reduced rent-seeking behaviour should lead to improved business performance.

2.4.3 Headquarter Control and Rent-Seeking Behaviour

Rent-seeking can also be constrained by implementing rigid, hierarchical structures within an organisation which make such rent-seeking more costly (Foss *et al*., 2006). Andersson *et al*. (2007, p.804) also support this view and believe that "headquarters' monitoring of subsidiary business networks" will assist in constraining rent-seeking behaviour. Andersson *et al*. (2007, p.803) also argue that "headquarters expects subsidiaries to indulge in rent-seeking behaviour, and therefore increases monitoring of subsidiaries". Figure 9 shows this relationship.

Figure 9: Relationship between Headquarter Control and Rent-seeking Behaviour



Frey (1998), however, suggests that constant monitoring by headquarters may make subsidiary managers more likely to behave opportunistically. Mudambi *et al*. (2004) also support this view and suggest that subsidiaries have both internal and external objectives where the external objective is to "maximise shareholders' value through market operations, whilst the internal objectives are linked to maximising capital allocation from headquarters" (Mudambi *et al*., 2004, p.386).

Frey (1998) further argues that if employees affected by change perceive headquarter intervention as controlling, their level of self-determination and self-esteem will be reduced and this then leads to a decrease in intrinsic motivation. As mentioned in the previous section, higher levels of intrinsic motivation will reduce rent-seeking behaviour (Osterloh and Frey, 2000; Mudambi *et al*., 2004). Controlling behaviour and excessive monitoring from headquarters can therefore actually result in an increase in rent-seeking behaviour at subsidiaries since managers will "lose their identification with the firm and its goals" (Mudambi *et al*., 2004, p.387). The increase in rent-seeking behaviour, caused by the headquarters'

controlling behaviour, will then ultimately negatively impact on the business performance of the MNC.

2.5 MNC Inter-subsidiary Theoretical Framework

From this discussion it is clear that the level of headquarter control and/or subsidiary autonomy will have an impact on the level of rent-seeking behaviour within a MNC. There are, however, divergent views as to whether an increase in headquarter control will reduce the level of rent-seeking behaviour within subsidiaries (Foss *et al*., 2006 & Andersson *et al*., 2007) or whether greater subsidiary autonomy will in fact cause a decrease in rent-seeking behaviour (Frey, 1998 & Mudambi *et al*., 2004). We will therefore study this relationship between the level of headquarter control and the level of rent-seeking behaviour within a MNC.

It is also evident from the literature that the level of headquarter control has a significant impact on MNC performance. Some authors support the case the greater headquarter control (Birkinshaw *et al*., 2000; Ambos, Ambos and Schlegelmilch, 2006; Andersson *et al*., 2007; Bouquet *et al*., 2008), whilst other authors believe that a strategy that supports greater levels of subsidiary autonomy will deliver the best financial results (Luo, 2003; Festing *et al*., 2007; Fisher and Bonn, 2007). We will therefore study the relationship between headquarter control and MNC performance.

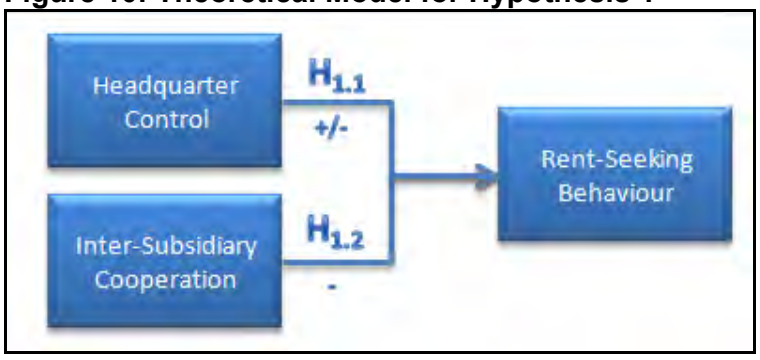
MNCs also promote different levels of inter-subsidiary cooperation and competition within their global business strategy (Luo, 2005). Luo *et al.* (2006) and Ross *et al.* (2007) argue that a business strategy which promotes both cooperation and competition (coopetition) should deliver the best firm performance. These studies, however, focussed on subsidiaries operating within the Triad of the global economy, where subsidiaries receive proportionally higher levels of foreign direct investment (FDI) and research and development investment from their parent companies (Narula *et al.*, 2002; Benito *et al.*, 2007). There is therefore a clear need for research to determine the ideal level of cooperation and/or competition which will deliver the best firm performance in an environment where subsidiaries operate on the periphery of the global economy.

Mudambi *et al.* (2004) also determined that lower levels of intrinsic motivation and higher levels of subsidiary bargaining power will cause an increase in rent-seeking behaviour within subsidiaries. However, higher levels of inter-subsidiary cooperation will cause an increase in intrinsic motivation levels (Mudambi *et al.*, 2004). An increase in inter-subsidiary cooperation levels should therefore lead to a decrease in rent-seeking behaviour within the MNC. A decrease in rent-seeking behaviour should also have a positive impact on the business performance of the MNC (Scharfstein *et al.*, 2000; Mudambi *et al.*, 2004; Foss *et al.*, 2006).

3 Research Hypotheses

From Chapter 2 it is clear that inter-subsidiary competition, inter-subsidiary cooperation, rent-seeking and headquarter control form a core part of any Multinational Corporation's business strategy. As mentioned in Section 2.5 , the first section of this study (hypothesis 1) will analyse the relationship between headquarter control, inter-subsidiary cooperation and rent-seeking behaviour within multinational firms. Figure 10 shows the relationship between these variables:

Figure 10: Theoretical Model for Hypothesis 1



To analyse these relationships we therefore need to study the following hypothesis:

Hypothesis 1.1 ($H_{1.1}$)

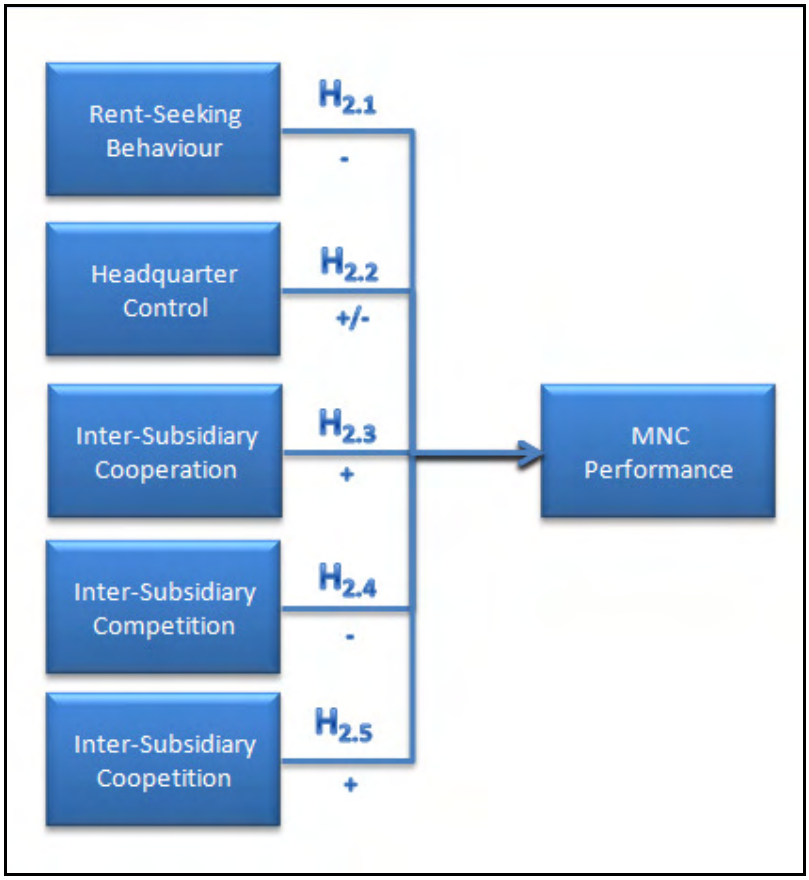
As mentioned in the literature there are divergent views whether higher levels of headquarter control will increase or decrease rent-seeking behaviour within the MNC. It therefore represents a competing hypothesis where: MNCs with higher levels of headquarter control will have either higher or lower levels of rent-seeking behaviour within the firm.

Hypothesis 1.2 ($H_{1.2}$)

Based on the literature, MNCs with higher levels of cooperation between subsidiaries will have lower levels of rent-seeking behaviour within the firm.

As mentioned in Section 2.5, inter-subsidiary competition, cooperation, coopetition, rent-seeking and headquarter control should also have a considerable impact on MNC business performance. Figure 11 shows the proposed model for the relationship between these variables, which hypothesis 2 explores.

Figure 11: Theoretical Model for Hypothesis 2



To analyse these relationships one therefore needs to evaluate the following hypothesis:

Hypothesis 2.1 ($H_{2.1}$)

MNCs with high levels of rent-seeking behaviour perform worse than MNCs with low levels of rent-seeking behaviour.

Hypothesis 2.2 ($H_{2.2}$)

As mentioned in the literature, there are conflicting views from various authors whether high levels of headquarter control will harm or improve MNC performance (see Section 2.5). It therefore presents a competing hypothesis where: MNCs with high levels of headquarter control perform either better or worse than MNCs with lower levels of headquarter control.

Hypothesis 2.3 ($H_{2.3}$)

MNCs with high levels of inter-subsidiary cooperation perform better than MNCs with lower levels of inter-subsidiary cooperation.

Hypothesis 2.4 ($H_{2.4}$)

MNCs with high levels of competition between subsidiaries perform worse than MNCs with lower levels of competition between their subsidiaries.

Hypothesis 2.5 ($H_{2.5}$)

MNCs with high levels of both cooperation and competition (coopetition) between subsidiaries perform better than MNCs with lower levels of coopetition between its subsidiaries.

4 Proposed Research Methodology and Design

This section provides details of the applied research methodology, the population, the unit of analysis, and the sampling method and size. It also includes further details of the data collection instrument, methodology and the data analysis techniques used within this study.

4.1 Applied Methodology

The study used a quantitative research design. The research aims were to expand the knowledge of MNC business strategy, in order to better understand the impact of various levels of rent-appropriation, cooperation and competition on subsidiary business performance. The study was a cross-sectional study since all data was collected once, at a single point in time.

4.2 Population of Relevance

The study focussed on subsidiaries of MNCs operating in South Africa. The population of relevance is middle and senior managers working in South Africa for a subsidiary of an MNC from the developed world, *id est*:

- United States of America,
- Western Europe and
- Japan.

Middle and senior managers represent the most suitable target population for the study, since they are involved in the daily decision making and

strategy execution of the firm. This group represents the core decision makers within each subsidiary and should therefore provide an accurate assessment of the level of cooperation, competition and rent-seeking between the various subsidiaries within each MNC. This study therefore assumes that any person who does not form part of the company's management team will not have the necessary business knowledge to make inferences about the firm's current business strategy.

4.3 Unit of Analysis

The proposed unit of analysis is managers working for Multinational Corporation subsidiaries operating in South Africa.

4.4 Sampling Method and Size

The study targeted all MNCs from Western Europe, Japan and the United States of America which have operational subsidiaries in South Africa. This study therefore used a census to target "all the individual elements which make up the population" (Zikmund, 2003, p.369). An initial list of MNCs was selected using the OSIRIS database. The initial list only included listed companies incorporated in North America, Western Europe and Japan. This initial list of 23,177 companies was further reduced to 611 firms by filtering the list to only include companies which had at least a 25% ownership in a South African subsidiary in the last seven years.

Through further analysis of the company list, another 69 firms were found to have either closed down or sold their South African subsidiary within the last five years. The analysis also identified three other South African companies that were listed as companies from Great Britain, because of their dual listing status. Both the inactive and the South African firms were removed from the company list.

The initial sample for the study therefore consisted of 539 MNCs from developed countries with a significant shareholding in an active South African subsidiary. Table 1 summarises the sample preparation.

Table 1: Initial Sample Frame

Description	Nr of Firms
MNCs from USA, Western Europe and Japan	23,177
25% Ownership in South African subsidiary	611
Excl. Inactive firms	542
Excl. South African companies	**539**

Based on the North America Industry Classification System's (NAICS) 2-digit primary code description methodology, the initial sample included the following number of firms from each industry (see Table 2).

Table 2: Initial Sample Frame (Per Industry)

Industry (based on NAICS 2007 2-digit primary code(s) description)	Number of Firms
Accommodation and Food Services	7
Administrative and Support and Waste Management and Remediation Services	11
Agriculture, Forestry, Fishing and Hunting	3
Arts, Entertainment, and Recreation	4
Construction	7
Finance and Insurance	25
Health Care and Social Assistance	2
Information	45
Management of Companies and Enterprises	12
Manufacturing	320
Mining, Quarrying, and Oil and Gas Extraction	20
Other Services (except Public Administration)	1
Professional, Scientific, and Technical Services	38
Real Estate and Rental and Leasing	3
Retail Trade	4
Transportation and Warehousing	15
Utilities	5
Wholesale Trade	17
Grand Total	**539**

The survey targeted managers working for the South African subsidiaries of each of the above mentioned firms.

4.5 Data Collection Instrument Design

Data was collected through an on-line questionnaire (survey) using the online questionnaire service called SurveyMonkey.com. A survey allows for data collection from the specific identified sample frame, which supports the objectives of this study (Zikmund, 2003). Another advantage of a survey is that it provides a "quick, inexpensive, efficient, and accurate means" (Zikmund, 2003, p.175) of gathering and assessing information about the target population.

The questionnaire design considered important guidelines like simplicity, avoiding ambiguity and avoiding loaded questions (Zikmund, 2003). An important consideration during the design stage was the length of the questionnaire. The questionnaire length was limited to increase response rates and thus decrease non-response error (Zikmund, 2003; Deutskens, De Ruyter, Wetzels and Oosterveld, 2004).

The questionnaire design also maintained relevancy by ensuring the questionnaire only collected information relevant to the research problem (Zikmund, 2003). The questionnaire maintained accuracy by ensuring all information collected was both reliable and valid (Zikmund, 2003). The questionnaire design also ensured that all words and phrases were clear, to avoid confusion or misunderstanding on the meaning of phrases or questions.

The questionnaire measured the perceived intensity of the variables included in the theoretical model and hypotheses, which include:

- Subsidiary autonomy (and headquarter control),
- Headquarter-subsidiary cooperation,
- Inter-subsidiary cooperation,
- Inter-subsidiary competition,
- Inter-subsidiary coopetition (by combining the results of the inter-subsidiary cooperation and competition measures),
- Rent-seeking behaviour (rent-appropriation) and

- Business performance, measured through the subsidiary's increase in market share over the last five years.

The complete questionnaire is included in *Appendix A*. The questionnaire predominately makes use of 7-point Likert rating scales which range from "strongly disagree" (1) to "strongly agree" (7) to measure the above mentioned variables. Table 3 shows the relationship between the variables identified in the theoretical model and the questions included in the questionnaire.

Table 3: Description of Variables

Variable	Variable Description	Questionnaire/Source
SubAutonomy	Subidiary autonomy (Inverse of Headquarter control)	Q4.6, Q4.7
Cooperation	Inter-subsidiary cooperation	Q4.1, Q4.2, Q4.3, Q4.4, Q4.5
Competition	Inter-subsidiary competition	Q5.1, Q5.2, Q5.3, Q5.4, Q5.5, Q5.6, Q5.7, Q5.8, Q5.9, Q5.10
Coopetition	Combination of inter-subsidiary cooperation and competition	Q4.1, Q4.2, Q4.3, Q4.4, Q4.5, Q5.1, Q5.2, Q5.3, Q5.4, Q5.5, Q5.6, Q5.7, Q5.8, Q5.9, Q5.10
Rent	Rent-seeking behaviour	Q6.1, Q6.2, Q6.3, Q6.4
Dom_MS_Incr	Subsidiary's increase in market share over the last 5 years	Q3.1
Glob_ROS_Incr	MNC's increase in return on shareholder funds (%) over the last 5 years	Objective measure (Actual Financial Statement Information sourced from OSIRIS database)

The questions which measure subsidiary autonomy (which is the inverse of headquarter control) were adapted from research conducted by Birkinshaw *et al.* (2000). Birkinshaw *et al.* (2000) tested and confirmed the validity of these questions. According to Birkinshaw *et al.* (2000, p.336) the "…validity of the constructs was found to be good, as factor loadings and R^2-values between the constructs and indicators were relatively high and t-values were significant".

The set of questions (see Table 3) which measured the perceived strength of cooperation, competition and coopetition between subsidiaries within each MNC were adapted from a measurement instrument developed by Luo, Slotegraaf and Pan (2006). The initial measurement instrument used six criteria to measure "cross-functional cooperative intensity" (Luo *et al.*, 2006, p.77). These questions were adjusted to measure cross-subsidiary cooperative intensity. Similarly, ten of the 11 criteria used by Luo *et al.* (2006, p.77) to measure "cross-functional competition" were adjusted to measure inter-subsidiary competition and included in the final questionnaire. The questions included two reverse coded questions to improve the accuracy of the data. The questions were all randomly sorted to reduce bias further.

The section on rent-seeking behaviour, which is discussed in the literature review, was used to develop an accurate measure for rent-seeking behaviour. The research conducted by Mudambi *et al*. (2004) documented a clear link between subsidiary bargaining power and the level of rent-

appropriation within a firm (see Section 2.3). The first set of questions was adopted from the Mudambi *et al*. (2004) study and measured the perceived strength each subsidiary's bargaining power within the MNC. To enable an accurate comparison with the Mudambi study, the exact same questions were used within the questionnaire.

The last set of dependent variables (y-variables) measures MNC performance:

- The first measure is a perceptual measure that measures the MNC subsidiary's domestic market share increase over the last five years using a 7-point Likert rating scale which ranges from "strongly disagree" (1) to "strongly agree" (7). Luo et al. (2006) used this performance criterion to accurately assess and compare the performance of companies operating in different industries. This measure provides a relatively fair measure of company performance across various industries since it excludes most external market forces.
- The second measure is an objective measure: change in return on shareholders' funds (measured as a percentage) over the last five years. Again this is a relatively fair measure which over the same time period tracks improvement in performance from the shareholders' perspective for the various firms. The data for this measure was sourced from the OSIRIS database which consolidates financial statement information for the companies included in the sample frame.

An initial draft questionnaire was prepared and sent to academic and industry experts for pre-testing. The feedback received from this pre-test was included in the final questionnaire to improve the quality and coverage of the questionnaire. Pre-testing also ensured that all questions were clear, easily interpretable and unambiguous.

4.6 Data Collection Process

Data was collected through a self-administered online questionnaire, using an online questionnaire tool from SurveyMonkey. A self-administered questionnaire was ideal for the purpose of the study since it eliminated interviewer bias and also allowed for anonymous responses. Anonymity was a prerequisite because of the sensitive nature of the study. An internet survey is also a cost effective method to reach large audiences, since the incremental cost of reaching additional respondents is marginal (Zikmund, 2003).

Herbert and Vorauer (2003) demonstrated through their research that respondents tend to provide more negative feedback when communicating through a computer mediated (for example, online) mode, compared to a face-to-face communication medium. Both McKenna and Bargh (2000) and Kurtzberg, Naquin and Belkin (2005), however, agree that the more negative comments may actually be more accurate. Respondents feel more anonymous using the online feedback medium since “they are freed

from the constraints of social obligation" (Kurtzberg *et al.*, 2005, p.218). An internet survey therefore ensures respondent confidentiality which removes interviewer bias and reduces social desirability bias.

Since the internet survey also allowed for accurate real-time data capture, it reduced administrative error often caused by incorrect data capturing (Zikmund, 2003). The main advantage, however, was the speed with which new respondents could be reached. Simply sending the web-link to new respondents allowed the researcher to access new potential respondents. Research by Ilieva, Baron and Healey (2002) revealed that the average response time in online surveys is 5.59 days, compared to an average response time of more than 12.21 days for mail surveys. The online survey technique was therefore ideal considering the limited amount of time and money available for the study.

The main disadvantage of internet surveys, identified by Zikmund (2003), is that certain sectors of the population have limited accessibility to the internet. This constraint did not, however, affect the study, since the target population (see Section 4.2) were managers working for MNCs, all of whom had e-mail and internet access. The study used the mixed mode survey methodology as proposed by Cobanoglu, Warde and Moreo (2001); and Zikmund (2003). This methodology is recommended for internet surveys and proposes initial recruitment by telephone, after which the online questionnaire is administered. Using this approach increases the response rate and therefore also limits non-response error.

An initial contact list was constructed for each of the companies included in the sample using current business contacts, trade association information, GIBS student information and company websites. The companies which only had generic contact information were contacted telephonically to find specific contact information for a manager who would have the necessary knowledge about the firm's business strategy and could thus participate in the study. These contacts were then added to the SurveyMonkey contact list. All e-mail requests were sent directly from the SurveyMonkey website. The website kept track of who had already completed the questionnaire and follow-up requests were only directed at respondents who had not yet completed the questionnaire.

According to Zikmund (2003), an online internet survey requires extensive follow-up to improve response rates. The study used the guidelines on follow-up procedures as proposed by Deutskens *et al.* (2004). After the initial request was e-mailed to respondents, respondents were telephonically contacted to ensure that they received the request. Eight days after this initial request, a follow-up e-mail was sent to non-respondents. A final request was e-mailed to non-respondents eight days after the second request. An option to opt out of the study was included in all these requests and respondents who selected this option were excluded from any follow-up requests.

In addition to the questionnaire, secondary data was collected to quantify various control variables used within the study. It is usually quicker and less expensive to collect secondary data, compared with primary data (Zikmund, 2003). These control variables, their descriptions and the secondary data source used are listed in Table 4.

Table 4: List of Control Variables

Control Variables	Variable Description	Secondary Data Source
Yrs_in_country	Years that MNC has had a subsidiary in the country	Internet
Industry	Industry classification based on NACE classification codes	OSIRIS database
HQ	MNC headquarters region	OSIRIS database
Size_employ	Size of company based on number of employees	OSIRIS database
Size_turnover	Size of company based on annual turnover	OSIRIS database

4.7 Data Analysis Approach

All questionnaires received from respondents who did not form part of the population of relevance were excluded from the study. The rest of the questionnaires were evaluated and “edited” – a process of checking and adjusting data for omissions and consistency (Zikmund, 2003). All missing fields were left empty, to ensure that there are no distortions to the data. All the edited data was then captured in a spreadsheet and summarised using frequency tables, cross tabulations and other descriptive statistics.

Zikmund (2003, p.300) defines reliability as "the degree to which measures are free from error and therefore yield consistent results". The Cronbach's alpha measure was used to test the internal consistency of the independent variables and reliability of each measure. The generally accepted benchmark for this measure is above 0.65 (Zikmund, 2003), but a Cronbach's alpha of 0.7 or higher is an indication that the measure has a strong reliability (Luo *et al.*, 2006).

The final composite variables were then calculated considering the results of the reliability measures mentioned above. Both descriptive statistics and normality tests for each of the composite variables were completed using the kurtosis, skewness and omnibus tests. A full set of normality tests, which included the Shapiro-Wilk and Anderson-Darling tests, was completed for variables which did not pass the initial normality tests.

The results were next analysed to determine whether there were any significant differences between the variables based on the control variable subgroups (see Table 4) using the Multivariate Analysis of Variance (MANOVA) method. The results for each of the sub-groups were tested to confirm normality using the Kruskal-Wallis test if the subset included less than 30 respondents.

Linear- regression analysis (Ordinary Least Squares) was used to analyse and test each of the hypotheses. Each regression analysis was tested to

confirm the underlying assumptions for a linear regression. Based on Hintze (2007), these assumptions are:

- Linearity: A linear relationship between the dependent and independent variable is assumed. Based on the literature review it is fair to assume that the variables listed in the theoretical model may show a linear relationship.
- Constant variance: The model assumes that the variances of the residuals are constant for all values of x (independent variables).
- Normality: It is assumed that the data is normally distributed when using hypothesis tests. A sufficiently large sample was collected to ensure sufficiently large degrees of freedom, which supports the normality assumption.
- Independence: The residuals of observations are assumed to be uncorrelated with one another, which implies that the dependent variables (y's) are also uncorrelated.
- Multicollinearity (only with multiple regressions): Multicollinearity or collinearity, exists when there are near-linear relationships among the independent variables within a dataset.

When analysing the regression data a combination of correlation results, t-tests and F-tests were used to test the hypotheses and to make statistical inferences about the data.

4.8 Potential Research Limitations

The proposed research methodology aims to reduce the research limitations as much as possible; however, the following limitations seem inevitable:

- Only using information from managers working for South African subsidiaries may introduce bias due to country specific economic or geographical circumstances.
- The study only focusses on MNCs which operate within South Africa. The results of the study may therefore include some regional bias and will therefore not necessarily apply to subsidiaries operating in other parts of the world.

5 Results

5.1 Participant Responses

63 out of 539 potential respondents completed the online questionnaire. This represents an actual response rate of 12% for the study. According to Jones (2008) there is a general recognition that electronic surveys can receive response rates as low as 5%. “Although there is no agreed to standard for a minimum response rate, it is important to receive a minimum 10 per cent response rate in order to comment on the significance of the findings” (Nickson, Warhurst and Dutton, 2005, p.199). The actual response rate of 12% was therefore sufficient to ensure the significance of the findings.

Another important consideration is the degrees of freedom. The higher the degrees of freedom for a sample, the more accurately the sample distribution will reflect the normal distribution (Albright, Winston and Zappe, 2005). The general rule is that when the total degrees of freedom are more than 30, then the “sample is said to accurately approximate the population for the population parameters to be considered normally distributed” (Albright *et al.*, 2005, p.425).

The degrees of freedom (*df*) for a multivariate problem are calculated using the following equation:

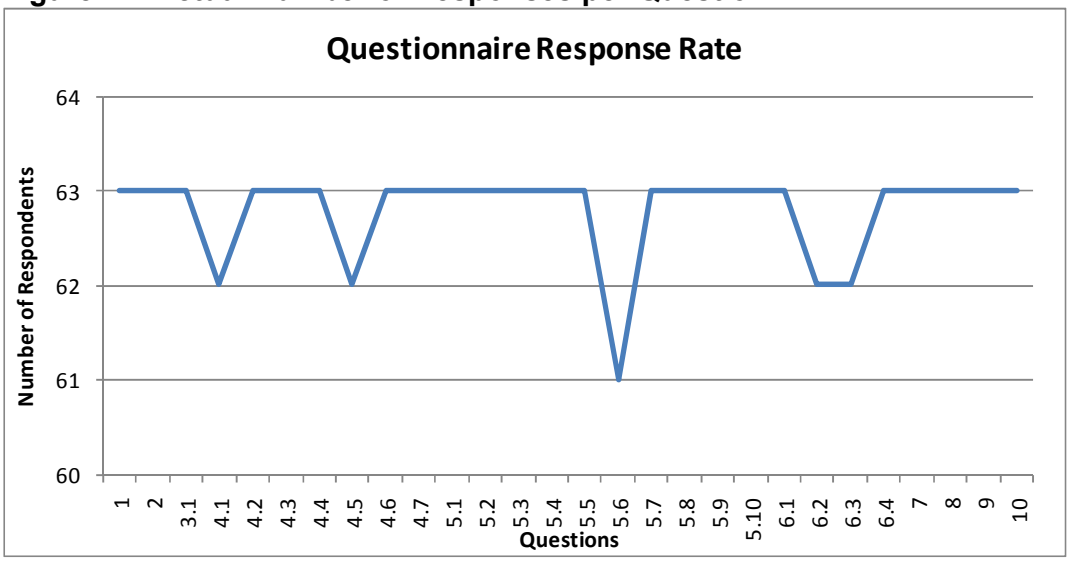
$$df = n - k - 1$$

where *n* is the sample size and k is the number of independent variables within the multiple regression.

The lowest degrees of freedom within this study occured with the regression analysis of Hypothesis 2, where the highest number of independent variables is used within the regression model. With this analysis there are five independent variables and five control variables. The total degrees of freedom (*df*) are therefore 52 (63 – 10 – 1). This is still significantly above the minimum threshold of 30. The actual number of respondents was therefore sufficient to enable the accurate analysis of the data using regression analysis.

The actual number of respondents who completed each of the questions on the questionnaire is shown in Figure 12.

Figure 12: Actual Number of Responses per Question



Overall, the respondents completed most of the questions and only six missing values were recorded for five different questions. Since each variable is a summation of several different questions, this did not, however, affect the accuracy of the overall study. These data points were simply logged as "missing" and excluded from the calculation of the final composite variables.

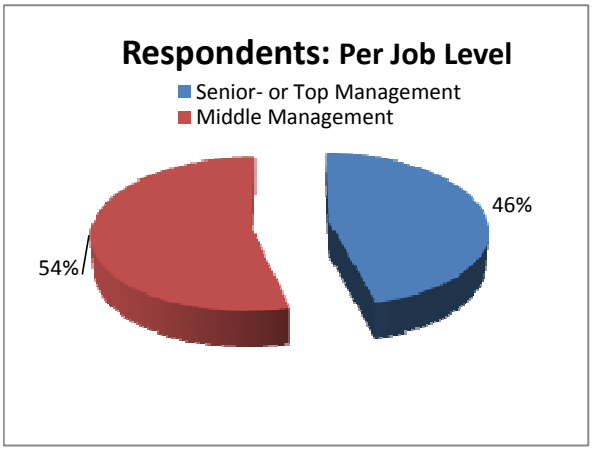
Table 5 shows the number of respondents and response rates per industry. It is clear from this table that the key South African industries, namely the Manufacturing (49/320) and Mining (4/20) industries, were well represented within this study.

Table 5: Response Rate per Industry

Industry Classification (NAICS 2007 2-digit)	Sample Frame	Actual Nr. Of Respondents	Response Rate
Accommodation and Food Services	7	1	14%
Administrative and Support and Waste Management and Remediation Services	11	0	0%
Agriculture, Forestry, Fishing and Hunting	3	0	0%
Arts, Entertainment, and Recreation	4	0	0%
Construction	7	0	0%
Finance and Insurance	25	1	4%
Health Care and Social Assistance	2	0	0%
Information	45	2	4%
Management of Companies and Enterprises	12	1	8%
Manufacturing	320	49	15%
Mining, Quarrying, and Oil and Gas Extraction	20	4	20%
Other Services (except Public Administration)	1	0	0%
Professional, Scientific, and Technical Services	38	2	5%
Real Estate and Rental and Leasing	3	1	33%
Retail Trade	4	0	0%
Transportation and Warehousing	15	1	7%
Utilities	5	0	0%
Wholesale Trade	17	1	6%
Grand Total	**539**	**63**	**12%**

Figure 13 shows the number of respondents per job level. Based on this information 29 of the 63 respondents (46%) who completed the study are either senior or top management within their respective companies. The other 34 respondents are all middle managers at their firms.

Figure 13: Respondents per Job Level



5.2 Questionnaire Descriptive Statistics

The next section evaluates the actual responses received for each of the questions included in the questionnaire. As mentioned in Section 4.5 (see Table 3) the questionnaire measured various dependent and independent variables through 7-point Likert rating scales which ranged from “strongly disagree” (1) to “strongly agree” (7). This standard unit of measure allows for comparison of the questions and variables and therefore also ensures consistency across these measures. The complete frequency table report for these questions is included as *Appendix B*. The descriptive statistics for each question is also included in Table 6.

Table 6: Descriptive Statistics of Questionnaire Responses

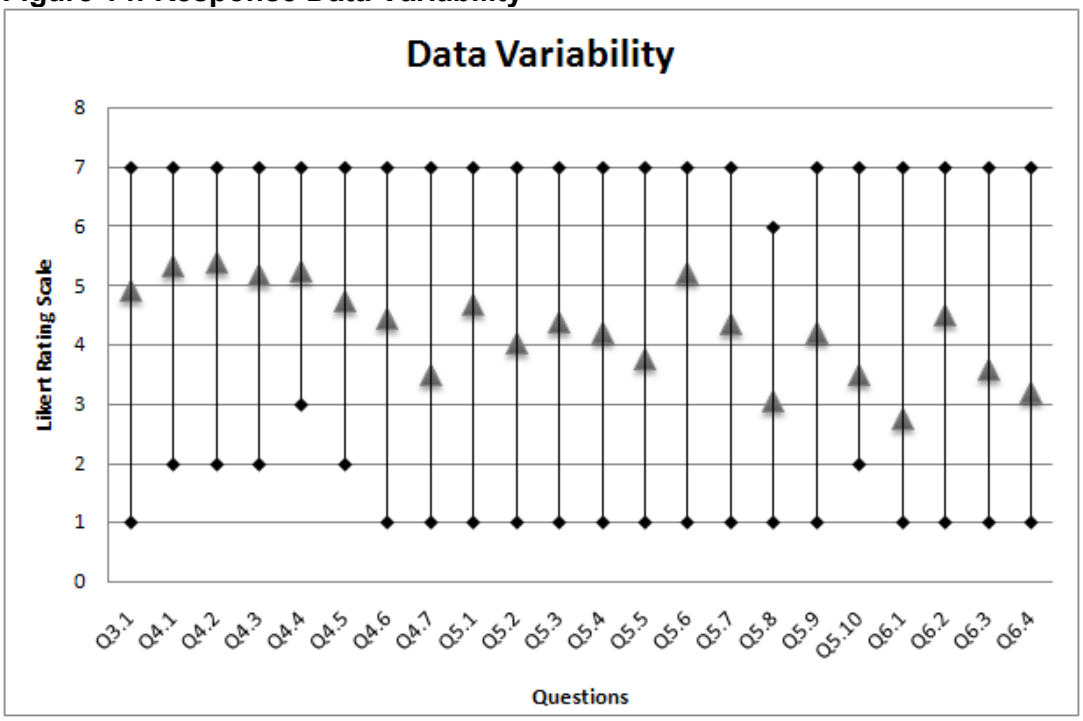
Question	Count	Mean	Median	Mode	Std. Error	Std. Dev.	Variance	Min	Max	Kurtosis	Skewness
Q3.1	63	4.92	5	6	0.21	1.68	2.82	1	7	0.15	-0.97
Q4.1	62	5.34	5	5	0.14	1.12	1.24	2	7	0.65	-0.71
Q4.2	63	5.40	6	6	0.15	1.17	1.37	2	7	1.25	-1.08
Q4.3	63	5.17	5	5	0.15	1.23	1.50	2	7	0.27	-0.73
Q4.4	63	5.25	5	5	0.15	1.19	1.42	3	7	-0.27	-0.51
Q4.5	62	4.74	5	5	0.16	1.23	1.51	2	7	0.19	-0.53
Q4.6	63	4.46	5	6	0.24	1.89	3.58	1	7	-1.05	-0.55
Q4.7	63	3.49	3	3	0.23	1.79	3.22	1	7	-1.16	0.10
Q5.1	63	4.70	5	6	0.19	1.54	2.38	1	7	0.02	-0.73
Q5.2	63	4.03	4	4	0.20	1.61	2.58	1	7	-0.68	0.04
Q5.3	63	4.38	4	4	0.20	1.57	2.47	1	7	-0.61	-0.17
Q5.4	63	4.21	4	5	0.21	1.71	2.91	1	7	-0.78	-0.07
Q5.5	62	3.77	4	2	0.21	1.63	2.67	1	7	-1.10	0.10
Q5.6	61	5.23	6	6	0.20	1.55	2.41	1	7	-0.17	-0.73
Q5.7	62	4.37	4	4	0.20	1.56	2.43	1	7	-0.63	-0.22
Q5.8	63	3.05	3	2	0.20	1.55	2.40	1	6	-0.83	0.46
Q5.9	63	4.22	4	4	0.21	1.69	2.85	1	7	-0.87	-0.26
Q5.10	63	3.51	3	2	0.18	1.44	2.06	2	7	-0.67	0.63
Q6.1	63	2.76	2	2	0.19	1.54	2.38	1	7	-0.31	0.74
Q6.2	62	4.50	5	6	0.22	1.75	3.07	1	7	-0.99	-0.36
Q6.3	62	3.58	3	2	0.21	1.68	2.84	1	7	-0.90	0.40
Q6.4	63	3.21	3	2	0.20	1.58	2.49	1	7	-0.48	0.51

From this statistical information we can conclude that:

- Most respondents completed all of the questions, and the data table contains only few missing values.
- The standard errors for each of the measures are relatively low, because of the relatively large sample size.
- Most of the questions, however, show a negative skew which is an indication that the mass of the distribution is concentrated more to the right of the distribution graph. The frequency tables included in *Appendix B* support this finding.
- The kurtosis for the distribution graph of each question is relatively flat (since most show a negative value) with a few outliers showing a positive kurtosis result.

Figure 14 shows the minimum, maximum and mean values based on the descriptive statistics for each of the response sets summarised in Table 6. The black diamonds indicate the minimum and maximum values whilst the blue triangle shows the mean response value for the specific question.

Figure 14: Response Data Variability



5.3 Reliability Confirmation for Variable Measurements

As mentioned in Section 4.7, the Cronbach's alpha measure is the generally accepted measurement to confirm convergent validity (Luo *et al.*, 2006) and internal reliability (Luo, 2003). NCSS's multivariate analysis correlation report was used to test the Cronbach's alpha for each of the independent variable to confirm the reliability of each measure. The detailed correlations reports which include the Cronbach's alpha test

results are included in *Appendix C*. Table 7 shows a summary of this report. To improve the reliability of the Competition measure, question 5.10 was removed from the measurement. Removing this question improved the Cronbach's alpha from 0.850 to 0.863.

Table 7: Reliability Confirmation for Independent Variables

Variable	Variable Description	Questionnaire	Initial Cronbach's α	Revised Cronbach's α
SubAutonomy	Subidiary autonomy (Inverse of Headquarter control)	Q4.6, Q4.7	0.693	
Cooperation	Inter-subsidiary cooperation	Q4.1, Q4.2, Q4.3, Q4.4, Q4.5	0.912	
Competition	Inter-subsidiary competition	Q5.1, Q5.2, Q5.3, Q5.4, Q5.5, Q5.6, Q5.7, Q5.8, Q5.9, Q5.10	0.850	0.863
Coopetition	Combination of inter-subsidiary cooperation and competition	Q4.1, Q4.2, Q4.3, Q4.4, Q4.5, Q5.1, Q5.2, Q5.3, Q5.4, Q5.5, Q5.6, Q5.7, Q5.8, Q5.9	0.800	
Rent	Rent-seeking behaviour	Q6.1, Q6.2, Q6.3, Q6.4	0.739	

Overall, however, the Cronbach's alphas for the various independent variable measurements exceeded the minimum benchmark of 0.65 (Zikmund, 2003). Most Cronbach's alpha measures also easily exceeded the 0.7 benchmark, which provides a clear indication that these measures had a strong reliability (Luo *et al.*, 2006).

5.4 Variable Calculation and Normality Tests

Considering the results of the reliability tests, the final composite variables were calculated as follows (see Table 8):

Table 8: Composite Variables

Var Type	Composite Variable	Variable Description	Calculation
Dependent Variables	**SubAutonomy**	Subidiary autonomy (Inverse of Headquarter control)	(Q4.6 + Q4.7)/2
	Cooperation	Inter-subsidiary cooperation	(Q4.1 + Q4.2 + Q4.3 + Q4.4 + Q4.5)/5
	Competition	Inter-subsidiary competition	(Q5.1 + Q5.2 + Q5.3 + Q5.4 + Q5.5 + Q5.6 + Q5.7 + Q5.8 + Q5.9)/9
	Coopetition	Combination of inter-subsidiary cooperation and competition	$\sqrt{(\text{Cooperation} * \text{Competition})}$
	Rent	Rent-seeking behaviour	(Q6.1 + Q6.2 + Q6.3 + Q6.4)/4
Independent Variables	**Dom_MS_Incr**	Subsidiary's increase in market share over the last 5 years	Q3.1
	Glob_ROS_Incr	MNC's increase in return on shareholder funds (%) over the last 5 years	Objective measure (Actual Financial Statement Information sourced from OSIRIS database)

Table 9 shows the descriptive statistics for each of the above mentioned composite- variables.

Table 9: Composite Variables Descriptive Statistics

Variable	Count	Mean	Median	Mode	Std. Error	Std. Dev.	Variance	Min	Max	Kurtosis	Skewness
SubAutonomy	63	3.98	4.5	4.5	0.20	1.61	2.60	1	7	-0.73	-0.38
Cooperation	63	5.15	5.2	5	0.13	1.00	1.01	2.6	7	0.42	-0.62
Competition	63	4.19	4.22222	4.333	0.14	1.11	1.23	1	6.33	0.51	-0.19
Coopetition	63	4.57	4.68568	4.655	0.10	0.81	0.66	2.28	6.27	0.56	-0.49
Rent	63	3.48	3.5	3	0.16	1.25	1.56	1	7	0.20	0.44
Dom_MS_Incr	63	4.92	5	6	0.21	1.68	2.82	1	7	0.15	-0.97
Glob_ROS_Incr	56	-9.38	1.84	#N/A	7.11	53.21	2831.31	-280	70.8	12.00	-2.81

From this table it is clear that:

- The mean for most of the variables is above the neutral measure (4), except for the subsidiary autonomy and rent-seeking behaviour measures.
- The recorded standard errors are also relatively small due to the sufficiently large sample size (63).
- There are small variances between the mean and median for each of the measures and the kurtosis measure for each of the variables is relatively close to the zero measure.
- Most of the variables have a slightly negative skew which indicates that the mass of the distribution is concentrated more to the right of the distribution graph.
- Most of the variables, however, seem to be normally distributed.

Normality tests were done on each of the independent composite variables and the results are summarised in Table 10.

Table 10: Variable Normality Test Results

	Skewness Test		Kurtosis Test			Omnibus Test			Variable
Variable	Value	Z	Prob	Value	Z	Prob	K2	Prob	Normal?
SubAutonomy	-0.38	-1.3	0.193	2.23	-1.63	0.104	4.34	0.114	Yes
Cooperation	-0.6	-2.01	0.044	3.29	0.87	0.387	4.8	0.091	No
Competition	-0.19	-0.67	0.504	3.37	0.98	0.327	1.41	0.495	Yes
Coopetition	-0.48	-1.63	0.104	3.42	1.05	0.295	3.74	0.154	Yes
Rent	0.43	1.48	0.140	3.09	0.54	0.588	2.48	0.290	Yes

Most of the variables are therefore normally distributed. The only independent variable which is not normally distributed is Cooperation. The

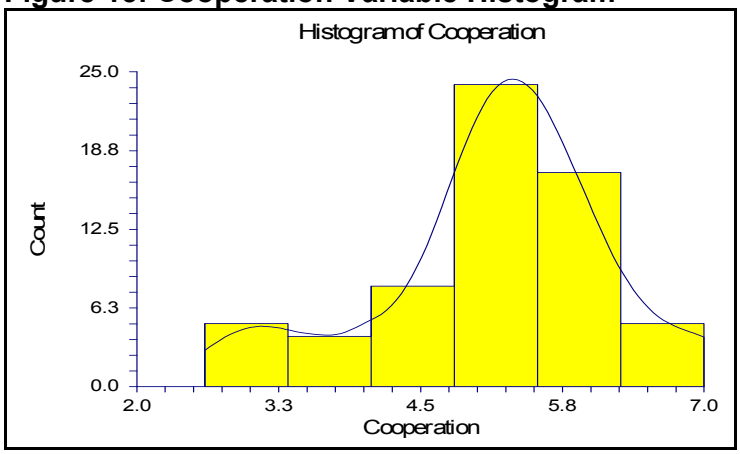
detail analysis of the normality tests for the Cooperation-variable, are shown in Table 11.

Table 11: Cooperation Variable Normality Tests

Test Name	Test Value	Prob Level	10% Critical Value	5% Critical Value	Decision (0.05)
D'Agostino Skewness	-2.0139	0.0440	1.645	1.9600	Reject normality
D'Agostino Kurtosis	0.8654	0.3868	1.645	1.9600	Can't reject normality
D'Agostino Omnibus	4.8046	0.0905	4.605	5.9910	Can't reject normality

Therefore only the skewness test identified some concerns with the variable whilst both the Kurtosis and Omnibus tests support the normality assumption. Based on a visual inspection of the distribution graph of the Cooperation-variable (see Figure 15), Johan Sauer, an actuary and statistics professor at the University of Pretoria, confirmed the distribution generally follows a normal distribution. He also confirmed that the probability levels calculated in the normality tests make it is safe to assume that the Cooperation-variable does in fact follow a normal distribution.

Figure 15: Cooperation Variable Histogram



5.5 Control Variables

Table 12 provides additional information on the control variables listed in Table 4 (see Section 4.6) and shows whether these variables are continuous or categorical variables.

Table 12: Control Variables: Data Type

Control Variables	Variable Description	Variable Type	Nr. Of Categories
Yrs_in_country	Years that MNC has had a subsidiary in the country	Continuous	N/A
Industry	Research intensity and industry classification based on NACE classification codes	Categorical	5
HQ	MNC headquarters region	Categorical	3
Size_employ	Size of company based on number of employees	Continuous	N/A
Size_turnover	Size of company based on annual turnover	Continuous	N/A

The categorical control variables are coded as shown in Table 13:

Table 13: Categorical Variables Coding

Control Variable	Categories	Abbreviation
Industry	High research-intensive manufacturing	HRIM
	Medium-high research-intensive manufacturing	MHRIM
	Medium-low research-intensive manufacturing	MLRIM
	Knowledge-intensive services	KIS
	General services	GS
HQ	North America	NA
	Europe	Eur
	Japan	Jpn

The next sections evaluate each of these control variables.

5.5.1 Years within the Country (Yrs_in_country)

Table 14 shows the descriptive statistics for the control variable which measured the number of years each participating company has operated within South Africa.

Table 14: Years in Country Descriptive Statistics

Variable	Count	Mean	Median	Mode	Min	Max
Yrs_in_country	63	43.03	40	13	3	149

From this table we can conclude that the mean number of years the participating companies have been in the country is 43 years, whilst the actual sample varied between 3 and 149 years. Siemens, Federal-Mogul Corporation and Ford Motor Company are three of the firms that have operated in South Africa for more than 100 years. Figure 16 shows the age distribution of the participating firms.

Figure 16: Years in Country Histogram

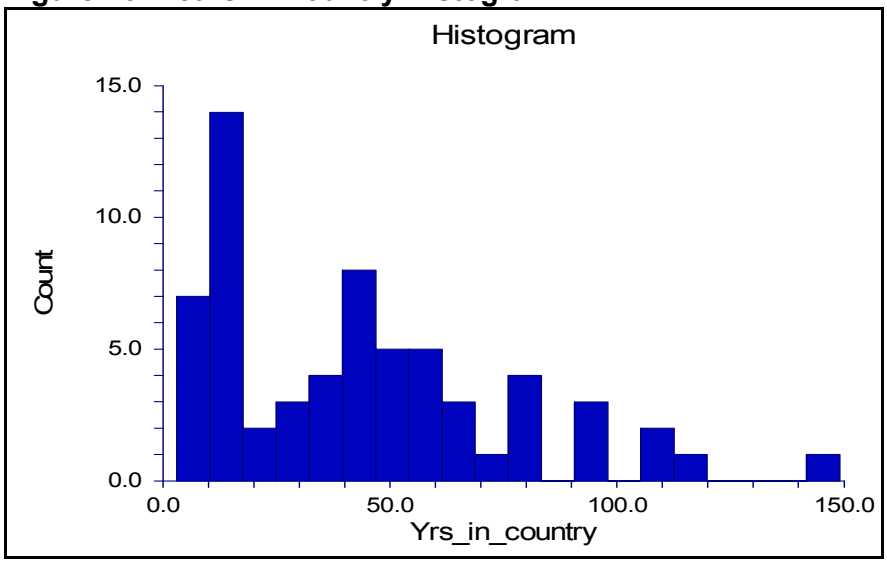


Table 15 shows the frequency distribution for the number of years each participating company has been operating within the country.

Table 15: Frequency Distribution for Yrs_in_country variable

Yrs_in_country	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
0 To 8	3	3	4.76	4.76	|
8 To 15	18	21	28.57	33.33	||||||||||
15 To 23	1	22	1.59	34.92	|
23 To 30	4	26	6.35	41.27	||
30 To 38	2	28	3.17	44.44	|
38 To 45	8	36	12.70	57.14	|||||
45 To 53	7	43	11.11	68.25	||||
53 To 60	4	47	6.35	74.60	||
60 To 68	4	51	6.35	80.95	||
68 To 75	1	52	1.59	82.54	|
75 To 83	3	55	4.76	87.30	|
83 To 90	1	56	1.59	88.89	|
90 To 98	3	59	4.76	93.65	|
105 To 113	2	61	3.17	96.83	|
113 To 120	1	62	1.59	98.41	|
143 To 150	1	63	1.59	100.00	|

From this information it is clear that most MNCs have been operating in South Africa between 8 and 15 years. This relatively low number of years is probably due to international sanctions which were imposed on South Africa until approximately 15 years ago, when a democratic government was elected in 1994. A large number of MNCs therefore only re-entered the country after these sanctions were lifted.

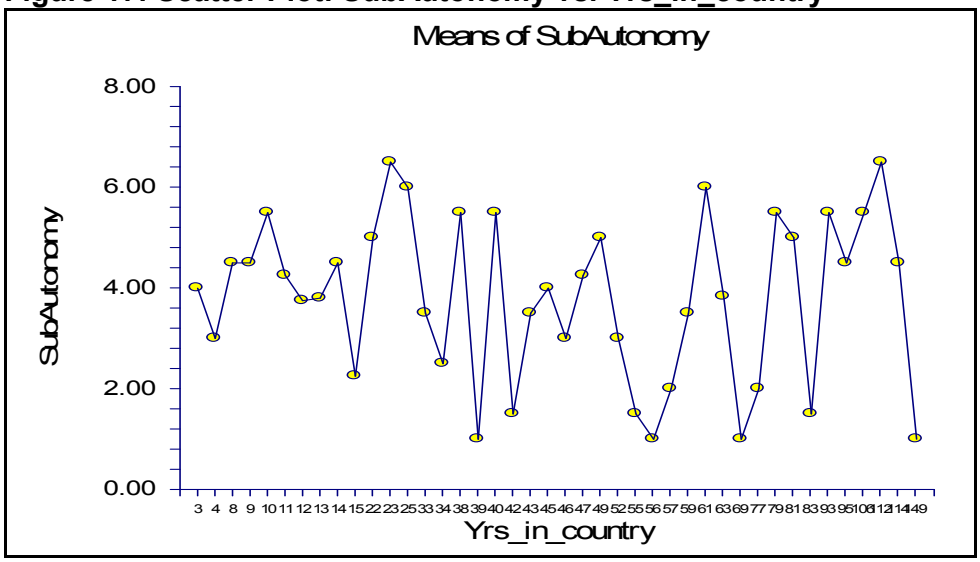
Testing the variables (see Table 8) for statistically significant differences based on the “Yrs_in_country” control variable using the MANOVA test yielded the following results (see Table 16).

Table 16: MANOVA Results for Control Variable: Yrs_in_country

Yrs_in_country	Test Value	DF1	DF2	F-Ratio	Prob Level	Decision (0.05)
Wilks' Lambda	0.0001	259	95	1.07	0.3579	Accept
Hotelling-Lawley Trace	26.3259	259	72	1.05	0.4211	Accept
Pillai's Trace	4.7785	259	126	1.05	0.3910	Accept
SubAutonomy	**2.9472**	**37**	**18**	**2.14**	**0.0437**	**Reject**
Cooperation	1.1149	37	18	1.43	0.2122	Accept
Competition	1.4376	37	18	1.51	0.1741	Accept
Coopetition	0.7177	37	18	1.15	0.3891	Accept
Rent	1.7177	37	18	1.26	0.3078	Accept
Dom_MS_Incr	2.8292	37	18	0.83	0.6960	Accept
Glob_ROS_Incr	2148.4040	37	18	0.51	0.9601	Accept

Therefore at the 95% confidence level, only the SubAutonomy (subsidiary autonomy) variable showed any statistically significant differences between its means for companies who have operated in South Africa for a longer period of time. Figure 17 plots these two variables together. Overall, the data still seems quite random with significant variability. Based on this graph it does, however, seem that MNCs which have been in the country for only a few years tend to provide more autonomy to their subsidiaries.

Figure 17: Scatter Plot: SubAutonomy vs. Yrs_in_country



5.5.2 Industry (NACE Classification)

The respondents per industry based on the NACE classification system, which is another categorical independent variable, shows that most of the respondents were from the "Medium-high research intensive manufacturing" sector (see Table 17).

Table 17: Frequency Distribution for Industry Variable

Industry	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
GS	6	6	9.52	9.52	|||
HRIM	4	10	6.35	15.87	||
KIS	4	14	6.35	22.22	||
MHRIM	35	49	55.56	77.78	||||||||||||||||||||
MLRIM	14	63	22.22	100.00	||||||||

Testing the variables for statistically significant differences based on the "Industry" control variable only yielded statistically significant difference for the SubAutonomy variable (see Table 18).

Table 18: MANOVA Results for Control Variable: Industry

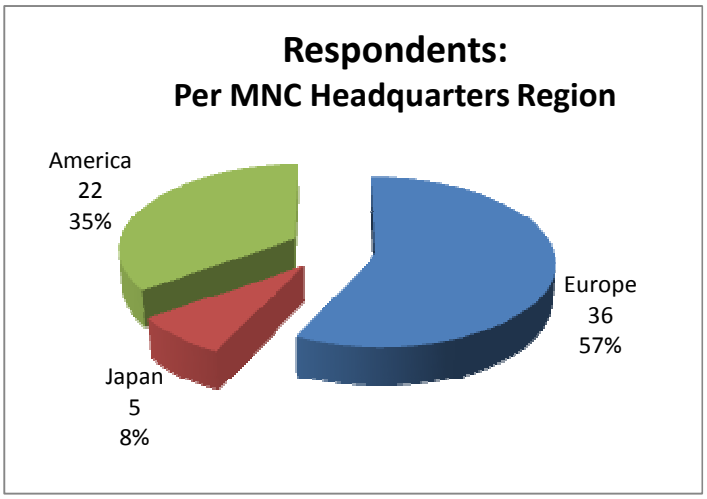
Industry	Test Value	DF1	DF2	F-Ratio	Prob Level	Decision (0.05)
Wilks' Lambda	0.5543	28	164	1.04	0.4200	Accept
Hotelling-Lawley Trace	0.6783	28	174	1.05	0.4006	Accept
Pillai's Trace	0.5194	28	192	1.02	0.4399	Accept
SubAutonomy	**7.5937**	**4**	**51**	**3.74**	**0.0096**	**Reject**
Cooperation	0.7207	4	51	0.7	0.5950	Accept
Competition	1.5122	4	51	1.2	0.3219	Accept
Coopetition	0.5526	4	51	0.79	0.5364	Accept
Rent	2.3062	4	51	1.49	0.2190	Accept
Dom_MS_Incr	1.5171	4	51	0.48	0.7480	Accept
Glob_ROS_Incr	1453.1315	4	51	0.49	0.7399	Accept

Since this statistically significant difference in SubAutonomy occurred in the knowledge intensive industry which had only four respondents, the difference is not further discussed in this study.

5.5.3 Headquarters Region (HQ)

Figure 18 shows the actual number of respondents from firms with headquarters in each of the three regions mentioned in Section 4.2. Most respondents (57%) are from firms with headquarters in Western Europe, 35% of the firms have headquarters in the United States of America whilst only five firms are from Japan.

Figure 18: Respondents per Headquarter Region



If we compare the actual responses received to the sample frame based on the number of firms from each country, it is, however, clear the actual responses received represent an accurate reflection of the initial sample frame based on the representation percentages of each region (see Table 19).

Table 19: Headquarters: Sample Frame vs. Actual Respondents

	Sample frame		Actual Response		Variance
	Count	%	Count	%	%
Europe	302	56%	36	57%	1%
Japan	29	5%	5	8%	3%
America	208	39%	22	35%	-4%
Total	**539**	**100%**	**63**	**100%**	**0%**

The variables were also tested for statistically significant differences based on the "HQ" control variable. The MANOVA test yielded the following results (see Table 20).

Table 20: MANOVA Results for Control Variable: HQ

Headquarters	Test Value	DF1	DF2	F-Ratio	Prob Level	Decision (0.05)
Wilks' Lambda	0.6861	14	94	1.39	0.1725	Accept
Hotelling-Lawley Trace	0.4344	14	92	1.43	0.1565	Accept
Pillai's Trace	0.3298	14	96	1.35	0.1912	Accept
SubAutonomy	3.8383	2	53	1.61	0.2092	Accept
Cooperation	0.5797	2	53	0.57	0.5705	Accept
Competition	1.6084	2	53	1.27	0.2889	Accept
Coopetition	1.0729	2	53	1.59	0.2128	Accept
Rent	0.5360	2	53	0.33	0.7231	Accept
Dom_MS_Incr	7.2366	2	53	2.53	0.0894	Accept
Glob_ROS_Incr	962.1405	2	53	0.33	0.7193	Accept

For the subsidiary headquarters control variable, none of the variables showed any statistically significant differences between its means at the 95% confidence level.

5.5.4 Company Size – Number of Employees (Size_employ)

Table 21 shows the descriptive statistics for the control variable which measured the size the participating companies based on the number of employees working for each company.

Table 21: Size in Number of Employees Descriptive Statistics

Variable	Count	Mean	Median	Min	Max
Size_employ	63	96315	79183	21	427000

From this table we can conclude that the mean size of the participating companies was 96,315 employees. The actual size, however, showed quite a large variance with the smallest company only having 21 employees and the biggest company 427,000.

Figure 19 shows the size distribution in terms of number of employees of the participating firms.

Figure 19: Number of Employees Histogram

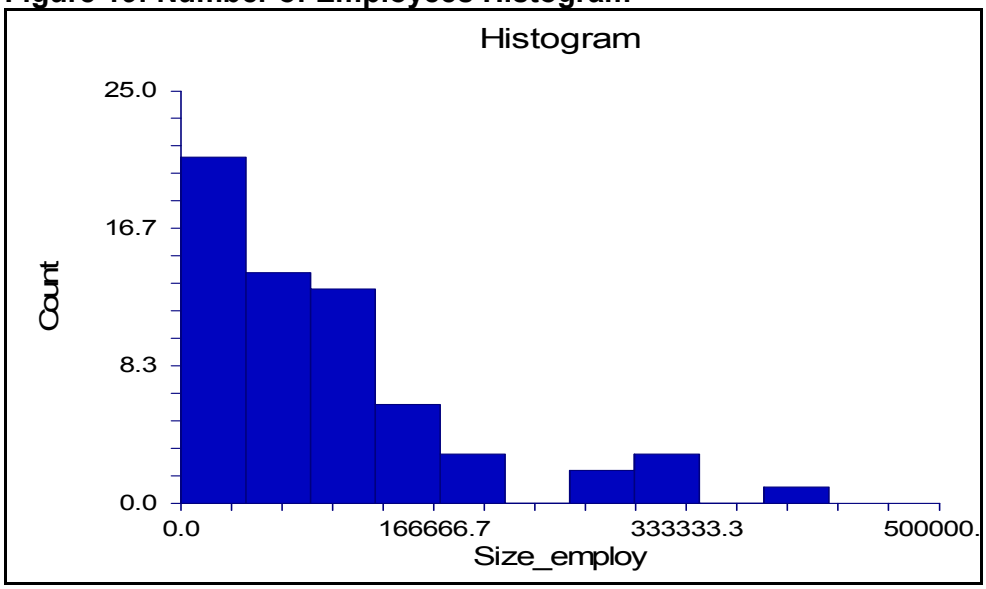


Table 22 shows the frequency distribution for the control variable which measures the size of the company based on the number of employees.

Table 22: Frequency Distribution for Size_employ Variable

Size_employ	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
0 To 25000	11	11	17.46	17.46	|||||
25000 To 50000	12	23	19.05	36.51	||||||
50000 To 75000	7	30	11.11	47.62	|||
75000 To 100000	11	41	17.46	65.08	|||||
100000 To 125000	7	48	11.11	76.19	|||
125000 To 150000	6	54	9.52	85.71	||
175000 To 200000	1	55	1.59	87.30	|
200000 To 225000	2	57	3.17	90.48	|
250000 To 275000	1	58	1.59	92.06	|
275000 To 300000	1	59	1.59	93.65	|
300000 To 325000	2	61	3.17	96.83	|
325000 To 350000	1	62	1.59	98.41	|
425000 To 450000	1	63	1.59	100.00	|

From this information it is clear that 41 of the 63 MNCs that participated in the study have less than 100,000 employees working for the firm. Also, only nine firms have more than 175,000 employees. Five of these nine firms are automobile manufacturers with labour intensive global manufacturing operations.

Testing the variables for statistically significant differences based on the "Size_employ" control variable using the MANOVA test yielded no statistically significant results. The results of the independent variables therefore do not differ based on the size of the company, measured as the number of employees working for the firm.

5.5.5 Company Size – Annual Turnover (Size_turnover)

Table 23 shows the descriptive statistics for the control variable which measures the size of each participating company based its annual turnover (in millions US dollars).

Table 23: Size Measured in Annual Turnover Descriptive Statistics

Variable	Count	Mean	Median	Min	Max
Size_turnover (million US$)	63	45,019.33	25,733.91	0.79	362,064.00

From this information we can conclude that the mean annual turnover for the participating companies is $45,019 million. The annual company turnover, however, varies across quite a significant range, with the minimum annual turnover at $734 thousand and the maximum annual turnover at $362,064 million.

Figure 20 shows the size distribution for the annual turnover of the participating firms.

Figure 20: Annual Turnover Histogram

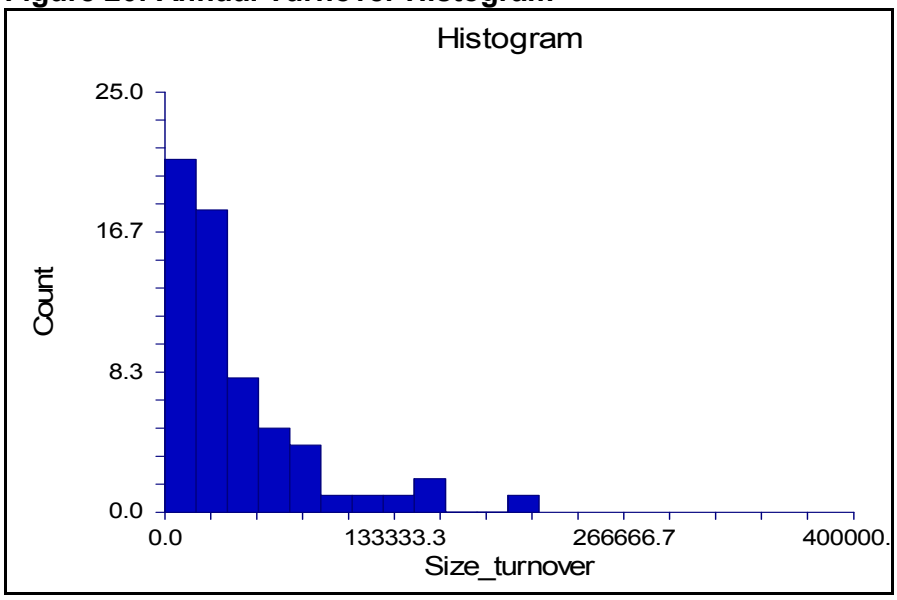


Table 24 shows the frequency distribution for the control variable which measures the size of the company based on its annual turnover (in millions US dollars).

Table 24: Frequency Distribution for Size_turnover Variable

Size_turnover	Count	Cumulative Count	Percent	Cumulative	Graph of Percent
0 To 20000	23	23	36.51	36.51	||||||||||||||
20000 To 40000	18	41	28.57	65.08	|||||||||||
40000 To 60000	9	50	14.29	79.37	|||||
60000 To 80000	4	54	6.35	85.71	||
80000 To 100000	2	56	3.17	88.89	|
100000 To 120000	2	58	3.17	92.06	|
120000 To 140000	1	59	1.59	93.65	|
140000 To 160000	1	60	1.59	95.24	|
160000 To 180000	1	61	1.59	96.83	|
200000 To 220000	1	62	1.59	98.41	|
360000 To 380000	1	63	1.59	100.00	|

65% of MNCs therefore earn less than $40 billion per annum. The independent variables were tested for statistically significant differences between them based on the "Size_turnover" control variable using the MANOVA test. This, however, yielded no statistically significant results.

5.6 Hypothesis Testing

Within this section the various hypotheses as outlined in Section 3 of this document are tested and analysed using:

- Correlation,
- Regression Analysis and
- T-tests

The first section evaluates the correlation between the various composite and independent variables:

5.6.1 Correlation Summary

Table 25 on the next page summarises the correlation between the various variables and tests the statistical significance of the relationships by means of the Pearson correlation analysis.

Table 25: Variable Correlation Matrix

		SubAutonomy	Cooperation	Competition	Coopetition	Rent	Dom_MS_Incr	Glob_ROS_Incr	Yrs_in_country	Size_employ	Size_turnover
SubAutonomy	Pearson Correlation	1									
	Sig. (2-tailed)	0.000									
	N	56									
Cooperation	Pearson Correlation	0.392**	1								
	Sig. (2-tailed)	0.003	0.000								
	N	56	56								
Competition	Pearson Correlation	-0.131	0.036	1							
	Sig. (2-tailed)	0.336	0.794	0.000							
	N	56	56	56							
Coopetition	Pearson Correlation	0.127	0.594**	0.813**	1						
	Sig. (2-tailed)	0.353	0.000	0.000	0.000						
	N	56	56	56	56						
Rent	Pearson Correlation	0.497**	0.39**	-0.274*	-0.011	1					
	Sig. (2-tailed)	0.000	0.003	0.041	0.933	0.000					
	N	56	56	56	56	56					
Dom_MS_Incr	Pearson Correlation	0.125	0.522**	0.019	0.355**	-0.001	1				
	Sig. (2-tailed)	0.357	0.000	0.888	0.007	0.994	0.000				
	N	56	56	56	56	56	56				
Glob_ROS_Incr	Pearson Correlation	0.134	-0.183	-0.03	-0.126	-0.014	0.081	1			
	Sig. (2-tailed)	0.323	0.177	0.827	0.356	0.918	0.551	0.000			
	N	56	56	56	56	56	56	56			
Yrs_in_country	Pearson Correlation	-0.219	0.027	0.233	0.204	-0.037	0.123	0.205	1		
	Sig. (2-tailed)	0.104	0.846	0.085	0.132	0.785	0.365	0.129	0.000		
	N	56	56	56	56	56	56	56	56		
Size_employ	Pearson Correlation	-0.233	0.055	0.25	0.229	-0.091	0.174	0.071	0.473**	1	
	Sig. (2-tailed)	0.085	0.687	0.063	0.090	0.503	0.198	0.604	0.000	0.000	
	N	56	56	56	56	56	56	56	56	56	
Size_turnover	Pearson Correlation	-0.251	-0.194	0.313*	0.072	-0.164	-0.128	0.107	0.222	0.601**	1
	Sig. (2-tailed)	0.062	0.151	0.019	0.600	0.226	0.348	0.433	0.099	0.000	0.000
	N	56	56	56	56	56	56	56	56	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

From this table we can conclude that there is a statistically significant relationship between the following variables (see Table 26):

Table 26: Statistically Significant Correlation Summary

Variable 1	Variable 2	Pearsons Correlation	Sig. (2-tailed)	Significant at 0.01 level	Significant at 0.05 level
SubAutonomy	Cooperation	0.392	0.003	Yes	Yes
SubAutonomy	Rent	0.497	0.000	Yes	Yes
Cooperation	Coopetition	0.594	0.000	Yes	Yes
Cooperation	Rent	0.390	0.003	Yes	Yes
Cooperation	Dom_MS_Incr	0.522	0.000	Yes	Yes
Competition	Coopetition	0.813	0.000	Yes	Yes
Competition	Rent	-0.274	0.041	No	Yes
Competition	Size_turnover	0.313	0.019	No	Yes
Coopetition	Dom_MS_Incr	0.355	0.007	Yes	Yes
Size_employ	Yrs_in_country	0.473	0.000	Yes	Yes
Size_employ	Size_turnover	0.601	0.000	Yes	Yes

From this table it is clear that subsidiary autonomy showed a statistically significant positive correlation to inter-subsidiary cooperation at the 99% confidence interval. Since headquarter control is the inverse of subsidiary autonomy, we can conclude that headquarter control showed a statistically significant negative correlation with inter-subsidiary cooperation. Similarly, we can conclude that rent-seeking behaviour showed a statistically significant negative correlation to headquarter control at the 99% confidence interval.

Both cooperation and competition showed a statistically significantly positive correlation to coopetition. This is, however, in line with expectations since coopetition is calculated from these two variables

(Coopetition = $\sqrt{(\text{Cooperation} * \text{Competition})}$). Both cooperation and coopetition showed a statistically significant positive correlation to domestic market share increase at the 99% confidence interval. An initial indication that cooperation and coopetition are positively correlated to the domestic performance of the MNC subsidiary. Cooperation showed a highly significant positive correlation to rent-seeking behaviour.

At the 95% confidence interval, inter-subsidiary competition showed a negative correlation to rent-seeking behaviour and a positive correlation to company size (measured in annual global turnover). Competition between subsidiaries for limited resources therefore seems to become more intense as the company's size increase.

As one would expect there is also a statistically significant positive relationship between the company size in terms of the number of employees and both:

- the company size in terms of the company's annual turnover and
- the number of years the company has been operating within South Africa.

The next section evaluates the relationship between headquarter control, inter-subsidiary cooperation and rent-seeking behaviour which is analysed through hypothesis 1 (see Section 3).

5.6.2 Regression Analysis: Hypothesis 1

Hypothesis 1 analyses the impact of headquarter control and inter-subsidiary cooperation on rent-seeking behaviour within subsidiaries. A multiple regression was used to test this model. The underlying assumptions when using a multiple regression are:

- Normality,
- Independence (Independent Errors),
- Linearity and
- Constant Variance.

The assumptions for using a regression model to analyse the data is confirmed in Table 27.

Table 27: Regression Model Assumptions Test Section

Assumptions	Test	Test Value	Prob Level	Reject H0
Normality	Shapiro Wilk	0.9897	0.8769	No
	Anderson Darling	0.2207	0.8334	No
	D'Agostino Skewness	0.1094	0.9129	No
	D'Agostino Kurtosis	0.6856	0.4929	No
	D'Agostino Omnibus	0.4821	0.7858	No
Independence	Based on the Serial Correlation and Durbin Watson tests there is no significant serial correlation in the model			
Linearity	Residual vs. Predictor Plots indicate linear relationship			
Constant Variance	Residual vs. Predicted Plots indicates non-constant variance			

Table 28 summarises the results of the multiple regression model which analyse the impact of headquarter control and inter-subsidiary cooperation on rent-seeking behaviour. The table also includes the statistical significance of each of the variables and the overall

significance of the model. The full regression results are included in *Appendix D*.

Table 28: Regression Analysis Results for Rent-Seeking Model

Regression Equation Section	Unstandardised Beta	Standard Error	t-value	Probability Level	Reject H0 at 5%
Intercept	0.8861	0.8364	1.0590	0.2944	No
Cooperation	0.2507	0.1515	1.6550	0.1041	No
(HQ="JPN")	0.2648	0.4871	0.5440	0.5890	No
(HQ="NA")	0.2562	0.2947	0.8690	0.3888	No
(Industry="HRIM")	0.4696	0.7057	0.6650	0.5088	No
(Industry="KIS")	0.3010	0.6411	0.4700	0.6407	No
(Industry="MHRIM")	-0.3121	0.4525	-0.6900	0.4936	No
(Industry="MLRIM")	-0.1461	0.5104	-0.2860	0.7759	No
Size_employ	0.0000	0.0000	0.0000	1.0000	No
Size_turnover	0.0000	0.0000	0.0000	1.0000	No
SubAutonomy	**0.3282**	**0.1032**	**3.1790**	**0.0025**	**Yes**
Yrs_in_country	0.0012	0.0045	0.2630	0.7933	No
Model Summary	**R**	**R^2**	**Adjusted R^2**	**Mean Square Error**	**Square Root of MSE**
	0.6560	0.4304	0.3076	0.9128	0.9554
ANOVA	**Sum of squares**	**df**	**Mean square**	**F-value**	**Prob. Level**
Regression	35.1828	11	3.1984	3.5040	0.0011
Residual	46.5523	51	0.9128		
Total	81.7352	62			

Significant at the 0.1 level
Significant at the 0.05 level
Significant at the 0.01 level

From *Table* 28 it is clear that:

- Based on the adjusted R^2 value, 30.76% of the variance in Rent-seeking behaviour is explained by changes in subsidiary autonomy (or headquarter control) and inter-subsidiary cooperation.
- The high F-Ratio (3.5040>3) and high significance level (0.001<0.01) are indications of a strong regression result (Albright *et al.*, 2005).

- Subsidiary Autonomy (SubAutonomy) has statistically significant descriptive power at the 0.01 level (99% confidence interval) on the dependent variable (Rent-seeking behaviour) as seen through its high t-value (3.179) and high significance level (0.0025<0.01).
- Although inter-subsidiary cooperation (Cooperation) does not have statistically significant descriptive power within the model, it still has a relatively high t-value (1.655) and is still marginally significant if rounded to two decimals (0.1041≈0.1).

Since none of the control variables seemed to have any statistically significant descriptive power within the model, the next calculation excluded these variables from the analysis. This multiple regression yielded the following results (see Table 29):

Table 29: Regression Analysis for Rent-Seeking Model (Excl. Control Variables)

Regression Equation Section	Unstandardised Beta	Standard Error	t-value	Probability Level	Reject H0 at 5%
Intercept	0.6383	0.6025	1.0590	0.2937	No
Cooperation	***0.2789***	***0.1303***	***2.1400***	***0.0364***	***Yes***
SubAutonomy	**0.3527**	**0.0824**	**4.2800**	**0.0001**	**Yes**
Model Summary	**R**	**R^2**	**Adjusted R^2**	**Mean Square Error**	**Square Root of MSE**
	0.6305	0.3975	0.3775	0.7911	0.8894
ANOVA	**Sum of squares**	**df**	**Mean square**	**F-value**	**Prob. Level**
Regression	31.3204	2	15.6602	19.7950	0.0000
Residual	47.4664	60	0.7911		
Total	78.7868	62			

Significant at the 0.1 level
Significant at the 0.05 level
Significant at the 0.01 level

From *Table* 29 it is clear that:

- Based on the adjusted R^2 value, which accounts for the sample size and number of variables, 37.75% of the variance in Rent-seeking behaviour is explained by the model (compared to 30.76% for the previous model which also included the control variables).
- The model has an extremely high F-Ratio (19.795>3) and high significance level (0.0000 < 1%) which are indications of a very strong regression result (Albright *et al.*, 2005).
- Both subsidiary autonomy (SubAutonomy) and inter-subsidiary cooperation (Cooperation) has statistically significant descriptive power on the dependent variable (rent-seeking behaviour). Subsidiary autonomy is, however, statistically significant at the 99% confidence interval with a t-value of 4.28, whilst inter-subsidiary cooperation is at the 95% confidence interval with a t-value of 4.28.

There is therefore strong evidence to suggest that both aubsidiary autonomy (headquarter control) and inter-subsidiary cooperation have statistically significant descriptive power over rent-seeking behaviour.

The estimated model to calculate rent-seeking behaviour is:

Rent = 0.6383+ 0.27885*Cooperation + 0.3527*SubAutonomy

5.6.3 Regression Analysis: Hypothesis 2

Hypothesis 2 analyses the impact of:

- Rent-seeking behaviour,
- Subsidiary autonomy (or headquarter control),
- Inter-subsidiary cooperation,
- Inter-subsidiary competition and
- Inter-subsidiary coopetition

on MNC performance, measured by the:

- Increase in domestic market share of the subsidiary (perceptual measure) and the
- Increase in global return on shareholder funds (%) for the MNC (objective measure).

A multiple regression is used to test the theoretical model detailed above (also see Section 3: Hypothesis 2), whilst the control variables listed in Table 4 are also included in the analysis. The full regression results are included in *Appendix D*. Table 30 confirms the assumptions for the regression model:

Table 30: Regression Model Assumptions Test Section

Assumptions	Test
Normality	Normality confirmed - *see Section 5.4 and see Appendix F*
Independence	Based on the Serial Correlation and Durbin Watson tests there is no significant serial correlation in the model
Linearity	Residual vs. Predictor Plots indicate linear relationship
Constant Variance	Residual vs. Predicted Plots indicates non-constant variance

The first regression model analyses the perceptual dependent variable measure – increase in domestic market share.

5.6.3.1 Increase in Domestic Market Share (Perceptual Measure)

The result of the regression analysis is shown in Table 31. The table includes the statistical significance of each variable and the overall significance of the model.

Table 31: Regression Analysis Results for Perceptual MNC Performance Model

Regression Equation Section	Unstandardised Beta	Standard Error	t-value	Probability Level	Reject H0 at 5%
Intercept	**2.9226**	**0.9365**	**3.1210**	**0.0031**	**Yes**
Competition	**-2.8423**	**0.7868**	**-3.6120**	**0.0007**	**Yes**
Cooperation	-0.9969	0.6044	-1.6500	0.1056	No
Coopetition	**4.3569**	**1.3065**	**3.3350**	**0.0017**	**Yes**
(HQ="JPN")	**-2.1564**	**0.4758**	**-4.5320**	**0.0000**	**Yes**
(HQ="NA")	0.0046	0.2980	0.0160	0.9876	No
(Industry="HRIM")	0.1096	0.6544	0.1670	0.8677	No
(Industry="KIS")	-0.2205	0.6896	-0.3200	0.7506	No
(Industry="MHRIM")	0.0615	0.4428	0.1390	0.8901	No
(Industry="MLRIM")	0.0329	0.4951	0.0660	0.9473	No
Rent	*-0.2394*	*0.1307*	*-1.8310*	*0.0733*	*No*
Size_employ	0.0000	0.0000	0.0000	1.0000	No
Size_turnover	0.0000	0.0000	0.0000	1.0000	No
SubAutonomy	-0.0234	0.1079	-0.2170	0.8291	No
Yrs_in_country	0.0009	0.0044	0.1950	0.8461	No
Model Summary	**R**	**R^2**	**Adjusted R^2**	**Mean Square Error**	**Square Root of MSE**
	0.8279	0.6855	0.5937	0.7697	0.8773
ANOVA	**Sum of squares**	**df**	**Mean square**	**F-value**	**Prob. Level**
Regression	80.5156	14	5.7511	7.4720	0.0000
Residual	36.9446	48	0.7697		
Total	117.4603	62			

From Table 31 it is clear that:

- Based on the adjusted R^2 value, 59.37% of the variance in domestic market share is explained by changes in each of the dependent variables listed above. This is exceptionally high R^2-value and a strong indication that the model has a high goodness-of-fit to the independent variable.
- The high F-Ratio (7.472 > 3) and subsequent high significance level (0.0000 < 5%) are also indications of an extremely strong regression result (Albright *et al.*, 2005).
- Inter-subsidiary competition has statistically significant descriptive power at the 0.01 level (99% confidence interval) on the dependent variable (domestic market share increase) and seen through its high t-value (-3.612) and a high significance level (0.0007<0.01). The Beta value is, however, negative (-2.8423) which indicates that inter-subsidiary competition is negatively correlated to MNC performance within the model.
- Similarly, inter-subsidiary coopetition has statistically significant descriptive power at the 0.01 level (99% confidence interval). The variable's t-value is also high (3.335) which results in a high significance level (0.0017<0.01). The Beta value is positive (4.6539) – an indication that inter-subsidiary coopetition has a strong positive correlation to MNC performance within the regression model.
- Subsidiaries with headquarters in Japan, showed a statistically significant (at the 99% confidence interval) negative beta value of -2.1564, compared to firms from Europe.

- Industry does, however, not have any statistically significant impact on domestic market share increase.
- Rent-seeking behaviour also has a statistically significant negative impact on domestic market share increase, with a beta value of -0.2394. The t-value is, however, only -1.8310 and the result is therefore only marginally significant at the 90% confidence interval.
- Another factor worth mentioning is Cooperation, which was not statistically significant at 90% confidence interval, but is, however, at 89% with a t-value of -1.65. The Beta value of inter-subsidiary cooperation is also negative (-0.9969).

There is therefore strong evidence to suggest that: Competition, Coopetition, Rent-seeking behaviour and to a lesser extent Cooperation have statistically significant descriptive power over MNC performance (measured by domestic market share increase – a perceptual measure).

The estimated model to calculate MNC performance is therefore:

Dom_MS_Incr = 2.9226 - 2.8422*Competition - 0.9969*Cooperation + 4.3569*Coopetition - 2.1563*(HQ="JPN") + 4.6428E-03*(HQ="NA") + 0.1096*(Industry="HRIM") - 0.2205*(Industry="KIS") + 6.1506E-02*(Industry="MHRIM") + 3.2893E-02*(Industry="MLRIM") - 0.2394*Rent + 2.1225E-06*Size_employ + 2.8880E-06*Size_turnover - 2.3422E-02*SubAutonomy + 8.5646E-04*Yrs_in_country

The next regression model analyses the impact of the same independent variables on the objective dependent variable – increase in global return on shareholder funds (%). Analysing the same model using an objective measure allows us to compare and confirm the results of the model that used the subjective measure for MNC performance.

The expectation is, however, that the results of the objective measure will have more limited statistical significance since:

- There are various other factors, not included in the model, which have a significant impact on global MNC performance, for example:
  - Commodity prices (especially the oil price),
  - Exchange rates,
  - Economic growth rates (especially for the major markets of each MNC),
  - Other industry specific factors like the maturity of the industry (industry life-cycle stage),
  - Etc.

Even considering these limitations it is still a good idea to include the objective measure since it will assist to confirm the predictive validity of the initial (perceptual) regression model.

5.6.3.2 Increase in Global Return on Shareholder Funds (Objective Measure)

The result of the regression analysis for hypothesis 2 which measures the impact of the independent variables (see Section 5.6.3) on the objective MNC performance measure (increase in global return on shareholder funds) is shown in Table 32:

Table 32: Regression Analysis Results for Objective MNC Performance Model

Regression Equation Section	Unstandardised Beta	Standard Error	t-value	Probability Level	Reject H0 at 5%
Intercept	-5.3594	37.5264	-0.1430	0.8871	No
Competition	-28.8827	31.8317	-0.9070	0.3695	No
Cooperation	-29.3857	24.9676	-1.1770	0.2460	No
Coopetition	43.0639	53.2947	0.8080	0.4237	No
(HQ="JPN")	-0.6417	18.4179	-0.0350	0.9724	No
(HQ="NA")	15.9482	12.3085	1.2960	0.2023	No
(Industry="HRIM")	*52.8664*	*26.3634*	*2.0050*	*0.0516*	*No*
(Industry="KIS")	7.9718	27.4097	0.2910	0.7726	No
(Industry="MHRIM")	28.7790	18.7718	1.5330	0.1329	No
(Industry="MLRIM")	18.3743	20.8045	0.8830	0.3823	No
Rent	-2.2120	4.7475	-0.4660	0.6437	No
Size_employ	-0.0001	0.0000	0.0000	1.0000	No
Size_turnover	0.0002	0.0000	0.0000	1.0000	No
SubAutonomy	***10.7011***	***4.4861***	***2.3850***	***0.0218***	***Yes***
Yrs_in_country	*0.3564*	*0.1901*	*1.8750*	*0.0679*	*No*
Model Summary	**R**	**R^2**	**Adjusted R^2**	**Mean Square Error**	**Square Root of MSE**
	0.4922	0.2423	0.0000	1147.5790	33.8759
ANOVA	**Sum of squares**	**df**	**Mean square**	**F-value**	**Prob. Level**
Regression	15043.8100	14	1074.5570	0.9360	0.5302
Residual	47050.7500	41	1147.5790		
Total	62094.5600	55			

From Table 32 it is clear that:

- The adjusted R^2 value indicates a weak regression result.
- The F-Ratio (0.936) also indicates a weak regression result (Albright *et al.*, 2005).
- Only subsidiary autonomy has statistically significant descriptive power at the 0.01 level, with a positive beta value of 10.7011 and a t-value of 2.385.
- Similarly, the "years in country" and "high research intensive manufacturing industry" variables have statistically significant results at the 10% significance level (90% confidence interval). The Beta values for these variables are also both positive.

When we, however, compare the results of the objective MNC performance measure (Table 32) to those of the subjective measure (Table 31), we find that the direction of the Beta values for both measures are mostly in the same direction. Table 33 below compares these Beta values.

Table 33: Beta: Perceptual vs. Objective Measure Comparison

Beta: Perceptual vs. Objective Measure Comparison	Unstandardised Beta		Same Beta Direction
	Perceptual	Objective	
	Dom_MS_Incr	Glob_ROS_Incr	
Intercept	**2.9226**	-5.3594	Yes
Competition	**-2.8423**	-28.8827	Yes
Cooperation	-0.9969	-29.3857	Yes
Coopetition	**4.3569**	43.0639	Yes
(HQ="JPN")	**-2.1564**	-0.6417	Yes
(HQ="NA")	0.0046	15.9482	Yes
(Industry="HRIM")	0.1096	*52.8664*	Yes
(Industry="KIS")	-0.2205	7.9718	No
(Industry="MHRIM")	0.0615	28.7790	Yes
(Industry="MLRIM")	0.0329	18.3743	Yes
Rent	*-0.2394*	-2.2120	Yes
SubAutonomy	-0.0234	***10.7011***	No
Yrs_in_country	0.0009	*0.3564*	Yes

Significant at the 0.1 level
Significant at the 0.05 level
Significant at the 0.01 level

Therefore, the regression models for both the perceptual (increase in domestic market share) and the objective (increase in global return on shareholder funds) performance measures indicate that most independent variables have the same directional impact on the performance measures (MNC performance). The only two variables that have different signs before their Beta values are:

- Knowledge intensive services industry and
- Subsidiary autonomy.

5.6.4 Summary of Hypotheses Results

Table 34 summarises the final testing results for the hypotheses listed in Section 3.

Table 34: Hypotheses Testing Results

Hypothesis	Description	Test Variable	Statistical Support for Hypothesis	Independent Variable Impact on y	Probability
1.1	MNCs with higher levels of headquarter control will have either higher or lower levels of rent-seeking behaviour within the firm.	x = SubAutonomy; y = Rent	Yes	Positive	0.0001
1.2	MNCs with higher levels of cooperation between subsidiaries will have lower levels of rent-seeking behaviour within the firm.	x = Cooperation; y = Rent	No	Positive	0.0364
2.1	MNCs with high levels of rent-seeking behaviour perform worse than MNCs with low levels of rent-seeking behaviour.	x = Rent; y = Dom_MS_Incr	Yes	Negative	0.0733
2.2	MNCs with high levels of headquarter control perform either better or worse than MNCs with lower levels of headquarter control.	x = SubAutonomy; y = Glob_ROS_Incr	Yes	Negative	0.0218
2.3	MNCs with high levels of inter-subsidiary cooperation perform better than MNCs with lower levels of inter-subsidiary cooperation.	x = Cooperation; y = Dom_MS_Incr	No	Negative	0.1056
2.4	MNCs with high levels of competition between subsidiaries perform worse than MNCs with lower levels of competition between their subsidiaries.	x = Competition; y = Dom_MS_Incr	Yes	Negative	0.0007
2.5	MNCs with high levels of both cooperation and competition (coopetition) between subsidiaries perform better than MNCs with lower levels of coopetition between its subsidiaries.	x = Coopetition; y = Dom_MS_Incr	Yes	Positive	0.0017

From this table, it is clear that each of the hypotheses delivered a statistically significant result at the 5% level, except for hypotheses 2.1 and 2.3. There is therefore a statistically significant relationship between the variables described in hypotheses 1.1, 1.2, 2.2, 2.4 and 2.5 at the 5% significance level. The directional impact of each of the independent (x) variables on the dependent (y) variables is shown in the second last

column in Table 34. From this information it is clear that the directional impact of the relationships is different for hypotheses 1.2 and 2.3 than originally anticipated.

6 Discussion of Results

The research set out firstly to understand the relationship between inter-subsidiary cooperation, headquarter control (or subsidiary autonomy) and rent-seeking behaviour within a MNC. Hypothesis 1 analysed this relationship. The second objective of the research was to evaluate and understand the link between headquarter control, inter-subsidiary cooperation, competition, coopetition, rent-seeking behaviour and MNC performance where MNC performance was measured through both a perceptual (increase in domestic market share) and an objective (increase in global return on shareholder funds) measure.

The results of this research study provide new insight into global business strategy for multinational corporations with subsidiaries that operate on the periphery of the global economy and more specifically within South Africa.

Herewith follows a detailed discussion of these results:

6.1 Hypothesis 1: Rent-seeking Behaviour Model

As mentioned, hypothesis 1 analysed the relationship and impact of headquarter control (hypothesis 1.1) and inter-subsidiary cooperation (hypothesis 1.2) on rent-seeking behaviour within subsidiaries.

6.1.1 Hypothesis 1.1: Headquarter Control vs. Rent-seeking Behaviour

The study found strong evidence (see Section 5.6) to suggest that MNCs with higher levels of headquarter control will have lower levels of rent-seeking behaviour within their subsidiaries. There is a statistically significant positive correlation between subsidiary autonomy and rent-seeking behaviour. The regression analysis (see Section 5.6.2) also confirmed this finding and determined that higher levels of subsidiary autonomy (or lower levels headquarter control) is correlated to an increase in rent-seeking behaviour.

These findings support the views of Foss *et al.* (2006) and Andersson *et al*. (2007), who found that an increase in headquarter control will constrain rent-seeking behaviour within MNCs. The findings, however, contradict the studies of Frey (1998) and Mudambi *et al.* (2004) which suggest that constant monitoring by headquarters may increase rent-seeking behaviour and opportunistic behaviour by subsidiary managers.

It is evident from the research the headquarter control (or subsidiary autonomy) levels do not vary across various industries and research intensity levels. Nor does the size of the company affect the level of headquarter control within the firm. It, however, seems that firms which have operated in South Africa for less than eight years tend to provide more autonomy to their subsidiaries during the start-up phase. This may be because of the parent firms' initial limited knowledge and

understanding of the local market conditions within the country. The MNC headquarters is therefore dependent on its local subsidiary to seize local market opportunities (Luo, 2003). These firms therefore try and maximise market opportunity by providing local subsidiaries with the necessary leverage and strategic flexibility to compete effectively within the local market.

6.1.2 Hypothesis 1.2: Inter-subsidiary Cooperation vs. Rent-seeking

Based on the research findings, there is no statistically significant support for hypothesis 1.2. The research did, however, find a strong positive correlation between inter-subsidiary cooperation and rent-seeking behaviour. Based on the regression analysis model (see Section 5.6.2), inter-subsidiary cooperation is significantly positively correlated to rent-seeking behaviour. Although this does not provide concrete evidence to prove causality, these findings do suggest that MNCs with higher levels of cooperation between subsidiaries will have higher levels of rent-seeking behaviour within their firm.

Interestingly, this finding contradicts most of the previous research within this field. Researchers agree that intrinsic motivation reduces rent-seeking behaviour within firms (Osterloh *et al.*, 2000 and Mudambi et al., 2004). According to Mudambi *et al.* (2004), inter-subsidiary cooperation improves intrinsic motivation levels which therefore suggest that greater inter-subsidiary cooperation should decrease rent-seeking behaviour

within the subsidiaries of the MNC. Based on the findings of this study, however, the counter argument is true. This difference can be explained through various possible causes:

Regional specific factors may influence the assumptions mentioned above. In other words, since this study was conducted only on South African firms, the assumptions may not hold true regarding the links between:

- Intrinsic motivation and rent-seeking behaviour (Osterloh *et al.*, 2000 and Mudambi *et al.*, 2004) and/or
- Intrinsic motivation and inter-subsidiary cooperation (Mudambi *et al.*, 2004) and/or
- Subsidiary bargaining power and rent-seeking behaviour (Mudambi *et al*., 2004).

The Mudambi *et al*. (2004) study was conducted on subsidiaries operating in the United Kingdom, which is part of the Triad of the global economy, where subsidiaries receive higher levels of foreign direct investment (FDI) and research and development investment from its parent company (Narula and Sadowski, 2002; Benito and Narula, 2007). South African subsidiaries, however, operate on the periphery of the global economy, where rent-seeking behaviour is possibly higher than in subsidiaries which operate within the Triad of the global economy. A subsidiary on the periphery probably has to engage more in rent-seeking behaviour, than its counterparts that operate within the Triad, to get

some attention and resources from its parent company. This raises a few interesting question that represents an opportunity for future research.

Alternatively, there may be other factors, not included in this analysis, that have a greater impact on rent-seeking behaviour within subsidiaries. It is, however, important to note that the research found a strong statistically significant positive correlation between inter-subsidiary cooperation and rent-seeking behaviour.

A final possible explanation is that the assumptions explained in the literature review are incorrect. The previous researchers may therefore have excluded some important factors from their analysis:

- The link between inter-subsidiary cooperation and intrinsic motivation as reported by Mudambi *et al*. (2004) may not be an accurate assumption and/or
- The link between the level of rent-seeking behaviour and the level of subsidiary bargaining power described in Section 2.4.1. may not be accurate, and/or
- The findings from Osterloh *et al.* (2000) that intrinsic motivation reduces rent-seeking behaviour within firms may not be accurate.

6.2 Hypothesis 2: MNC Performance Model

As detailed in Section 3, hypothesis 2 analysed the relationship and impact of rent-seeking behaviour (hypothesis 2.1), headquarter control (hypothesis 2.2), inter-subsidiary cooperation (hypothesis 2.3), inter-subsidiary competition (hypothesis 2.4) and inter-subsidiary coopetition (hypothesis 2.5) on MNC performance. MNC performance was measured through both a perceptual (increase in domestic market share) and an objective measure (increase in global return on shareholder funds). Herewith follows a discussion of the results of this analysis:

6.2.1 Hypothesis 2.1: Rent-seeking Behaviour vs. MNC Performance

Based on the regression analysis there is statistically significant support for hypothesis 2.1 at the 10% level. Although the correlation and regression analysis does not necessarily prove causality, the research findings seem to support the statement that: MNCs with low levels of rent-seeking behaviour perform better than MNCs with higher levels of rent-seeking behaviour. The regression model (see Section 5.3) for both the perceptual and objective measures calculated a negative beta-value for rent-seeking behaviour. Although only the first measure was statistically significant at the 90% confidence interval, it still provides enough evidence to conclude that there is a marginally significant negative correlation between rent-seeking behaviour and MNC performance (measured by domestic market share growth).

This conclusion supports findings from previous researchers like: Scharfstein *et al.* (2000); Mudambi *et al.* (2004); and Foss *et al.* (2006). We can therefore conclude that the findings of the study support the literature that suggests that rent-seeking behaviour destroys shareholder value, since it leads to a sub-optimal performance for the MNC because of resource misallocations to underperforming subsidiaries within the MNC.

6.2.2 Hypothesis 2.2: Headquarter Control vs. MNC Performance

The regression model which analysed the impact of amongst others subsidiary autonomy (or headquarter control) on the objective dependent variable measure of MNC performance (increase in global return on shareholder funds); found a statistically significant positive correlation between subsidiary autonomy and MNC performance. Based on the research findings there is therefore strong evidence to suggest that higher levels of headquarter control will lead to lower levels of global MNC performance.

This finding contradicts the views of Andersson *et al.* (2007) as described in Section 2, but supports the views of most other researchers that greater subsidiary autonomy has a net positive impact on MNC performance (Rugman *et al.*, 2001; Andersson *et al.*, 2002; Luo, 2003; Mudambi *et al.*, 2004; Bouquet *et al.*, 2008; Yu *et al.*, 2009). A global business strategy that provides subsidiaries with the necessary

autonomy and strategic flexibility to make business decisions based on their local market conditions therefore has a net positive impact on global business performance.

One concern with this finding is that the perceptual performance measure of MNC performance (increase in domestic market share) did not find any statistically significant evidence to support this finding. This may possibly be attributable to the limited sample size of the study. Alternatively, although subsidiary autonomy has a statistically significant positive impact on the global return on shareholder funds (objective measure) for the MNC, an increase in subsidiary autonomy may not necessarily have a statistically significant impact on the domestic market share (perceptual measure) of the local subsidiary. Greater subsidiary autonomy therefore probably rather impacts on other performance measures like profitability and ROI (return on investment) which then ultimately improves the global return on shareholder funds for the global MNC.

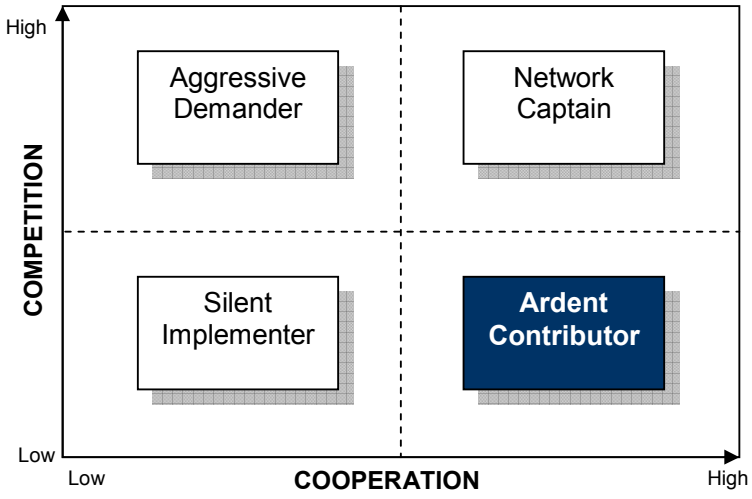
6.2.3 Hypothesis 2.3: Inter-subsidiary Cooperation vs. MNC Performance

With the results of this analysis it is important to consider the entire model used within the analysis. When inter-subsidiary cooperation is considered in isolation (excluding competition and coopetition), it has a statistically significant positive correlation with the perceptual measure of

MNC performance (domestic market share growth). However, within the regression model (see Section 5.6.3) both competition and coopetition are included as independent variables. Within this model, inter-subsidiary cooperation has a statistically significant negative impact on MNC performance at the 89% confidence interval. The objective measure's regression analysis also supports this finding since it also calculated a negative beta value for cooperation, although this result was not statistically significant. Based on the analysis there is therefore no statistically significant evidence to support hypothesis 2.3.

Therefore, MNCs that have high levels of inter-subsidiary cooperation and low levels of inter-subsidiary competition (ardent contributors – see Figure 21) seem to perform worse than MNCs with low levels of both inter-subsidiary cooperation and competition (silent implementers – see Figure 21). Based on this analysis, inter-subsidiary cooperation on its own does not drive business performance and may even harm business performance.

Figure 21: Low Competition and High Cooperation Level



Source: Luo (2005)

This result contradicts the findings of authors like Ambos *et al.* (2006) who focus only on subsidiary cooperation as the singular element that drives MNC performance. This result, however, support the findings of authors like Luo (2005); Luo *et al.* (2006) and Ross *et al.* (2007) who all identify the inter-relationship of competitive as well as cooperative elements within inter-subsidiary business relationships and the crucial role it plays in driving business performance.

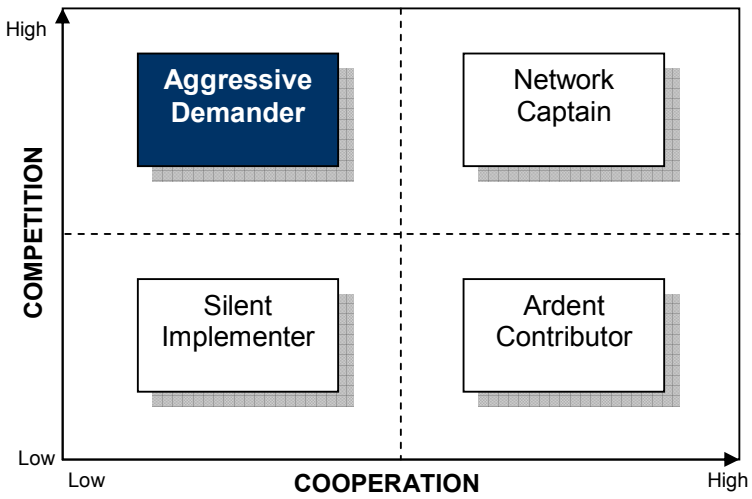
6.2.4 Hypothesis 2.4: Inter-subsidiary Competition vs. MNC Performance

Similarly, the results for hypothesis 2.4 considered not only inter-subsidiary competition, but also inter-subsidiary cooperation and coopetition. The research found statistically significant evidence to

support hypothesis 2.4. The regression model (see Section 5.6.3) found that inter-subsidiary competition has a statistically significant negative correlation to MNC performance at the 99% confidence interval. This calculation considered the perceptual performance measure of MNC performance - domestic market share increase. The objective performance measure, although not statistically significant, supports this finding since its beta-value is also negative.

Therefore, the subsidiaries of MNCs that have high levels of inter-subsidiary competition and low levels of inter-subsidiary cooperation (aggressive demanders – see Figure 22) perform worse than MNCs with low levels of both inter-subsidiary cooperation and competition (silent implementers – see Figure 22). Therefore inter-subsidiary competition on its own will harm MNC business performance.

Figure 22: High Competition and Low Cooperation Level



Source: Luo (2005)

Based on the correlation analysis (see Section 5.6.1), inter-subsidiary competition is positively correlated to the size of the MNC (measured in annual turnover). Larger MNCs therefore have higher levels of competition between their subsidiaries. This may be explained by the fact that a larger firm will have more subsidiaries competing for the same set of resources and attention from headquarters, which should lead to an increase in the perceived level of inter-subsidiary competition.

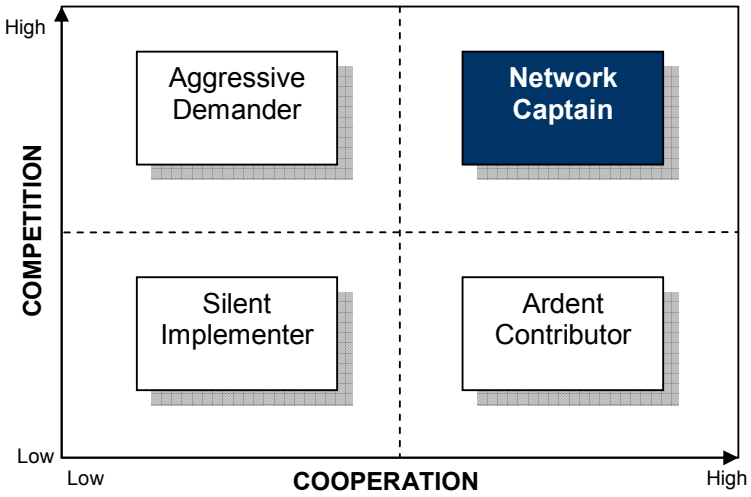
6.2.5 Hypothesis 2.5: Inter-subsidiary Coopetition vs. MNC Performance

The research found strong evidence in support of hypothesis 2.5. Inter-subsidiary coopetition, which is the combination of cooperation and competition, has a statistically significant positive impact on MNC business performance (measured by the perceptual measure of domestic market share increase). Based on the regression analysis (see Section 5.6.3) MNCs with high levels of coopetition between its subsidiaries perform better than MNCs with lower levels of either inter-subsidiary cooperation or competition. Therefore to maximise MNC performance both cooperation and competition is required.

Figure 23 depicts this ideal quadrant where MNCs should position their global business strategy to maximise business performance. Luo (2005) refers to these MNCs as “network captains”. It is, however, important to

note that a network captain will outperform all other quadrants, whilst a silent implementer will outperform both an aggressive demander and an ardent contributor (see Figure 23).

Figure 23: High Competition and High Cooperation Level



Source: Luo (2005)

This result supports the findings of Luo (2005) who found that an MNC's inter-subsidiary business strategy requires both cooperative and competitive elements to deliver exponential value. Luo *et al.* (2006) and Ross *et al.* (2007) also found that a firm requires both cooperation and competition to reach its full performance potential.

6.2.6 Control Variables and Concerns

Based on the perceptual measure of MNC performance (domestic market share growth), Japanese firms performed worse than its European and North American counterparts. This may be attributed to

the fact that four of the five Japanese firms included in this study are from the vehicle manufacturing industry. The vehicle manufacturing industry in South Africa recently had new competitors from China and India enter the market which eroded some of the market share of the more established Japanese firms. The objective MNC global performance measure did, however, not find any statistically significant difference in the performance of these Japanese firms which also supports the theory mentioned above.

The objective MNC performance measure (increase in global return on shareholder funds) found a statistically significant difference in MNC performance for the "high research intensive manufacturing" industry. Based on the regression analysis (see Section 5.6.3), firms from this industry outperformed firms from other industry sectors. No other control variables showed any statistically significant differences.

The regression analysis for the perceptual measure (increase in domestic marker share) delivered a strong regression result (see Section 5.6.3.1: Table 31) with a high F-value (7.47) and a high adjusted R^2 (59.37%). This is an indication that the majority of the variation in the perceptual measure is explained by the variation in the variables included in the study. The regression result for the objective measure (increase in global return on shareholder funds), however, delivered a relatively low F-value (0.936) and a subsequent weak regression result (see Section 5.6.3.2: Table 32).

This weak regression result is probably due to:

- The limited sample size and subsequent low degrees of freedom of the regression model and/or
- Other factors (variables) not included in the regression model, that have a substantial impact on the global performance of the MNC (measured through global return on shareholder funds). These factors are:
    - Commodity prices (especially the oil price),
    - Exchange rates,
    - Economic growth rates (especially for the major markets of each MNC),
    - Inflation and interest rates within the main markets of the MNC,
    - Other industry specific factors like the maturity of the industry (industry life-cycle stage),
    - Etc.

6.3 Other Results

6.3.1 Perceptual Performance Measure

The rating for the perceptual performance measure which requested respondents to rate their MNC's increase in domestic market share received a mean rating of 4.92 and a median rating of 5 (slightly agree). This may indicate some level of response bias, where the respondents showed a tendency to rate their firms' performance better than their actual performances.

Alternatively this may indicate that MNCs in general outperformed other local or smaller firms. A recent study on MNC performance within an emerging market economy (India), however, found that "there is no significant difference in the operating performance of foreign invested versus non-invested firms over the short and medium run" (Petkova, 2009, p.1). This study therefore does not support the statement that MNCs outperformed other locally invested firms.

However, within the South African context, domestic firms may not have had the same access to global capital markets as do MNCs from Europe, Japan and the United States of America. Over the last five years, capital was disproportionately more expensive in the South African capital market with interest rates 6% higher in South Africa compared to the capital markets in developed countries. The greater access to cheaper capital may have allowed foreign owned firms to invest more which

allowed them to outperform local South African competitors in terms of market share growth. This, however, requires further analysis and is an opportunity for future research.

6.3.2 Headquarter Control vs. Inter-subsidiary Cooperation

Another link which was only touched on is the relationship between headquarter control and cooperation. As described in the literature review, Birkinshaw *et al*. (2000) found that higher levels of headquarter control lead to lower cooperation levels within MNCs. The correlation report (see Section 5.6.1.) found a statistically significant positive correlation between subsidiary autonomy and inter-subsidiary cooperation, or a statistically significant negative correlation between headquarter control and inter-subsidiary cooperation. This finding supports the statements from Birkinshaw *et al*. (2000) that greater headquarter control will reduce inter-subsidiary cooperation.

7 Conclusion

7.1 Main Findings

The research firstly set out to determine the impact of headquarter control and inter-subsidiary cooperation on rent-seeking behaviour within MNCs. The literature within this field of research contains some conflicting arguments on how these variables impact rent-seeking behaviour within a multinational firm. There is also no previous research study which focussed on subsidiaries operating in South Africa or in general on subsidiaries operating on the periphery of the global economy. The study therefore focused on MNCs with headquarters in Europe, Japan and the United States which operate within South Africa. The actual respondents accurately reflect the census of MNCs which meet the guidelines mentioned above with the majority of these firms working in the manufacturing industry.

The second objective of the research was to study the impact of rent-seeking behaviour, headquarter control, inter-subsidiary cooperation, inter-subsidiary competition and inter-subsidiary coopetition on MNC performance. Again only limited research was available within this knowledge field, with the most notable study by Luo (2005).

Luo (2005) established the framework for an inter-subsidiary business strategy with both cooperative and competitive elements (see Section 2.3.3.: Figure 4). Although previous researchers studied the impact of

headquarter control on business performance, this research study is the first to analyse the impact of inter-subsidiary coopetition on MNC performance for subsidiaries operating within South Africa or on the periphery of the global economy. The findings of the research are shown in Figure 24 and 25 and discussed below.

Figure 24: Findings for Rent-seeking Model (Hypothesis 1)

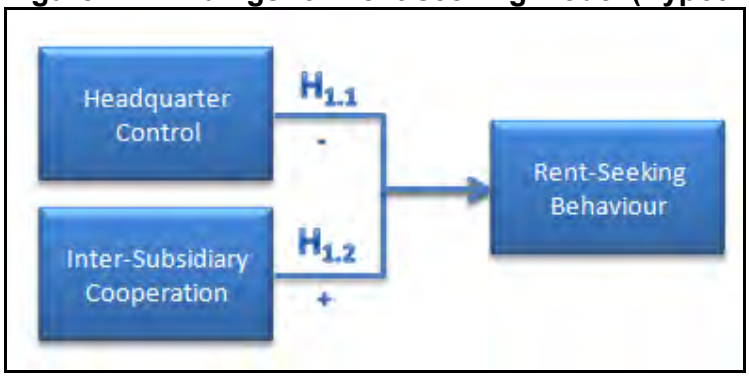
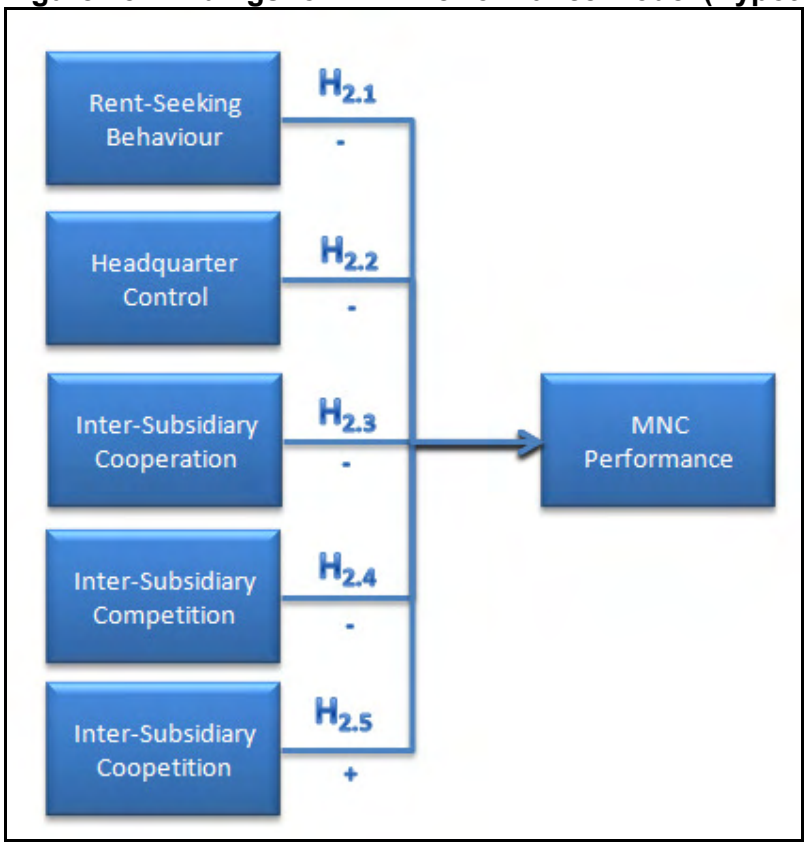


Figure 25: Findings for MNC Performance Model (Hypothesis 2)



The research found a statistically significant negative relationship between headquarter control and rent-seeking behaviour (see Figure 24). Although this does not prove causality, the finding seems to infer that higher levels of headquarter control will reduce rent-seeking behaviour within subsidiaries. The study also confirmed the impact of rent-seeking on MNC performance. Based on the analysis rent-seeking behaviour has a statistical significant negative correlation with MNC domestic subsidiary performance (see Figure 25), which therefore confirms previous researchers' findings that rent-seeking behaviour negatively impacts on MNC performance.

It is important to consider, however, that the research also found a statistically significant negative correlation between headquarter control and global MNC performance (see Figure 25). Although high levels of headquarter control will assist to reduce rent-seeking behaviour within MNC subsidiaries (see Figure 24), it will have a net negative impact on global MNC performance.

The study found that there is a statistically significant positive relationship between inter-subsidiary cooperation and rent-seeking behaviour (see Figure 24). This finding contradicts the findings of previous researchers on the topic. The difference in the findings may be due to region specific and/or other factors mentioned and discussed in Section 6.1.2.

For the determinants of MNC performance, the following are the findings with reference to the level of inter-subsidiary cooperation and/or competition within the MNC (see Figure 25):

- A high level of either inter-subsidiary cooperation or inter-subsidiary competition has a net negative impact on MNC performance.
- However, a combination of both high inter-subsidiary cooperation and inter-subsidiary competition (inter-subsidiary coopetition) has a net positive impact on MNC business performance.

These findings support the findings of similar research studies conducted in other countries (For example, Luo (2005)) and provide clarity on the ideal business strategy MNCs should pursue within the South African business environment.

7.2 Recommendations to Stakeholders

The research findings provide a clear strategic framework for MNCs which operate within South Africa and with subsidiaries which operate on the periphery of the global economy. MNC business strategy should always consider the main objective of its business model, which is to maximise shareholder value and profit. To achieve this goal the research findings therefore suggest that a MNC should:

- Allow its subsidiaries sufficient autonomy (limit headquarter control) to make strategic decisions that will maximise the opportunity within its specific local market. Although the research

findings suggest that this will probably increase rent-seeking behaviour, the net gains are positive on the global performance measure (see Section 6.2.2).

- Limit rent-seeking behaviour within the company. Rent-seeking behaviour has a negative impact on business performance and should therefore be constrained as far as possible (see Section 6.2.1).
- Implement a global inter-subsidiary business strategy which promotes high levels of both cooperation and competition between subsidiaries. Based on the research, an inter-subsidiary business strategy that promotes coopetition will maximise MNC performance. This is the key recommendation from the findings of the research study.

Luo (2005) provides a list of determinants for cooperation and competition between subsidiaries. Promoting these determinants will create a "Network Captain"-subsidiary (see Section 2.3.3: Figure 4), which should maximise business performance. The lists of determinants that promote cooperation and competition are listed in *Sections 2.3.1.* and *2.3.2*.

Kotabe *et al*. (2004) and Yu *et al.* (2009) agree that an effective global sourcing strategy creates a competitive advantage for an MNC. One recommendation to create an MNC that operates as a "Network Captain" (see Figure 23) is to promote competitive bidding between subsidiaries for global supply (production) contracts. This will create the inter-subsidiary

competition needed to drive continuous innovation and improvement within subsidiaries.

Each subsidiary will however also require support (cooperation) from both its MNC headquarters and other subsidiaries to develop it competence to effectively compete in this bidding process. Subsidiaries that develop new best-practise techniques and competence should therefore be rewarded for sharing knowledge with other subsidiaries to promote inter-subsidiary cooperation. The competitive bidding (inter-subsidiary competition) and development support (inter-subsidiary cooperation) will assist an MNC to develop a flexible competitive global supply network.

A flexible competitive global supply network will allow an MNC to effectively counter risks like exchange rate volatility and increased global competition. If the currency of a supply country strengthens, it can place enormous downward pressure on profit margins as manufacturing costs escalate within that country. An MNC with many competitive sources of supply (subsidiaries) can, however, easily move production from one country to another. The continuous development and roll-out of improvements and innovations driven by coopetition between subsidiaries will also ensure the MNC remains globally competitive.

7.3 Recommendations for Future Research

The following section provides recommendations for future research:

It is clear from the research that an increase in headquarter control will constrain rent-seeking behaviour; however, an increase in headquarter control will have a negative net impact on MNC performance. It may therefore be useful to further analyse this inter-relationship and to determine the exact elements of headquarter control which harm or contribute the MNC performance and which constrain or promote rent-seeking behaviour within a MNC. It may be that certain elements of headquarter control do not harm MNC performance but can assist in constraining rent-seeking behaviour within the firm. These specific elements can then be included in a business strategy to reduce rent-seeking without affecting the overall financial performance of the firm.

Another area that requires further analysis is the ideal level of headquarter control (or subsidiary autonomy) within the various life cycle stages of a MNC. It may be that start-up firms perform better with higher levels of subsidiary autonomy, whilst firms in the mature life cycle stage requires greater levels of headquarter control to deliver the best results.

Further research is required to understand the differences between the findings of this study and the findings of Mudambi *et al.* (2004) and Osterloh *et al.* (2000). Further analysis is needed to determine whether these differences are attributable to:

- Regional specific factors and/or

- Other factors not included in the analysis and/or
- Incorrect assumptions on the part of Mudambi *et al.* (2004) and/or Osterloh *et al.* (2000).

With reference to the regional specific factors, a comparative study should analyse the difference in rent-seeking behaviour and cooperation levels between subsidiaries which operate within the Triad and on the periphery of the global economy.

Future research may also focus on specific industry sectors. 78% of the sample included in this study was from the manufacturing sector. The results of this study are therefore most applicable to the manufacturing sector. A larger sample from other specific industries may provide a different set of results and recommendations more appropriate to those specific industries.

Another area which will shed more light on the drivers of MNC performance is to analyse the impact and interaction of the sub-elements of cooperation and competition on each other and on overall business performance. This research study determined that a combination inter-subsidiary cooperation and competition is needed to maximise business performance. A detailed understanding of the interaction of the sub-elements of these variables will further clarify exact strategies and actions which MNCs can implement to maximise their business performance.

8 Consistency Matrix

The consistency matrix shows the alignment between the research problem, literature, research methodology and the analysis approach. This matrix is included in Table 35.

Table 35: Consistency Matrix

Hypotheses	Literature Review	Data Collection Tool	Analysis
$H_{1.1}$: MNCs with higher levels of headquarter control will have either higher or lower levels of rent-seeking behaviour within the firm.	Frey *et al.* (1998) Osterloh *et al.* (2000) Mudambi *et al.* (2004) Foss *et al.* (2006) Andersson *et al.* (2007)	Questionnaire: Q4.6-4.7; Q6.1-6.4	Multiple linear regression where y=Rent-seeking; Correlations; MANOVA
$H_{1.2}$: MNCs with higher levels of cooperation between subsidiaries will have lower levels of rent-seeking behaviour within the firm.	Osterloh *et al.* (2000) Mudambi *et al.* (2004)	Questionnaire: Q4.1-4.5; Q6.1-6.4	
$H_{2.1}$: MNCs with high levels of rent-seeking behaviour perform worse than MNCs with low levels of rent-seeking behaviour.	Scharfstein *et al.* (2000) Mudambi *et al.* (2004) Foss *et al.* (2006) Andersson *et al.* (2007)	Questionnaire: Q3.1; Q6.1-6.4 & OSIRIS Database	Multiple linear regression where y=MNC Performance; Correlations; MANOVA
$H_{2.2}$: MNCs with high levels of headquarter control perform either better or worse than MNCs with lower levels of headquarter control.	Birkinshaw *et al.* (2000) Luo (2003) Ambos *et al.* (2006) Andersson *et al.* (2007) Festing *et al.* (2007) Fisher *et al.* (2007) Bouquet *et al.* (2008)	Questionnaire: Q3.1; Q4.6-4.7 & OSIRIS Database	
$H_{2.3}$: MNCs with high levels of inter-subsidiary cooperation perform better than MNCs with lower levels of inter-subsidiary cooperation.	Birkinshaw *et al.* (2000) Luo (2003) Fynes *et al.* (2005) Luo (2005) Wu *et al.* (2005) Luo *et al.* (2006)	Questionnaire: Q3.1; Q4.1-4.5 & OSIRIS Database	
$H_{2.4}$: MNCs with high levels of competition between subsidiaries perform worse than MNCs with lower levels of competition between their subsidiaries.	Luo (2003) Kotabe *et al*. (2004) Luo (2005)	Questionnaire: Q3.1; Q5.1-5.9 & OSIRIS Database	
$H_{2.5}$: MNCs with high levels of both cooperation and competition (coopetition) between subsidiaries perform better than MNCs with lower levels of coopetition between its subsidiaries.	Ghoshal *et al.* (1990) Luo (2005) Wu *et al.* (2005) Luo *et al.* (2006) Ross *et al.* (2007)	Questionnaire: Q3.1; Q4.1-4.5; Q5.1-5.9 & OSIRIS Database	

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Appendices

Appendix A: Questionnaire

GORDON INSTITUTE OF BUSINESS SCIENCE

Inter-Subsidiary Business Strategy within Multinational Corporations

1. Page 1 of 2

50%

Thank you for setting time aside to complete this questionnaire. It will require approximately 12 minutes of your time. The questionnaire deals with the impact of various inter-subsidiary business strategies on company performance. This is an academic study conducted through the Gordon Institute of Business Science at the University of Pretoria. The specific purpose of this questionnaire is to obtain information on the level of cooperation and/or competition between subsidiaries within various Multinational corporations. Your willingness to participate is appreciated. We require fairly specific information to control for different factors that may influence our interpretation of the results. However, please note that all participants remain completely anonymous throughout the research and, once the questionnaire has been completed, the information is regarded as confidential. The specific names of companies will similarly, also remain completely anonymous.

Your participation is voluntary and you can withdraw at any time without penalty. By completing the survey, you indicate that you voluntarily participate in this research. If you have any concerns, please contact me or my research supervisor. Our details are provided below:

Researcher
Francois Retief
fjpretief@gmail.com
082 782 5595

Research Supervisor
Dr. Helena Barnard
barnardh@gibs.co.za
(011)771 4213

1. I hereby give consent for the ANONYMOUS data collected in this survey below to be utilised for the purpose of a research project and a possible academic journal article publication (national and/or international)

Please tick if you agree

2. What percentage of your South African operations' top management (directors and above) are from South Africa?

3. Can you please rate your business based on the following criteria where "Strongly disagree" is a 1 and "Strongly agree" is a 7.

	1. Strongly disagree	2. Disagree	3. Slightly disagree	4. Neutral	5. Slightly agree	6. Agree	7. Strongly agree
3.1. Our South African subsidiary's domestic market share has increased over the last 5 years.							

4. Can you please rate your business based on the following criteria where "Strongly disagree" is a 1 and "Strongly agree" is a 7.

	1. Strongly disagree	2. Disagree	3. Slightly disagree	4. Neutral	5. Slightly agree	6. Agree	7. Strongly agree
4.1. Our subsidiary ... Identify new and useful market knowledge transferred from other subsidiaries.							
4.2. Our subsidiary ... Understands new and useful market knowledge transferred from other subsidiaries.							
4.3. Our subsidiary is good at assimilating new and useful market knowledge transferred from other subsidiaries.							
4.4. We regularly apply new and useful market knowledge transferred from other subsidiaries.							
4.5. Our subsidiary is good at exploiting new and useful market knowledge transferred from other subsidiaries.							
4.6. Our subsidiary can choose its suppliers without consulting the global divisional management.							
4.7. Our subsidiary can change its organization without consulting the global division management.							
4.8. Our global divisional management's and subsidiary's interests are usually identical when it concerns size and direction of subsidiary investments.							
4.9. Our global divisional management's and subsidiary's interests are usually identical when it concerns purchasing.							
4.10. Our subsidiary and the global divisional management fully agree about the subsidiary role in the relationship.							

Next

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GORDON INSTITUTE OF BUSINESS SCIENCE

Inter-Subsidiary Business Strategy within Multinational Corporations

2. Page 2 of 2

100%

5. Can you please rate your business based on the following criteria where "Strongly disagree" is a 1 and "Strongly agree" is a 7.

	1. Strongly disagree	2. Disagree	3. Slightly disagree	4. Neutral	5. Slightly agree	6. Agree	7. Strongly agree
5.1.We regularly compete for the limited resources across subsidiaries.							
5.2.When members of several subsidiaries talk about distribution of resources (i.e., capital, personnel)across subsidiaries,tensions frequently run high.							
5.3.Subsidiaries regularly compete with each other for more mental attention and time from global top executives.							
5.4.To get more resources for our subsidiary, other subsidiaries oftentimes have to make sacrifices.							
5.5.Individual subsidiaries here try to obtain more time and attention from global managers even at the costs of other subsidiaries.							
5.6.Each subsidiary is constantly compared and benchmarked with other subsidiaries to improve efficiency in the organization.							
5.7.Most subsidiaries here try to gain more strategic importance and power inside the firm.							
5.8.The objectives pursued by our South African subsidiary are incompatible with those of other global subsidiaries.							
5.9.Protecting our South African subsidiary is considered to be a way of life in this business.							
5.10.People from different subsidiaries feel that the goals of their respective subsidiaries are in harmony with each other.							

6. Can you please rate your business based on the following criteria where "Strongly disagree" is a 1 and "Strongly agree" is a 7.

	1. Strongly disagree	2. Disagree	3. Slightly disagree	4. Neutral	5. Slightly agree	6. Agree	7. Strongly agree
6.1.Decisions on global suppliers are made in South Africa.							
6.2.Our South African branch is responsible for senior management hiring at our subsidiary.							
6.3.Our South African subsidiary impacts the direction of the firms' global business strategy.							
6.4.Our South African subsidiary impacts the direction of the firms' global marketing strategy.							

7. Gender

- Male
- Female

8. Year of birth (e.g. 1962)

9. Company Name

10. What is your current job level?

- Employee
- Middle Management
- Senior- or Top Management

Prev Done

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Appendix B: Frequency Tables for Questionnaire Results

Frequency Table Report
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Database

Frequency Distribution of Q3_1

Q3_1	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	4	4	6.35	6.35	||
2	4	8	6.35	12.70	||
3	4	12	6.35	19.05	||
4	6	18	9.52	28.57	|||
5	16	34	25.40	53.97	|||||||||
6	21	55	33.33	87.30	|||||||||||
7	8	63	12.70	100.00	|||||

Frequency Distribution of Q3_2

Q3_2	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	1	1	1.59	1.59	|
2	5	6	7.94	9.52	|||
3	3	9	4.76	14.29	|
4	4	13	6.35	20.63	||
5	8	21	12.70	33.33	|||||
6	19	40	30.16	63.49	|||||||||||
7	23	63	36.51	100.00	||||||||||||

Frequency Distribution of Q4_1

Q4_1	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
2	1	1	1.61	1.61	|
3	4	5	6.45	8.06	||
4	5	10	8.06	16.13	|||
5	23	33	37.10	53.23	||||||||||||
6	21	54	33.87	87.10	|||||||||||
7	8	62	12.90	100.00	|||||

Frequency Distribution of Q4_2

Q4_2	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
2	2	2	3.17	3.17	|
3	4	6	6.35	9.52	||
4	3	9	4.76	14.29	|
5	20	29	31.75	46.03	|||||||||||
6	26	55	41.27	87.30	|||||||||||||
7	8	63	12.70	100.00	|||||

Frequency Table Report

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Database

Frequency Distribution of Q4_3

Q4_3	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
2	2	2	3.17	3.17	|
3	6	8	9.52	12.70	|||
4	5	13	7.94	20.63	|||
5	23	36	36.51	57.14	||||||||||||
6	20	56	31.75	88.89	||||||||||
7	7	63	11.11	100.00	||||

Frequency Distribution of Q4_4

Q4_4	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
3	9	9	14.29	14.29	|||||
4	2	11	3.17	17.46	|
5	25	36	39.68	57.14	|||||||||||||
6	18	54	28.57	85.71	||||||||||
7	9	63	14.29	100.00	|||||

Frequency Distribution of Q4_5

Q4_5	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
2	4	4	6.45	6.45	||
3	7	11	11.29	17.74	||||
4	7	18	11.29	29.03	||||
5	31	49	50.00	79.03	|||||||||||||||||||
6	9	58	14.52	93.55	|||||
7	4	62	6.45	100.00	||

Frequency Distribution of Q4_6

Q4_6	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	6	6	9.52	9.52	|||
2	8	14	12.70	22.22	|||||
3	6	20	9.52	31.75	|||
4	6	26	9.52	41.27	|||
5	10	36	15.87	57.14	||||||
6	22	58	34.92	92.06	|||||||||||
7	5	63	7.94	100.00	|||

Frequency Table Report

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Database

Frequency Distribution of Q4_7

Q4_7	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	12	12	19.05	19.05	|||||||
2	8	20	12.70	31.75	|||||
3	15	35	23.81	55.56	||||||||
4	4	39	6.35	61.90	||
5	15	54	23.81	85.71	||||||||
6	7	61	11.11	96.83	||||
7	2	63	3.17	100.00	|

Frequency Distribution of Q4_8

Q4_8	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	4	4	6.35	6.35	||
2	4	8	6.35	12.70	||
3	9	17	14.29	26.98	|||||
4	12	29	19.05	46.03	|||||||
5	14	43	22.22	68.25	|||||||
6	18	61	28.57	96.83	|||||||||
7	2	63	3.17	100.00	|

Frequency Distribution of Q4_9

Q4_9	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	1	1	1.59	1.59	|
2	10	11	15.87	17.46	||||||
3	9	20	14.29	31.75	|||||
4	13	33	20.63	52.38	|||||||
5	19	52	30.16	82.54	||||||||||
6	5	57	7.94	90.48	|||
7	6	63	9.52	100.00	|||

Frequency Distribution of Q4_10

Q4_10	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	1	1	1.59	1.59	|
2	1	2	1.59	3.17	|
3	6	8	9.52	12.70	|||
4	12	20	19.05	31.75	||||||
5	11	31	17.46	49.21	||||||
6	27	58	42.86	92.06	||||||||||||||
7	5	63	7.94	100.00	|||

Frequency Table Report

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Database

Frequency Distribution of Q5_1

Q5_1	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	3	3	4.76	4.76	|
2	4	7	6.35	11.11	||
3	5	12	7.94	19.05	|||
4	12	24	19.05	38.10	|||||||
5	17	41	26.98	65.08	|||||||||
6	17	58	26.98	92.06	|||||||||
7	5	63	7.94	100.00	|||

Frequency Distribution of Q5_2

Q5_2	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	3	3	4.76	4.76	|
2	10	13	15.87	20.63	||||||
3	10	23	15.87	36.51	||||||
4	15	38	23.81	60.32	||||||||
5	14	52	22.22	82.54	|||||||
6	6	58	9.52	92.06	|||
7	5	63	7.94	100.00	|||

Frequency Distribution of Q5_3

Q5_3	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	2	2	3.17	3.17	|
2	7	9	11.11	14.29	||||
3	8	17	12.70	26.98	|||||
4	16	33	25.40	52.38	|||||||||
5	14	47	22.22	74.60	|||||||
6	10	57	15.87	90.48	||||||
7	6	63	9.52	100.00	|||

Frequency Distribution of Q5_4

Q5_4	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	4	4	6.35	6.35	||
2	7	11	11.11	17.46	||||
3	11	22	17.46	34.92	||||||
4	13	35	20.63	55.56	||||||||
5	13	48	20.63	76.19	||||||||
6	8	56	12.70	88.89	|||||
7	7	63	11.11	100.00	||||

Frequency Table Report

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Database

Frequency Distribution of Q5_5

Q5_5	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	3	3	4.84	4.84	|
2	17	20	27.42	32.26	|||||||||
3	6	26	9.68	41.94	|||
4	14	40	22.58	64.52	||||||||
5	11	51	17.74	82.26	||||||
6	9	60	14.52	96.77	|||||
7	2	62	3.23	100.00	|

Frequency Distribution of Q5_6

Q5_6	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	1	1	1.64	1.64	|
2	3	4	4.92	6.56	|
3	5	9	8.20	14.75	|||
4	9	18	14.75	29.51	|||||
5	12	30	19.67	49.18	||||||
6	16	46	26.23	75.41	|||||||||
7	15	61	24.59	100.00	||||||||

Frequency Distribution of Q5_7

Q5_7	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	2	2	3.23	3.23	|
2	7	9	11.29	14.52	||||
3	8	17	12.90	27.42	|||||
4	15	32	24.19	51.61	||||||||
5	14	46	22.58	74.19	||||||||
6	11	57	17.74	91.94	||||||
7	5	62	8.06	100.00	|||

Frequency Distribution of Q5_8

Q5_8	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	10	10	15.87	15.87	|||||
2	19	29	30.16	46.03	||||||||||
3	10	39	15.87	61.90	|||||
4	12	51	19.05	80.95	||||||
5	6	57	9.52	90.48	|||
6	6	63	9.52	100.00	|||

Frequency Table Report

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Database

Frequency Distribution of Q5_9

Q5_9	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	4	4	6.35	6.35	||
2	9	13	14.29	20.63	|||||
3	6	19	9.52	30.16	|||
4	16	35	25.40	55.56	|||||||||
5	10	45	15.87	71.43	||||||
6	14	59	22.22	93.65	|||||||
7	4	63	6.35	100.00	||

Frequency Distribution of Q5_10

Q5_10	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
2	21	21	33.33	33.33	|||||||||||
3	13	34	20.63	53.97	|||||||
4	15	49	23.81	77.78	||||||||
5	5	54	7.94	85.71	|||
6	8	62	12.70	98.41	|||||
7	1	63	1.59	100.00	|

Frequency Distribution of Q6_1

Q6_1	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	14	14	22.22	22.22	|||||||
2	21	35	33.33	55.56	|||||||||||
3	9	44	14.29	69.84	|||||
4	8	52	12.70	82.54	|||||
5	8	60	12.70	95.24	|||||
6	2	62	3.17	98.41	|
7	1	63	1.59	100.00	|

Frequency Distribution of Q6_2

Q6_2	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	3	3	4.84	4.84	|
2	7	10	11.29	16.13	||||
3	11	21	17.74	33.87	|||||||
4	5	26	8.06	41.94	|||
5	14	40	22.58	64.52	||||||||
6	15	55	24.19	88.71	||||||||
7	7	62	11.29	100.00	||||

Frequency Table Report

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Database

Frequency Distribution of Q6_3

Q6_3	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	4	4	6.45	6.45	||
2	18	22	29.03	35.48	||||||||||
3	10	32	16.13	51.61	||||||
4	12	44	19.35	70.97	|||||||
5	7	51	11.29	82.26	||||
6	8	59	12.90	95.16	|||||
7	3	62	4.84	100.00	|

Frequency Distribution of Q6_4

Q6_4	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	8	8	12.70	12.70	|||||
2	17	25	26.98	39.68	|||||||||
3	14	39	22.22	61.90	|||||||
4	9	48	14.29	76.19	|||||
5	10	58	15.87	92.06	||||||
6	3	61	4.76	96.83	|
7	2	63	3.17	100.00	|

Frequency Distribution of Q6_5

Q6_5	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	7	7	11.29	11.29	||||
2	6	13	9.68	20.97	|||
3	7	20	11.29	32.26	||||
4	9	29	14.52	46.77	|||||
5	11	40	17.74	64.52	|||||||
6	16	56	25.81	90.32	|||||||||
7	6	62	9.68	100.00	|||

Frequency Distribution of Q6_6

Q6_6	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
1	4	4	6.45	6.45	||
2	9	13	14.52	20.97	|||||
3	13	26	20.97	41.94	|||||||
4	10	36	16.13	58.06	||||||
5	15	51	24.19	82.26	||||||||
6	9	60	14.52	96.77	|||||
7	2	62	3.23	100.00	|

Frequency Table Report

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Database

Frequency Distribution of Q6_7

Q6_7	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
3	2	2	3.17	3.17	|
4	5	7	7.94	11.11	|||
5	9	16	14.29	25.40	|||||
6	31	47	49.21	74.60	|||||||||||||||||||
7	16	63	25.40	100.00	|||||||||

Frequency Distribution of Q6_8

Q6_8	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
3	4	4	6.35	6.35	||
4	6	10	9.52	15.87	|||
5	7	17	11.11	26.98	||||
6	30	47	47.62	74.60	||||||||||||||||||
7	16	63	25.40	100.00	|||||||||

Appendix C: Correlation Report (Cronbach's Alpha)

Correlation Report
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Database

Pearson Correlations Section (Row-Wise Deletion)

	Q4_6	Q4_7
Q4_6	1.000000	0.531003
Q4_7	0.531003	1.000000

Cronbachs Alpha = 0.693054 Standardized Cronbachs Alpha = 0.693667

Pearson Correlations Section (Row-Wise Deletion)

	Q4_8	Q4_9	Q4_10
Q4_8	1.000000	0.535719	0.439527
Q4_9	0.535719	1.000000	0.298543
Q4_10	0.439527	0.298543	1.000000

Cronbachs Alpha = 0.691437 Standardized Cronbachs Alpha = 0.688835

Pearson Correlations Section (Row-Wise Deletion)

	Q4_1	Q4_2	Q4_3	Q4_4	Q4_5
Q4_1	1.000000	0.601434	0.648576	0.682512	0.554446
Q4_2	0.601434	1.000000	0.750417	0.641221	0.605708
Q4_3	0.648576	0.750417	1.000000	0.800563	0.772615
Q4_4	0.682512	0.641221	0.800563	1.000000	0.683799
Q4_5	0.554446	0.605708	0.772615	0.683799	1.000000

Cronbachs Alpha = 0.912174 Standardized Cronbachs Alpha = 0.911844

Pearson Correlations Section (Row-Wise Deletion)

	Q5_1	Q5_2	Q5_3	Q5_4	Q5_5	Q5_6
Q5_1	1.000000	0.483408	0.524052	0.402490	0.395845	0.416550
Q5_2	0.483408	1.000000	0.682974	0.617711	0.600212	0.208010
Q5_3	0.524052	0.682974	1.000000	0.460881	0.445552	0.236541
Q5_4	0.402490	0.617711	0.460881	1.000000	0.601115	0.361279
Q5_5	0.395845	0.600212	0.445552	0.601115	1.000000	0.100198
Q5_6	0.416550	0.208010	0.236541	0.361279	0.100198	1.000000
Q5_7	0.541755	0.585409	0.581604	0.514690	0.563196	0.450871
Q5_8	0.043144	0.265784	0.205235	0.088900	0.370952	-0.091932
Q5_9	0.466202	0.526259	0.488152	0.501934	0.466093	0.337477
Q5_10	0.089908	0.186216	0.186200	0.184143	0.331464	-0.090063

Cronbachs Alpha = 0.850090 Standardized Cronbachs Alpha = 0.846525

Pearson Correlations Section (Row-Wise Deletion)

	Q5_7	Q5_8	Q5_9	Q5_10
Q5_1	0.541755	0.043144	0.466202	0.089908
Q5_2	0.585409	0.265784	0.526259	0.186216
Q5_3	0.581604	0.205235	0.488152	0.186200
Q5_4	0.514690	0.088900	0.501934	0.184143

Q5_5	0.563196	0.370952	0.466093	0.331464
Q5_6	0.450871	-0.091932	0.337477	-0.090063
Q5_7	1.000000	0.326993	0.748555	0.058973
Q5_8	0.326993	1.000000	0.226689	0.176407
Q5_9	0.748555	0.226689	1.000000	0.129117
Q5_10	0.058973	0.176407	0.129117	1.000000

Cronbachs Alpha = 0.850090 Standardized Cronbachs Alpha = 0.846525

Pearson Correlations Section (Row-Wise Deletion)

	Q4_1	Q4_2	Q4_3	Q4_4	Q4_5	Q5_1
Q4_1	1.000000	0.589325	0.631881	0.669749	0.534726	0.282281
Q4_2	0.589325	1.000000	0.742518	0.616643	0.592559	0.106643
Q4_3	0.631881	0.742518	1.000000	0.792779	0.763389	0.187381
Q4_4	0.669749	0.616643	0.792779	1.000000	0.677450	0.316999
Q4_5	0.534726	0.592559	0.763389	0.677450	1.000000	0.112564
Q5_1	0.282281	0.106643	0.187381	0.316999	0.112564	1.000000
Q5_2	-0.055067	0.026028	0.040060	0.017062	-0.077781	0.415968
Q5_3	0.041793	-0.158063	-0.082180	0.045418	-0.168988	0.448756
Q5_4	0.018031	-0.186332	-0.196272	-0.186251	-0.192817	0.344080
Q5_5	-0.060867	-0.089605	-0.056480	0.003756	-0.026721	0.328548
Q5_6	0.396747	0.161046	0.260846	0.279424	0.061511	0.369097
Q5_7	0.179462	-0.022331	0.159118	0.256928	0.078305	0.483873
Q5_8	-0.108918	-0.016133	0.030107	0.122861	0.130092	-0.017908
Q5_9	0.092416	-0.020500	0.136983	0.129364	0.251113	0.392053
Q5_10	-0.109762	-0.090717	-0.176975	-0.156544	-0.170269	0.060203

Cronbachs Alpha = 0.800306 Standardized Cronbachs Alpha = 0.799848

Pearson Correlations Section (Row-Wise Deletion)

	Q5_2	Q5_3	Q5_4	Q5_5	Q5_6	Q5_7
Q4_1	-0.055067	0.041793	0.018031	-0.060867	0.396747	0.179462
Q4_2	0.026028	-0.158063	-0.186332	-0.089605	0.161046	-0.022331
Q4_3	0.040060	-0.082180	-0.196272	-0.056480	0.260846	0.159118
Q4_4	0.017062	0.045418	-0.186251	0.003756	0.279424	0.256928
Q4_5	-0.077781	-0.168988	-0.192817	-0.026721	0.061511	0.078305
Q5_1	0.415968	0.448756	0.344080	0.328548	0.369097	0.483873
Q5_2	1.000000	0.645918	0.588532	0.565163	0.142936	0.543932
Q5_3	0.645918	1.000000	0.412986	0.389522	0.165851	0.533386
Q5_4	0.588532	0.412986	1.000000	0.573389	0.310718	0.473316
Q5_5	0.565163	0.389522	0.573389	1.000000	0.029980	0.525240
Q5_6	0.142936	0.165851	0.310718	0.029980	1.000000	0.399998
Q5_7	0.543932	0.533386	0.473316	0.525240	0.399998	1.000000
Q5_8	0.233093	0.164156	0.046812	0.346814	-0.171504	0.292853
Q5_9	0.475633	0.423980	0.461567	0.417023	0.287669	0.723320
Q5_10	0.167186	0.166231	0.160932	0.320566	-0.156103	0.024693

Cronbachs Alpha = 0.800306 Standardized Cronbachs Alpha = 0.799848

Pearson Correlations Section (Row-Wise Deletion)

	Q6_1	Q6_2	Q6_3	Q6_4
Q6_1	1.000000	0.103234	0.447509	0.687387
Q6_2	0.103234	1.000000	0.315283	0.287407
Q6_3	0.447509	0.315283	1.000000	0.699834
Q6_4	0.687387	0.287407	0.699834	1.000000

Cronbachs Alpha = 0.738924 Standardized Cronbachs Alpha = 0.746046

Appendix D: Regression Report (Hypothesis 1)

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent
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Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Rent	Rows Processed	63
Number Ind. Variables	11	Rows Filtered Out	0
Weight Variable	None	Rows with X's Missing	0
R2	0.4304	Rows with Weight Missing	0
Adj R2	0.3076	Rows with Y Missing	0
Coefficient of Variation	0.2757	Rows Used in Estimation	63
Mean Square Error	0.9127904	Sum of Weights	59.241
Square Root of MSE	0.9554006	Completion Status	Normal
Completion			
Ave Abs Pct Error	27.862		

Descriptive Statistics Section

Variable	Count	Mean	Standard Deviation	Minimum	Maximum
Cooperation	63	5.116643	0.9844938	2.6	7
(HQ="JPN")	63	0.0844008	0.2717327	0	1
(HQ="NA")	63	0.3465925	0.4651762	0	1
(Industry="HRIM")	63	5.986104E-02	0.2318911	0	1
(Industry="KIS")	63	6.740392E-02	0.2450785	0	1
(Industry="MHRIM")	63	0.54807	0.486485	0	1
(Industry="MLRIM")	63	0.2258343	0.4087218	0	1
Size_employ	63	97056.59	91386.7	21	427000
Size_turnover	63	45166.18	58333.34	0.7919124	362064
SubAutonomy	63	3.947364	1.56928	1	7
Yrs_in_country	63	43.24042	31.91911	3	149
Rent	63	3.46541	1.148176	1	7

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent
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Regression Equation Section

Independent Variable	Regression Coefficient b(i)	Standard Error Sb(i)	T-Value to test H0:B(i)=0	Prob Level	Reject H0 at 5%?	Power of Test at 5%
Intercept	0.8861	0.8364	1.059	0.2944	No	0.1800
Cooperation	0.2507	0.1515	1.655	0.1041	No	0.3685
(HQ="JPN")	0.2648	0.4871	0.544	0.5890	No	0.0832
(HQ="NA")	0.2562	0.2947	0.869	0.3888	No	0.1366
(Industry="HRIM")	0.4696	0.7057	0.665	0.5088	No	0.1001
(Industry="KIS")	0.3010	0.6411	0.470	0.6407	No	0.0747
(Industry="MHRIM")	-0.3121	0.4525	-0.690	0.4936	No	0.1039
(Industry="MLRIM")	-0.1461	0.5104	-0.286	0.7759	No	0.0591
Size_employ	0.0000	0.0000	0.000	1.0000	No	0.0500
Size_turnover	0.0000	0.0000	0.000	1.0000	No	0.0500
SubAutonomy	0.3282	0.1032	3.179	0.0025	Yes	0.8767
Yrs_in_country	0.0012	0.0045	0.263	0.7933	No	0.0577

Estimated Model

.88605226519822+ .250650093356908*Cooperation+ .264831122362502*(HQ="JPN")+ .256160972880312*(HQ="NA")+ .469611609792629*(Industry="HRIM")+ .300981979587393*(Industry="KIS")-.312055730471609*(Industry="MHRIM")-.14608320575958*(Industry="MLRIM")+ 2.70864685036019E-07*Size_employ-6.8992606759568E-07*Size_turnover+ .328181973807443*SubAutonomy+ 1.17423418643494E-03*Yrs_in_country

Regression Coefficient Section

Independent Variable	Regression Coefficient	Standard Error	Lower 95% C.L.	Upper 95% C.L.	Standardized Coefficient
Intercept	0.8861	0.8364	-0.7930	2.5651	0.0000
Cooperation	0.2507	0.1515	-0.0534	0.5547	0.2149
(HQ="JPN")	0.2648	0.4871	-0.7131	1.2427	0.0627
(HQ="NA")	0.2562	0.2947	-0.3355	0.8478	0.1038
(Industry="HRIM")	0.4696	0.7057	-0.9472	1.8865	0.0948
(Industry="KIS")	0.3010	0.6411	-0.9860	1.5880	0.0642
(Industry="MHRIM")	-0.3121	0.4525	-1.2205	0.5964	-0.1322
(Industry="MLRIM")	-0.1461	0.5104	-1.1707	0.8785	-0.0520
Size_employ	0.0000	0.0000			0.0216
Size_turnover	0.0000	0.0000			-0.0351
SubAutonomy	0.3282	0.1032	0.1209	0.5354	0.4485
Yrs_in_country	0.0012	0.0045	-0.0078	0.0101	0.0326

Note: The T-Value used to calculate these confidence limits was 2.008.

Robust Multiple Regression Using Huber's Method (C=1.345)

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Robust Regression Coefficients Section

Robust Iteration	Max % Change in any Beta	Robust B(0)	Robust B(1)	Robust B(2)	Robust B(3)
0	100.000	0.8785	0.2651	0.2409	0.2870
1	171.427	0.8823	0.2515	0.2626	0.2645
2	13.427	0.8829	0.2507	0.2653	0.2585
3	4.072	0.8848	0.2507	0.2650	0.2566
4	0.907	0.8857	0.2507	0.2649	0.2562
5	0.218	0.8859	0.2507	0.2648	0.2562
6	0.058	0.8860	0.2507	0.2648	0.2562
7	0.017	0.8860	0.2507	0.2648	0.2562
8	0.006	0.8860	0.2507	0.2648	0.2562
9	0.002	0.8861	0.2507	0.2648	0.2562
10	0.001	0.8861	0.2507	0.2648	0.2562

Robust Percentiles of Residuals Section

Iter. No.	Max % Change in any Beta	Percentiles of Absolute Residuals 25th	50th	75th	100th
0	100.000	0.309	0.619	1.201	2.616
1	171.427	0.327	0.614	1.128	2.652
2	13.427	0.334	0.619	1.100	2.657
3	4.072	0.335	0.621	1.091	2.658
4	0.907	0.336	0.621	1.089	2.658
5	0.218	0.336	0.621	1.089	2.658
6	0.058	0.336	0.621	1.088	2.658
7	0.017	0.336	0.621	1.088	2.658
8	0.006	0.336	0.621	1.088	2.658
9	0.002	0.336	0.621	1.088	2.658
10	0.001	0.336	0.621	1.088	2.658

Analysis of Variance Section

Source	DF	R2	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1		711.431	711.431			
Model	11	0.4304	35.18284	3.19844	3.504	0.0011	0.9870
Error	51	0.5696	46.55231	0.9127904			
Total(Adjusted)	62	1.0000	81.73515	1.318309			

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Analysis of Variance Detail Section

Model Term	DF	R2	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1		711.431	711.431			
Model	11	0.4304	35.18284	3.19844	3.504	0.0011	0.9870
Cooperation	1	0.0306	2.499341	2.499341	2.738	0.1041	0.3685
HQ	2	0.0098	0.8035476	0.4017738	0.440	0.6464	0.1178
Industry	4	0.0351	2.871553	0.7178884	0.786	0.5393	0.2346
Size_employ	1	0.0002	2.040065E-02	2.040065E-02	0.022	0.8818	0.0525
Size_turnover	1	0.0007	6.098825E-02	6.098825E-02	0.067	0.7971	0.0574
SubAutonomy	1	0.1129	9.224862	9.224862	10.106	0.0025	0.8767
Yrs_in_country	1	0.0008	6.331422E-02	6.331422E-02	0.069	0.7933	0.0577
Error	51	0.5696	46.55231	0.9127904			
Total(Adjusted)	62	1.0000	81.73515	1.318309			

PRESS Section

Parameter	From PRESS Residuals	From Regular Residuals
Sum of Squared Residuals	91.2067	46.55231
Sum of |Residuals|	60.98405	49.05704
R2	0.0000	0.4304

Normality Tests Section

Test Name	Test Value	Prob Level	Reject H0 At Alpha = 20%?
Shapiro Wilk	0.9897	0.876914	No
Anderson Darling	0.2207	0.833407	No
D'Agostino Skewness	0.1094	0.912874	No
D'Agostino Kurtosis	0.6856	0.492948	No
D'Agostino Omnibus	0.4821	0.785820	No

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Robust Residuals and Weights

Row	Actual Rent	Predicted Rent	Residual	Absolute Percent Error	Robust Weight
1	3.000	3.951	-0.951	31.711	1.0000
2	4.000	3.257	0.743	18.580	1.0000
3	2.250	4.224	-1.974	87.716	0.6200
4	2.750	3.227	-0.477	17.329	1.0000
5	5.500	3.887	1.613	29.328	0.7586
6	3.000	2.128	0.872	29.073	1.0000
7	2.000	2.470	-0.470	23.497	1.0000
8	3.750	4.113	-0.363	9.687	1.0000
9	3.500	2.908	0.592	16.906	1.0000
10	3.750	3.296	0.454	12.114	1.0000
11	6.500	5.268	1.232	18.958	0.9931
12	4.250	2.333	1.917	45.102	0.6384
13	4.000	3.266	0.734	18.356	1.0000
14	3.500	4.121	-0.621	17.751	1.0000
15	3.000	3.512	-0.512	17.066	1.0000
16	3.500	2.741	0.759	21.683	1.0000
17	2.750	2.925	-0.175	6.378	1.0000
18	2.000	3.347	-1.347	67.373	0.9082
19	2.000	1.809	0.191	9.568	1.0000
20	3.000	2.992	0.008	0.253	1.0000
21	4.000	3.751	0.249	6.233	1.0000
22	5.250	4.276	0.974	18.559	1.0000
23	4.750	3.877	0.873	18.387	1.0000
24	1.000	2.358	-1.358	135.758	0.9014
25	3.000	2.256	0.744	24.802	1.0000
26	4.000	4.525	-0.525	13.131	1.0000
27	5.500	3.563	1.937	35.224	0.6317
28	2.000	4.270	-2.270	113.506	0.5391
29	1.750	3.990	-2.240	128.016	0.5462
30	5.250	4.830	0.420	8.007	1.0000
31	2.000	2.921	-0.921	46.062	1.0000
32	5.000	3.237	1.763	35.263	0.6940
33	3.000	3.584	-0.584	19.460	1.0000
34	4.250	3.618	0.632	14.875	1.0000
35	3.500	3.326	0.174	4.958	1.0000
36	5.500	4.412	1.088	19.790	1.0000
37	2.250	3.682	-1.432	63.623	0.8548
38	3.250	3.123	0.127	3.912	1.0000
39	3.500	3.873	-0.373	10.654	1.0000
40	2.500	1.918	0.582	23.266	1.0000
41	3.000	3.354	-0.354	11.799	1.0000
42	4.750	4.089	0.661	13.923	1.0000
43	4.000	4.457	-0.457	11.416	1.0000
44	7.000	4.342	2.658	37.969	0.4604
45	2.750	2.703	0.047	1.698	1.0000
46	2.000	2.708	-0.708	35.409	1.0000
47	2.250	2.879	-0.629	27.937	1.0000

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Robust Residuals and Weights

Row	Actual Rent	Predicted Rent	Residual	Absolute Percent Error	Robust Weight
48	3.250	4.170	-0.920	28.313	1.0000
49	1.750	3.510	-1.760	100.597	0.6951
50	4.500	3.401	1.099	24.415	1.0000
51	1.000	2.179	-1.179	117.874	1.0000
52	3.500	3.679	-0.179	5.112	1.0000
53	2.250	2.547	-0.297	13.203	1.0000
54	4.750	4.992	-0.242	5.092	1.0000
55	3.000	2.664	0.336	11.192	1.0000
56	3.750	3.406	0.344	9.165	1.0000
57	4.000	3.738	0.262	6.545	1.0000
58	3.250	3.270	-0.020	0.619	1.0000
59	4.000	4.004	-0.004	0.099	1.0000
60	2.750	3.599	-0.849	30.882	1.0000
61	4.750	4.556	0.194	4.092	1.0000
62	3.250	3.606	-0.356	10.940	1.0000
63	4.500	4.271	0.229	5.097	1.0000

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Predicted Values with Confidence Limits of Means

Row	Actual Rent	Predicted Rent	Standard Error of Predicted	95% Lower Conf. Limit of Mean	95% Upper Conf. Limit of Mean
1	3.000	3.951	0.345	3.259	4.643
2	4.000	3.257	0.449	2.355	4.159
3	2.250	4.224	0.301	3.620	4.827
4	2.750	3.227	0.332	2.560	3.893
5	5.500	3.887	0.291	3.303	4.471
6	3.000	2.128	0.386	1.352	2.904
7	2.000	2.470	0.402	1.662	3.278
8	3.750	4.113	0.414	3.282	4.945
9	3.500	2.908	0.545	1.815	4.002
10	3.750	3.296	0.240	2.813	3.778
11	6.500	5.268	0.542	4.179	6.357
12	4.250	2.333	0.271	1.790	2.876
13	4.000	3.266	0.344	2.576	3.956
14	3.500	4.121	0.307	3.505	4.737
15	3.000	3.512	0.311	2.888	4.136
16	3.500	2.741	0.278	2.183	3.299
17	2.750	2.925	0.283	2.358	3.493
18	2.000	3.347	0.303	2.740	3.955
19	2.000	1.809	0.854	0.095	3.523
20	3.000	2.992	0.264	2.462	3.523
21	4.000	3.751	0.428	2.892	4.610
22	5.250	4.276	0.580	3.110	5.441
23	4.750	3.877	0.311	3.253	4.500
24	1.000	2.358	0.345	1.665	3.050
25	3.000	2.256	0.393	1.467	3.045
26	4.000	4.525	0.530	3.461	5.589
27	5.500	3.563	0.218	3.125	4.000
28	2.000	4.270	0.237	3.793	4.747
29	1.750	3.990	0.378	3.232	4.749
30	5.250	4.830	0.621	3.584	6.076
31	2.000	2.921	0.366	2.187	3.655
32	5.000	3.237	0.207	2.821	3.653
33	3.000	3.584	0.404	2.773	4.394
34	4.250	3.618	0.320	2.976	4.260
35	3.500	3.326	0.326	2.672	3.981
36	5.500	4.412	0.607	3.193	5.630
37	2.250	3.682	0.395	2.888	4.475
38	3.250	3.123	0.480	2.158	4.087
39	3.500	3.873	0.453	2.963	4.783
40	2.500	1.918	0.463	0.989	2.847
41	3.000	3.354	0.403	2.546	4.162
42	4.750	4.089	0.360	3.367	4.810
43	4.000	4.457	0.518	3.417	5.497
44	7.000	4.342	0.211	3.918	4.766
45	2.750	2.703	0.370	1.961	3.446
46	2.000	2.708	0.485	1.735	3.681
47	2.250	2.879	0.459	1.957	3.800

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Predicted Values with Confidence Limits of Means

Row	Actual Rent	Predicted Rent	Standard Error of Predicted	95% Lower Conf. Limit of Mean	95% Upper Conf. Limit of Mean
48	3.250	4.170	0.436	3.295	5.045
49	1.750	3.510	0.219	3.071	3.950
50	4.500	3.401	0.707	1.982	4.821
51	1.000	2.179	0.582	1.010	3.347
52	3.500	3.679	0.448	2.780	4.577
53	2.250	2.547	0.428	1.687	3.407
54	4.750	4.992	0.507	3.975	6.009
55	3.000	2.664	0.275	2.112	3.216
56	3.750	3.406	0.226	2.953	3.860
57	4.000	3.738	0.367	3.002	4.474
58	3.250	3.270	0.246	2.777	3.763
59	4.000	4.004	0.327	3.348	4.660
60	2.750	3.599	0.564	2.468	4.731
61	4.750	4.556	0.465	3.623	5.489
62	3.250	3.606	0.491	2.619	4.592
63	4.500	4.271	0.392	3.484	5.057

Robust Multiple Regression Using Huber's Method (C=1.345)

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Database D:\FRANCOIS BACKUP\MY DOCUME ... SS\DATA ANALYSIS_27092009.S0
Dependent Rent
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Residual Report

Row	Actual Rent	Predicted Rent	Residual	Absolute Percent Error	Sqrt(MSE) Without This Row
1	3.000	3.951	-0.951	31.711	0.954
2	4.000	3.257	0.743	18.580	0.958
3	2.250	4.224	-1.974	87.716	0.937
4	2.750	3.227	-0.477	17.329	0.962
5	5.500	3.887	1.613	29.328	0.942
6	3.000	2.128	0.872	29.073	0.955
7	2.000	2.470	-0.470	23.497	0.962
8	3.750	4.113	-0.363	9.687	0.963
9	3.500	2.908	0.592	16.906	0.960
10	3.750	3.296	0.454	12.114	0.963
11	6.500	5.268	1.232	18.958	0.942
12	4.250	2.333	1.917	45.102	0.938
13	4.000	3.266	0.734	18.356	0.958
14	3.500	4.121	-0.621	17.751	0.960
15	3.000	3.512	-0.512	17.066	0.962
16	3.500	2.741	0.759	21.683	0.958
17	2.750	2.925	-0.175	6.378	0.965
18	2.000	3.347	-1.347	67.373	0.946
19	2.000	1.809	0.191	9.568	0.963
20	3.000	2.992	0.008	0.253	0.965
21	4.000	3.751	0.249	6.233	0.964
22	5.250	4.276	0.974	18.559	0.949
23	4.750	3.877	0.873	18.387	0.956
24	1.000	2.358	-1.358	135.758	0.945
25	3.000	2.256	0.744	24.802	0.958
26	4.000	4.525	-0.525	13.131	0.961
27	5.500	3.563	1.937	35.224	0.939
28	2.000	4.270	-2.270	113.506	0.934
29	1.750	3.990	-2.240	128.016	0.931
30	5.250	4.830	0.420	8.007	0.962
31	2.000	2.921	-0.921	46.062	0.955
32	5.000	3.237	1.763	35.263	0.941
33	3.000	3.584	-0.584	19.460	0.961
34	4.250	3.618	0.632	14.875	0.960
35	3.500	3.326	0.174	4.958	0.965
36	5.500	4.412	1.088	19.790	0.944
37	2.250	3.682	-1.432	63.623	0.943
38	3.250	3.123	0.127	3.912	0.965
39	3.500	3.873	-0.373	10.654	0.963
40	2.500	1.918	0.582	23.266	0.960
41	3.000	3.354	-0.354	11.799	0.963
42	4.750	4.089	0.661	13.923	0.960
43	4.000	4.457	-0.457	11.416	0.962
44	7.000	4.342	2.658	37.969	0.929
45	2.750	2.703	0.047	1.698	0.965
46	2.000	2.708	-0.708	35.409	0.958
47	2.250	2.879	-0.629	27.937	0.960

Robust Multiple Regression Using Huber's Method (C=1.345)

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Database D:\FRANCOIS BACKUP\MY DOCUME ... SS\DATA ANALYSIS_27092009.S0
Dependent Rent
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Residual Report

Row	Actual Rent	Predicted Rent	Residual	Absolute Percent Error	Sqrt(MSE) Without This Row
48	3.250	4.170	-0.920	28.313	0.954
49	1.750	3.510	-1.760	100.597	0.941
50	4.500	3.401	1.099	24.415	0.937
51	1.000	2.179	-1.179	117.874	0.942
52	3.500	3.679	-0.179	5.112	0.964
53	2.250	2.547	-0.297	13.203	0.964
54	4.750	4.992	-0.242	5.092	0.964
55	3.000	2.664	0.336	11.192	0.964
56	3.750	3.406	0.344	9.165	0.964
57	4.000	3.738	0.262	6.545	0.964
58	3.250	3.270	-0.020	0.619	0.965
59	4.000	4.004	-0.004	0.099	0.965
60	2.750	3.599	-0.849	30.882	0.953
61	4.750	4.556	0.194	4.092	0.964
62	3.250	3.606	-0.356	10.940	0.963
63	4.500	4.271	0.229	5.097	0.964

Robust Multiple Regression Using Huber's Method (C=1.345)

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Database D:\FRANCOIS BACKUP\MY DOCUME ... SS\DATA ANALYSIS_27092009.S0
Dependent Rent
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Regression Diagnostics Section

Row	Standardized Residual	RStudent	Hat Diagonal	Cook's D	Dffits	CovRatio
1	-1.0676	-1.0691	0.1301	0.0142	-0.4135	1.1116
2	0.8814	0.8795	0.2212	0.0184	0.4687	1.3544
3	-2.1762	-2.2197	0.0990	0.0269	-0.7356	0.6909
4	-0.5320	-0.5282	0.1208	0.0032	-0.1958	1.3493
5	1.7726	1.7976	0.0928	0.0203	0.5748	0.7871
6	0.9982	0.9982	0.1636	0.0162	0.4414	1.1966
7	-0.5423	-0.5385	0.1773	0.0053	-0.2500	1.4383
8	-0.4219	-0.4185	0.1880	0.0034	-0.2014	1.4977
9	0.7539	0.7506	0.3250	0.0228	0.5209	1.6425
10	0.4913	0.4876	0.0633	0.0014	0.1267	1.2790
11	1.5667	1.5897	0.3222	0.0966	1.0961	1.0397
12	2.0919	2.1305	0.0802	0.0203	0.6291	0.7013
13	0.8236	0.8210	0.1293	0.0084	0.3164	1.2404
14	-0.6867	-0.6831	0.1032	0.0045	-0.2317	1.2650
15	-0.5667	-0.5629	0.1059	0.0032	-0.1938	1.3149
16	0.8302	0.8277	0.0846	0.0053	0.2517	1.1767
17	-0.1922	-0.1904	0.0875	0.0003	-0.0590	1.3779
18	-1.4869	-1.5021	0.1003	0.0187	-0.5016	0.8705
19	0.4463	0.4427	0.7985	0.0658	0.8815	6.0068
20	0.0083	0.0082	0.0766	0.0000	0.0024	1.3734
21	0.2919	0.2893	0.2006	0.0018	0.1449	1.5550
22	1.2840	1.2924	0.3691	0.0804	0.9886	1.3553
23	0.9667	0.9661	0.1058	0.0092	0.3323	1.1360
24	-1.5236	-1.5406	0.1302	0.0261	-0.5962	0.8820
25	0.8545	0.8522	0.1693	0.0124	0.3847	1.2841
26	-0.6607	-0.6570	0.3076	0.0162	-0.4379	1.6522
27	2.0827	2.1199	0.0521	0.0125	0.4969	0.6897
28	-2.4531	-2.5100	0.0618	0.0178	-0.6440	0.6143
29	-2.5531	-2.6211	0.1565	0.0550	-1.1290	0.6309
30	0.5788	0.5750	0.4221	0.0204	0.4914	2.0275
31	-1.0436	-1.0446	0.1464	0.0156	-0.4325	1.1466
32	1.8905	1.9191	0.0470	0.0102	0.4264	0.7316
33	-0.6742	-0.6706	0.1786	0.0082	-0.3127	1.3868
34	0.7022	0.6986	0.1119	0.0052	0.2480	1.2709
35	0.1932	0.1914	0.1163	0.0004	0.0694	1.4227
36	1.4755	1.4932	0.4038	0.1229	1.2289	1.2603
37	-1.6458	-1.6679	0.1712	0.0398	-0.7580	0.8762
38	0.1540	0.1525	0.2529	0.0007	0.0887	1.6880
39	-0.4434	-0.4399	0.2252	0.0048	-0.2372	1.5628
40	0.6959	0.6923	0.2346	0.0124	0.3833	1.4777
41	-0.4086	-0.4052	0.1777	0.0030	-0.1883	1.4827
42	0.7471	0.7439	0.1416	0.0077	0.3021	1.2947
43	-0.5688	-0.5650	0.2940	0.0112	-0.3646	1.6643
44	2.8525	2.9342	0.0489	0.0160	0.6652	0.5338
45	0.0530	0.0525	0.1500	0.0000	0.0220	1.4910
46	-0.8601	-0.8579	0.2573	0.0214	-0.5049	1.4330
47	-0.7503	-0.7470	0.2310	0.0141	-0.4094	1.4435
48	-1.0823	-1.0841	0.2080	0.0256	-0.5556	1.2117

Robust Multiple Regression Using Huber's Method (C=1.345)

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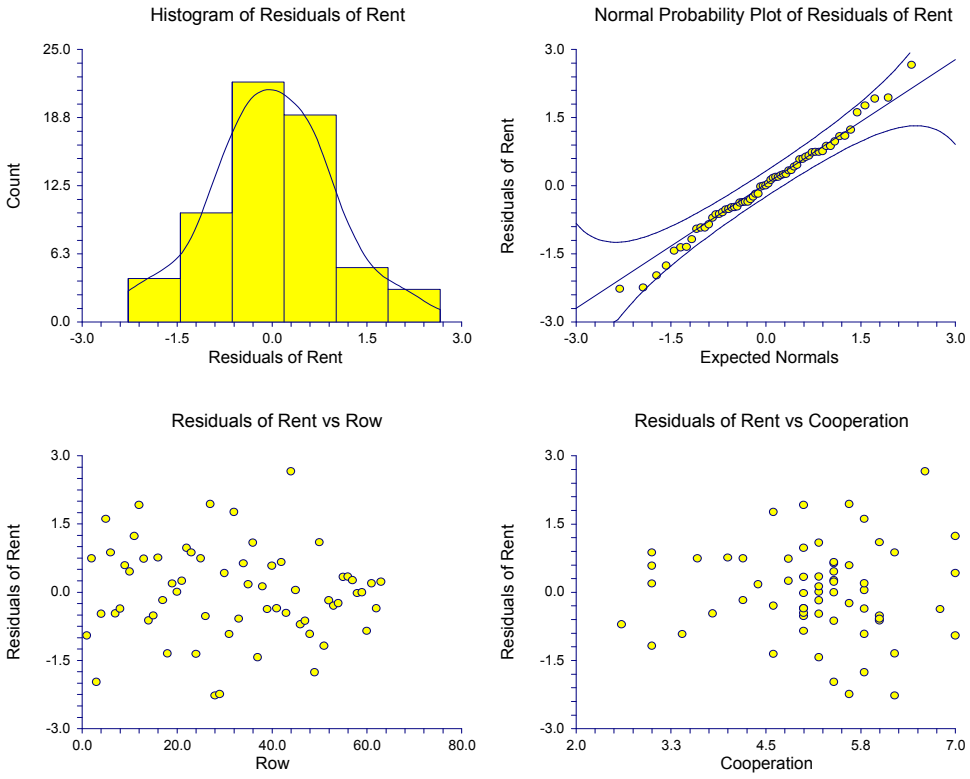
Dependent Rent
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Regression Diagnostics Section

Row	Standardized Residual	RStudent	Hat Diagonal	Cook's D	Dffits	CovRatio
49	-1.8930	-1.9218	0.0525	0.0115	-0.4523	0.7339
50	1.7095	1.7434	0.5475	0.2947	1.9177	1.3806
51	-1.5560	-1.5786	0.3713	0.1191	-1.2131	1.1253
52	-0.2120	-0.2100	0.2195	0.0011	-0.1113	1.6077
53	-0.3479	-0.3449	0.2011	0.0025	-0.1730	1.5428
54	-0.2986	-0.2959	0.2811	0.0029	-0.1850	1.7274
55	0.3670	0.3638	0.0827	0.0010	0.1093	1.3395
56	0.3702	0.3671	0.0560	0.0007	0.0894	1.3007
57	0.2968	0.2941	0.1472	0.0013	0.1222	1.4567
58	-0.0218	-0.0216	0.0661	0.0000	-0.0057	1.3579
59	-0.0044	-0.0044	0.1171	0.0000	-0.0016	1.4365
60	-1.1008	-1.1031	0.3479	0.0539	-0.8058	1.4574
61	0.2328	0.2307	0.2366	0.0014	0.1284	1.6402
62	-0.4339	-0.4304	0.2643	0.0056	-0.2580	1.6491
63	0.2632	0.2608	0.1680	0.0012	0.1172	1.4997

Plots Section



Robust Multiple Regression Using Huber's Method (C=1.345)

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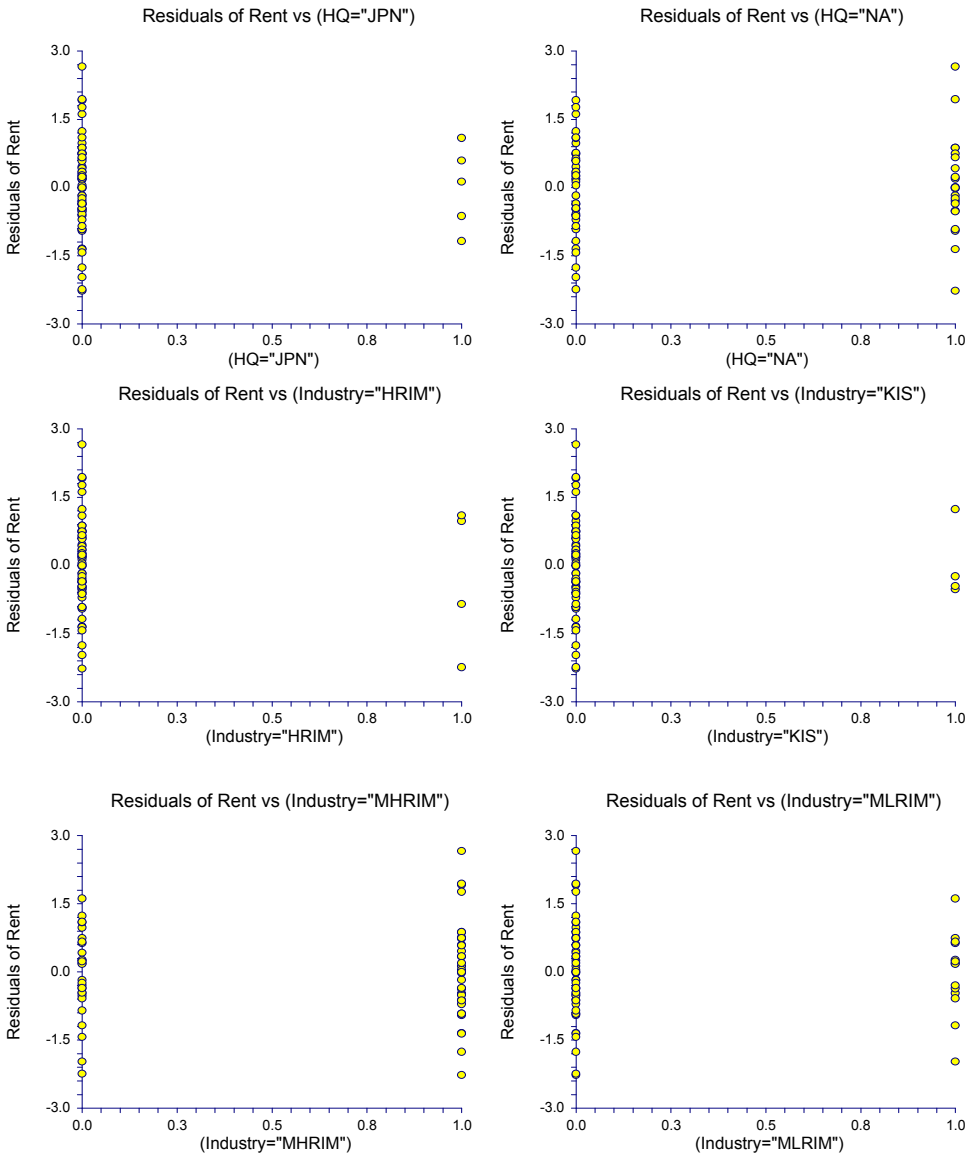
Database D:\FRANCOIS BACKUP\MY DOCUME ... SS\DATA ANALYSIS_27092009.S0
Dependent Rent
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.



Robust Multiple Regression Using Huber's Method (C=1.345)

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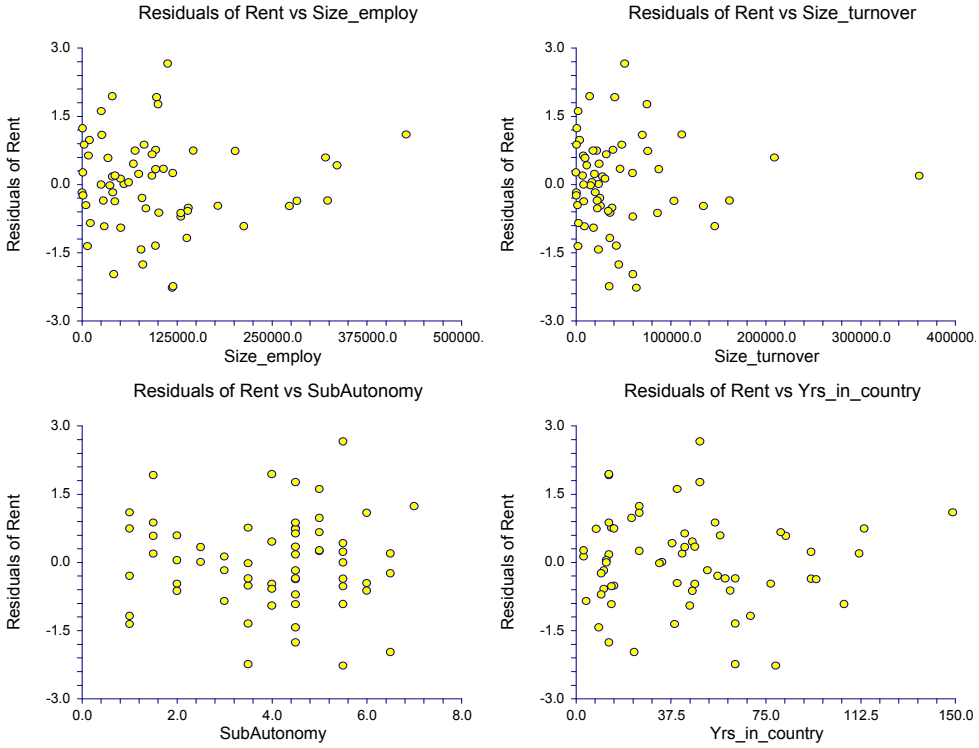
Database D:\FRANCOIS BACKUP\MY DOCUME ... SS\DATA ANALYSIS_27092009.S0
Dependent Rent
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.



Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent

Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Rent	Rows Processed	63
Number Ind. Variables	2	Rows Filtered Out	0
Weight Variable	None	Rows with X's Missing	0
R2	0.3975	Rows with Weight Missing	0
Adj R2	0.3775	Rows with Y Missing	0
Coefficient of Variation	0.2577	Rows Used in Estimation	63
Mean Square Error	0.7911067	Sum of Weights	58.367
Square Root of MSE	0.8894418	Completion Status	Normal
Completion			
Ave Abs Pct Error	27.148		

Descriptive Statistics Section

Variable	Count	Mean	Standard Deviation	Minimum	Maximum
Cooperation	63	5.100653	0.9751758	2.6	7
SubAutonomy	63	3.941904	1.541895	1	7
Rent	63	3.450971	1.127277	1	7

Regression Equation Section

Independent Variable	Regression Coefficient b(i)	Standard Error Sb(i)	T-Value to test H0:B(i)=0	Prob Level	Reject H0 at 5%?	Power of Test at 5%
Intercept	0.6383	0.6025	1.059	0.2937	No	0.1808
Cooperation	0.2789	0.1303	2.140	0.0364	Yes	0.5579
SubAutonomy	0.3527	0.0824	4.280	0.0001	Yes	0.9878

Estimated Model

.638339372653477+ .278850396663218*Cooperation+ .352700809444643*SubAutonomy

Regression Coefficient Section

Independent Variable	Regression Coefficient	Standard Error	Lower 95% C.L.	Upper 95% C.L.	Standardized Coefficient
Intercept	0.6383	0.6025	-0.5669	1.8436	0.0000
Cooperation	0.2789	0.1303	0.0182	0.5395	0.2412
SubAutonomy	0.3527	0.0824	0.1878	0.5176	0.4824

Note: The T-Value used to calculate these confidence limits was 2.000.

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent

Robust Regression Coefficients Section

Robust Iteration	Max % Change in any Beta	Robust B(0)	Robust B(1)	Robust	Robust
0	100.000	0.5959	0.3113		
1	7.290	0.6208	0.2891		
2	2.434	0.6307	0.2821		
3	0.787	0.6353	0.2799		
4	0.294	0.6372	0.2792		
5	0.106	0.6379	0.2790		
6	0.042	0.6381	0.2789		
7	0.017	0.6383	0.2789		
8	0.007	0.6383	0.2789		
9	0.003	0.6383	0.2789		
10	0.001	0.6383	0.2789		

Robust Percentiles of Residuals Section

Iter. No.	Max % Change in any Beta	Percentiles of Absolute Residuals 25th	50th	75th	100th
0	100.000	0.184	0.663	1.350	2.577
1	7.290	0.185	0.624	1.296	2.569
2	2.434	0.191	0.622	1.280	2.575
3	0.787	0.194	0.621	1.275	2.579
4	0.294	0.195	0.620	1.274	2.580
5	0.106	0.195	0.620	1.274	2.581
6	0.042	0.195	0.620	1.274	2.581
7	0.017	0.195	0.620	1.274	2.581
8	0.007	0.195	0.620	1.274	2.581
9	0.003	0.195	0.620	1.274	2.581
10	0.001	0.195	0.620	1.274	2.581

Analysis of Variance Section

Source	DF	R2	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1		695.1102	695.1102			
Model	2	0.3975	31.32036	15.66018	19.795	0.0000	0.9999
Error	60	0.6025	47.4664	0.7911067			
Total(Adjusted)	62	1.0000	78.78676	1.270754			

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent

Analysis of Variance Detail Section

Model Term	DF	R2	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1		695.1102	695.1102			
Model	2	0.3975	31.32036	15.66018	19.795	0.0000	0.9999
Cooperation	1	0.0460	3.622709	3.622709	4.579	0.0364	0.5579
SubAutonomy	1	0.1839	14.4893	14.4893	18.315	0.0001	0.9878
Error	60	0.6025	47.4664	0.7911067			
Total(Adjusted)	62	1.0000	78.78676	1.270754			

PRESS Section

Parameter	From PRESS Residuals	From Regular Residuals
Sum of Squared Residuals	71.04529	47.4664
Sum of |Residuals|	51.17119	48.71286
R2	0.0983	0.3975

Normality Tests Section

Test Name	Test Value	Prob Level	Reject H0 At Alpha = 20%?
Shapiro Wilk	0.9882	0.807178	No
Anderson Darling	0.3060	0.565946	No
D'Agostino Skewness	0.0411	0.967230	No
D'Agostino Kurtosis	0.3548	0.722775	No
D'Agostino Omnibus	0.1275	0.938222	No

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent

Robust Residuals and Weights

Row	Actual Rent	Predicted Rent	Residual	Absolute Percent Error	Robust Weight
1	3.000	4.001	-1.001	33.370	1.0000
2	4.000	3.229	0.771	19.266	1.0000
3	2.250	4.437	-2.187	97.186	0.5400
4	2.750	3.499	-0.749	27.242	1.0000
5	5.500	4.019	1.481	26.924	0.7974
6	3.000	2.004	0.996	33.202	1.0000
7	2.000	2.403	-0.403	20.169	1.0000
8	3.750	4.196	-0.446	11.881	1.0000
9	3.500	2.905	0.595	16.991	1.0000
10	3.750	3.555	0.195	5.202	1.0000
11	6.500	5.059	1.441	22.166	0.8196
12	4.250	2.562	1.688	39.726	0.6994
13	4.000	3.564	0.436	10.901	1.0000
14	3.500	4.428	-0.928	26.504	1.0000
15	3.000	3.546	-0.546	18.196	1.0000
16	3.500	2.988	0.512	14.623	1.0000
17	2.750	2.868	-0.118	4.277	1.0000
18	2.000	3.602	-1.602	80.083	0.7373
19	2.000	2.004	-0.004	0.197	1.0000
20	3.000	2.970	0.030	0.996	1.0000
21	4.000	3.740	0.260	6.492	1.0000
22	5.250	3.796	1.454	27.693	0.8122
23	4.750	3.954	0.796	16.750	1.0000
24	1.000	2.274	-1.274	127.375	0.9271
25	3.000	2.162	0.838	27.926	1.0000
26	4.000	3.972	0.028	0.689	1.0000
27	5.500	3.611	1.889	34.351	0.6250
28	2.000	4.307	-2.307	115.353	0.5118
29	1.750	3.434	-1.684	96.249	0.7011
30	5.250	4.530	0.720	13.711	1.0000
31	2.000	3.174	-1.174	58.679	1.0000
32	5.000	3.508	1.492	29.836	0.7916
33	3.000	3.722	-0.722	24.075	1.0000
34	4.250	3.731	0.519	12.205	1.0000
35	3.500	3.452	0.048	1.359	1.0000
36	5.500	4.205	1.295	23.553	0.9116
37	2.250	3.676	-1.426	63.356	0.8284
38	3.250	3.146	0.104	3.186	1.0000
39	3.500	4.122	-0.622	17.762	1.0000
40	2.500	2.004	0.496	19.842	1.0000
41	3.000	3.620	-0.620	20.658	1.0000
42	4.750	3.908	0.842	17.734	1.0000
43	4.000	4.149	-0.149	3.720	1.0000
44	7.000	4.419	2.581	36.877	0.4575
45	2.750	2.961	-0.211	7.675	1.0000
46	2.000	2.951	-0.951	47.525	1.0000
47	2.250	2.850	-0.600	26.646	1.0000
48	3.250	4.196	-0.946	29.093	1.0000

Robust Multiple Regression Using Huber's Method (C=1.345)

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Robust Residuals and Weights

Row	Actual Rent	Predicted Rent	Residual	Absolute Percent Error	Robust Weight
49	1.750	3.843	-2.093	119.590	0.5642
50	4.500	2.664	1.836	40.797	0.6432
51	1.000	1.828	-0.828	82.759	1.0000
52	3.500	3.676	-0.176	5.015	1.0000
53	2.250	2.274	-0.024	1.056	1.0000
54	4.750	4.492	0.258	5.422	1.0000
55	3.000	2.914	0.086	2.855	1.0000
56	3.750	3.676	0.074	1.986	1.0000
57	4.000	3.908	0.092	2.309	1.0000
58	3.250	3.267	-0.017	0.524	1.0000
59	4.000	4.084	-0.084	2.100	1.0000
60	2.750	3.091	-0.341	12.389	1.0000
61	4.750	4.548	0.202	4.248	1.0000
62	3.250	3.267	-0.017	0.524	1.0000
63	4.500	4.084	0.416	9.245	1.0000

Robust Multiple Regression Using Huber's Method (C=1.345)

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Predicted Values with Confidence Limits of Means

Row	Actual Rent	Predicted Rent	Standard Error of Predicted	95% Lower Conf. Limit of Mean	95% Upper Conf. Limit of Mean
1	3.000	4.001	0.272	3.458	4.544
2	4.000	3.229	0.249	2.731	3.728
3	2.250	4.437	0.168	4.102	4.772
4	2.750	3.499	0.117	3.265	3.733
5	5.500	4.019	0.133	3.753	4.285
6	3.000	2.004	0.280	1.443	2.564
7	2.000	2.403	0.207	1.988	2.818
8	3.750	4.196	0.166	3.863	4.528
9	3.500	2.905	0.230	2.445	3.366
10	3.750	3.555	0.122	3.311	3.799
11	6.500	5.059	0.258	4.543	5.575
12	4.250	2.562	0.190	2.181	2.942
13	4.000	3.564	0.137	3.289	3.839
14	3.500	4.428	0.195	4.038	4.817
15	3.000	3.546	0.180	3.185	3.907
16	3.500	2.988	0.175	2.638	3.338
17	2.750	2.868	0.158	2.551	3.184
18	2.000	3.602	0.172	3.257	3.946
19	2.000	2.004	0.280	1.443	2.564
20	3.000	2.970	0.171	2.628	3.312
21	4.000	3.740	0.161	3.419	4.062
22	5.250	3.796	0.135	3.526	4.066
23	4.750	3.954	0.174	3.607	4.302
24	1.000	2.274	0.240	1.794	2.754
25	3.000	2.162	0.245	1.672	2.652
26	4.000	3.972	0.178	3.616	4.329
27	5.500	3.611	0.105	3.401	3.820
28	2.000	4.307	0.131	4.044	4.570
29	1.750	3.434	0.122	3.190	3.679
30	5.250	4.530	0.249	4.031	5.029
31	2.000	3.174	0.272	2.629	3.718
32	5.000	3.508	0.134	3.240	3.776
33	3.000	3.722	0.164	3.395	4.050
34	4.250	3.731	0.125	3.482	3.981
35	3.500	3.452	0.167	3.119	3.786
36	5.500	4.205	0.192	3.820	4.589
37	2.250	3.676	0.113	3.450	3.901
38	3.250	3.146	0.144	2.859	3.434
39	3.500	4.122	0.235	3.651	4.592
40	2.500	2.004	0.280	1.443	2.564
41	3.000	3.620	0.128	3.364	3.876
42	4.750	3.908	0.140	3.628	4.187
43	4.000	4.149	0.211	3.727	4.571
44	7.000	4.419	0.144	4.131	4.706
45	2.750	2.961	0.247	2.468	3.454
46	2.000	2.951	0.368	2.214	3.687
47	2.250	2.850	0.215	2.419	3.280
48	3.250	4.196	0.166	3.863	4.528

Robust Multiple Regression Using Huber's Method (C=1.345)

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Predicted Values with Confidence Limits of Means

Row	Actual Rent	Predicted Rent	Standard Error of Predicted	95% Lower Conf. Limit of Mean	95% Upper Conf. Limit of Mean
49	1.750	3.843	0.107	3.630	4.056
50	4.500	2.664	0.269	2.127	3.201
51	1.000	1.828	0.294	1.239	2.416
52	3.500	3.676	0.124	3.428	3.923
53	2.250	2.274	0.249	1.775	2.772
54	4.750	4.492	0.223	4.047	4.938
55	3.000	2.914	0.163	2.589	3.239
56	3.750	3.676	0.124	3.428	3.923
57	4.000	3.908	0.140	3.628	4.187
58	3.250	3.267	0.121	3.025	3.509
59	4.000	4.084	0.164	3.755	4.413
60	2.750	3.091	0.137	2.816	3.365
61	4.750	4.548	0.221	4.107	4.990
62	3.250	3.267	0.121	3.025	3.509
63	4.500	4.084	0.164	3.755	4.413

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent

Residual Report

Row	Actual Rent	Predicted Rent	Residual	Absolute Percent Error	Sqrt(MSE) Without This Row
1	3.000	4.001	-1.001	33.370	0.886
2	4.000	3.229	0.771	19.266	0.891
3	2.250	4.437	-2.187	97.186	0.871
4	2.750	3.499	-0.749	27.242	0.892
5	5.500	4.019	1.481	26.924	0.880
6	3.000	2.004	0.996	33.202	0.886
7	2.000	2.403	-0.403	20.169	0.895
8	3.750	4.196	-0.446	11.881	0.895
9	3.500	2.905	0.595	16.991	0.893
10	3.750	3.555	0.195	5.202	0.897
11	6.500	5.059	1.441	22.166	0.879
12	4.250	2.562	1.688	39.726	0.877
13	4.000	3.564	0.436	10.901	0.895
14	3.500	4.428	-0.928	26.504	0.888
15	3.000	3.546	-0.546	18.196	0.894
16	3.500	2.988	0.512	14.623	0.894
17	2.750	2.868	-0.118	4.277	0.897
18	2.000	3.602	-1.602	80.083	0.878
19	2.000	2.004	-0.004	0.197	0.897
20	3.000	2.970	0.030	0.996	0.897
21	4.000	3.740	0.260	6.492	0.896
22	5.250	3.796	1.454	27.693	0.880
23	4.750	3.954	0.796	16.750	0.891
24	1.000	2.274	-1.274	127.375	0.881
25	3.000	2.162	0.838	27.926	0.890
26	4.000	3.972	0.028	0.689	0.897
27	5.500	3.611	1.889	34.351	0.875
28	2.000	4.307	-2.307	115.353	0.870
29	1.750	3.434	-1.684	96.249	0.878
30	5.250	4.530	0.720	13.711	0.892
31	2.000	3.174	-1.174	58.679	0.882
32	5.000	3.508	1.492	29.836	0.880
33	3.000	3.722	-0.722	24.075	0.892
34	4.250	3.731	0.519	12.205	0.894
35	3.500	3.452	0.048	1.359	0.897
36	5.500	4.205	1.295	23.553	0.882
37	2.250	3.676	-1.426	63.356	0.881
38	3.250	3.146	0.104	3.186	0.897
39	3.500	4.122	-0.622	17.762	0.893
40	2.500	2.004	0.496	19.842	0.894
41	3.000	3.620	-0.620	20.658	0.893
42	4.750	3.908	0.842	17.734	0.890
43	4.000	4.149	-0.149	3.720	0.897
44	7.000	4.419	2.581	36.877	0.867
45	2.750	2.961	-0.211	7.675	0.896
46	2.000	2.951	-0.951	47.525	0.887
47	2.250	2.850	-0.600	26.646	0.893
48	3.250	4.196	-0.946	29.093	0.888

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent

Residual Report

Row	Actual Rent	Predicted Rent	Residual	Absolute Percent Error	Sqrt(MSE) Without This Row
49	1.750	3.843	-2.093	119.590	0.873
50	4.500	2.664	1.836	40.797	0.874
51	1.000	1.828	-0.828	82.759	0.890
52	3.500	3.676	-0.176	5.015	0.897
53	2.250	2.274	-0.024	1.056	0.897
54	4.750	4.492	0.258	5.422	0.896
55	3.000	2.914	0.086	2.855	0.897
56	3.750	3.676	0.074	1.986	0.897
57	4.000	3.908	0.092	2.309	0.897
58	3.250	3.267	-0.017	0.524	0.897
59	4.000	4.084	-0.084	2.100	0.897
60	2.750	3.091	-0.341	12.389	0.896
61	4.750	4.548	0.202	4.248	0.897
62	3.250	3.267	-0.017	0.524	0.897
63	4.500	4.084	0.416	9.245	0.895

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Rent

Regression Diagnostics Section

Row	Standardized Residual	RStudent	Hat Diagonal	Cook's D	Dffits	CovRatio
1	-1.1820	-1.1860	0.0932	0.0479	-0.3803	1.0807
2	0.9026	0.9012	0.0786	0.0232	0.2631	1.0955
3	-2.5033	-2.5555	0.0355	0.0415	-0.4902	0.9161
4	-0.8497	-0.8477	0.0173	0.0042	-0.1125	1.0321
5	1.6838	1.7021	0.0224	0.0172	0.2574	0.9587
6	1.1800	1.1839	0.0993	0.0511	0.3930	1.0882
7	-0.4664	-0.4633	0.0544	0.0042	-0.1111	1.1002
8	-0.5099	-0.5067	0.0349	0.0031	-0.0964	1.0757
9	0.6922	0.6891	0.0669	0.0115	0.1846	1.1004
10	0.2214	0.2196	0.0189	0.0003	0.0305	1.0693
11	1.6926	1.7123	0.0841	0.0719	0.5189	1.0187
12	1.9432	1.9709	0.0458	0.0423	0.4318	0.9630
13	0.4962	0.4930	0.0238	0.0020	0.0770	1.0642
14	-1.0688	-1.0701	0.0478	0.0191	-0.2399	1.0427
15	-0.6268	-0.6236	0.0411	0.0056	-0.1291	1.0754
16	0.5869	0.5837	0.0388	0.0046	0.1172	1.0754
17	-0.1344	-0.1333	0.0316	0.0002	-0.0241	1.0851
18	-1.8354	-1.8590	0.0374	0.0322	-0.3667	0.9625
19	-0.0047	-0.0046	0.0993	0.0000	-0.0015	1.1676
20	0.0342	0.0340	0.0370	0.0000	0.0067	1.0920
21	0.2968	0.2946	0.0326	0.0010	0.0541	1.0824
22	1.6537	1.6711	0.0230	0.0174	0.2563	0.9613
23	0.9121	0.9108	0.0381	0.0110	0.1813	1.0485
24	-1.4872	-1.5006	0.0728	0.0536	-0.4204	1.0219
25	0.9798	0.9795	0.0759	0.0263	0.2807	1.0843
26	0.0316	0.0314	0.0401	0.0000	0.0064	1.0956
27	2.1390	2.1735	0.0138	0.0134	0.2575	0.9211
28	-2.6226	-2.6805	0.0218	0.0262	-0.4003	0.8968
29	-1.9118	-1.9377	0.0189	0.0164	-0.2687	0.9404
30	0.8431	0.8411	0.0786	0.0202	0.2457	1.1013
31	-1.3860	-1.3969	0.0937	0.0662	-0.4491	1.0525
32	1.6966	1.7153	0.0227	0.0176	0.2613	0.9581
33	-0.8261	-0.8239	0.0339	0.0080	-0.1543	1.0519
34	0.5890	0.5858	0.0197	0.0023	0.0829	1.0543
35	0.0544	0.0540	0.0352	0.0000	0.0103	1.0899
36	1.4917	1.5048	0.0466	0.0331	0.3329	0.9950
37	-1.6157	-1.6319	0.0160	0.0117	-0.2082	0.9574
38	0.1180	0.1170	0.0261	0.0001	0.0192	1.0792
39	-0.7248	-0.7219	0.0700	0.0132	-0.1980	1.1014
40	0.5876	0.5844	0.0993	0.0127	0.1940	1.1476
41	-0.7041	-0.7011	0.0207	0.0035	-0.1020	1.0476
42	0.9590	0.9584	0.0247	0.0078	0.1526	1.0295
43	-0.1722	-0.1708	0.0563	0.0006	-0.0417	1.1128
44	2.9410	3.0176	0.0262	0.0354	0.4945	0.8801
45	-0.2470	-0.2451	0.0769	0.0017	-0.0707	1.1359
46	-1.1740	-1.1778	0.1714	0.0950	-0.5356	1.1838
47	-0.6947	-0.6917	0.0587	0.0100	-0.1727	1.0905
48	-1.0821	-1.0837	0.0349	0.0141	-0.2061	1.0272
49	-2.3700	-2.4149	0.0144	0.0154	-0.2915	0.9067

Robust Multiple Regression Using Huber's Method (C=1.345)

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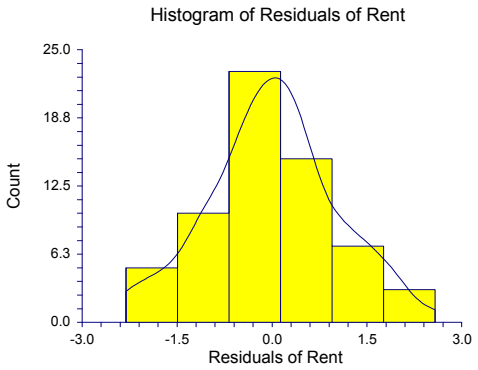
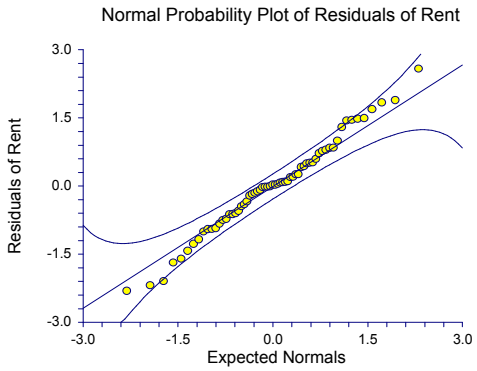
Dependent Rent

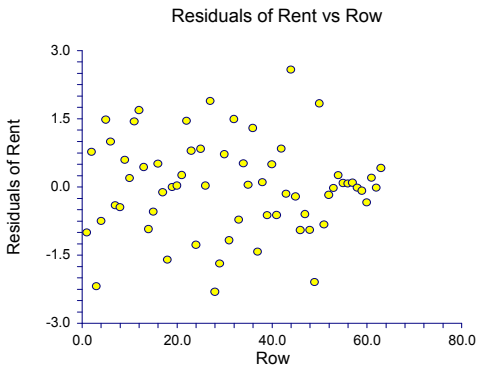
Regression Diagnostics Section

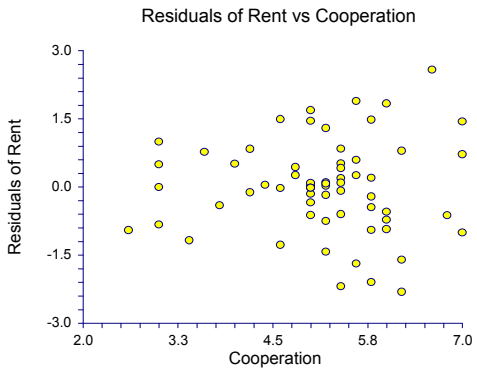
Row	Standardized Residual	RStudent	Hat Diagonal	Cook's D	Dffits	CovRatio
50	2.1651	2.2030	0.0911	0.1008	0.6977	0.9914
51	-0.9859	-0.9857	0.1093	0.0398	-0.3453	1.1243
52	-0.1993	-0.1977	0.0193	0.0003	-0.0278	1.0703
53	-0.0278	-0.0276	0.0785	0.0000	-0.0081	1.1413
54	0.2991	0.2968	0.0628	0.0020	0.0768	1.1172
55	0.0980	0.0971	0.0334	0.0001	0.0181	1.0875
56	0.0846	0.0839	0.0193	0.0000	0.0118	1.0721
57	0.1052	0.1043	0.0247	0.0001	0.0166	1.0778
58	-0.0193	-0.0192	0.0185	0.0000	-0.0026	1.0715
59	-0.0961	-0.0953	0.0341	0.0001	-0.0179	1.0883
60	-0.3877	-0.3849	0.0238	0.0012	-0.0601	1.0693
61	0.2342	0.2323	0.0616	0.0012	0.0595	1.1176
62	-0.0193	-0.0192	0.0185	0.0000	-0.0026	1.0715
63	0.4759	0.4728	0.0341	0.0027	0.0888	1.0766

Plots Section









Robust Multiple Regression Using Huber's Method (C=1.345)

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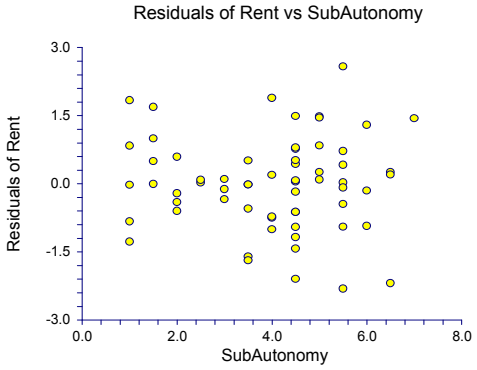
Dependent	Rent



Appendix E: Regression Report (Hypothesis 2)

Robust Multiple Regression Using Huber's Method (C=1.345)

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Database D:\FRANCOIS BACKUP\MY DOCUME ... L INFORMATION\NCSS\LATEST.S0
Dependent Dom_MS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Dom_MS_Incr	Rows Processed	63
Number Ind. Variables	14	Rows Filtered Out	0
Weight Variable	None	Rows with X's Missing	0
R2	0.6855	Rows with Weight Missing	0
Adj R2	0.5937	Rows with Y Missing	0
Coefficient of Variation	0.1700	Rows Used in Estimation	63
Mean Square Error	0.7696797	Sum of Weights	55.456
Square Root of MSE	0.8773139	Completion Status	Normal
Completion			
Ave Abs Pct Error	31.400		

Descriptive Statistics Section

Variable	Count	Mean	Standard Deviation	Minimum	Maximum
Competition	63	4.21721	1.052876	1	6.333333
Cooperation	63	5.180562	0.912852	2.6	7
Coopetition	63	4.608512	0.7664191	2.280351	6.266312
(HQ="JPN")	63	9.016214E-02	0.2708764	0	1
(HQ="NA")	63	0.34921	0.4508591	0	1
(Industry="HRIM")	63	6.596103E-02	0.2347487	0	1
(Industry="KIS")	63	0.0509286	0.2079253	0	1
(Industry="MHRIM")	63	0.5466367	0.4708143	0	1
(Industry="MLRIM")	63	0.2282791	0.3969541	0	1
Rent	63	3.445712	1.135636	1	7
Size_employ	63	99673.34	90056.8	21	427000
Size_turnover	63	46951.81	57846.55	0.7919124	362064
SubAutonomy	63	3.975943	1.508409	1	7
Yrs_in_country	63	44.24105	30.59592	3	149
Dom_MS_Incr	63	5.161507	1.376416	1	7

Robust Multiple Regression Using Huber's Method (C=1.345)

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Database D:\FRANCOIS BACKUP\MY DOCUME ... L INFORMATION\NCSS\LATEST.S0
Dependent Dom_MS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Regression Equation Section

Independent Variable	Regression Coefficient b(i)	Standard Error Sb(i)	T-Value to test H0:B(i)=0	Prob Level	Reject H0 at 5%?	Power of Test at 5%
Intercept	2.9226	0.9365	3.121	0.0031	Yes	0.8638
Competition	-2.8423	0.7868	-3.612	0.0007	Yes	0.9429
Cooperation	-0.9969	0.6044	-1.650	0.1056	No	0.3658
Coopetition	4.3569	1.3065	3.335	0.0017	Yes	0.9044
(HQ="JPN")	-2.1564	0.4758	-4.532	0.0000	Yes	0.9934
(HQ="NA")	0.0046	0.2980	0.016	0.9876	No	0.0500
(Industry="HRIM")	0.1096	0.6544	0.167	0.8677	No	0.0531
(Industry="KIS")	-0.2205	0.6896	-0.320	0.7506	No	0.0613
(Industry="MHRIM")	0.0615	0.4428	0.139	0.8901	No	0.0521
(Industry="MLRIM")	0.0329	0.4951	0.066	0.9473	No	0.0505
Rent	-0.2394	0.1307	-1.831	0.0733	No	0.4344
Size_employ	0.0000	0.0000	0.000	1.0000	No	0.0500
Size_turnover	0.0000	0.0000	0.000	1.0000	No	0.0500
SubAutonomy	-0.0234	0.1079	-0.217	0.8291	No	0.0552
Yrs_in_country	0.0009	0.0044	0.195	0.8461	No	0.0542

Estimated Model

2.92260929663638-2.84227112067477*Competition-.99694981352586*Cooperation+ 4.35691905138245*Coopetition-2.15637577038537*(HQ="JPN")+ 4.64283036361981E-03*(HQ="NA")+ .109613191356399*(Industry="HRIM")-.220452639927391*(Industry="KIS")+ 6.15057556813568E-02*(Industry="MHRIM")+ 3.28932745689017E-02*(Industry="MLRIM")-.239442699335195*Rent+ 2.1225140599367E-06*Size_employ+ 2.88795488913871E-06*Size_turnover-2.34217947010345E-02*SubAutonomy+ 8.56462019083737E-04*Yrs_in_country

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Dom_MS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Regression Coefficient Section

Independent Variable	Regression Coefficient	Standard Error	Lower 95% C.L.	Upper 95% C.L.	Standardized Coefficient
Intercept	2.9226	0.9365	1.0396	4.8056	0.0000
Competition	-2.8423	0.7868	-4.4243	-1.2602	-2.1742
Cooperation	-0.9969	0.6044	-2.2121	0.2182	-0.6612
Coopetition	4.3569	1.3065	1.7299	6.9839	2.4260
(HQ="JPN")	-2.1564	0.4758	-3.1131	-1.1997	-0.4244
(HQ="NA")	0.0046	0.2980	-0.5944	0.6037	0.0015
(Industry="HRIM")	0.1096	0.6544	-1.2062	1.4254	0.0187
(Industry="KIS")	-0.2205	0.6896	-1.6070	1.1661	-0.0333
(Industry="MHRIM")	0.0615	0.4428	-0.8287	0.9517	0.0210
(Industry="MLRIM")	0.0329	0.4951	-0.9626	1.0284	0.0095
Rent	-0.2394	0.1307	-0.5023	0.0234	-0.1976
Size_employ	0.0000	0.0000			0.1389
Size_turnover	0.0000	0.0000			0.1214
SubAutonomy	-0.0234	0.1079	-0.2405	0.1936	-0.0257
Yrs_in_country	0.0009	0.0044	-0.0080	0.0097	0.0190

Note: The T-Value used to calculate these confidence limits was 2.011.

Robust Regression Coefficients Section

Robust Iteration	Max % Change in any Beta	Robust B(0)	Robust B(1)	Robust B(2)	Robust B(3)
0	100.000	2.9278	-3.2235	-1.2133	4.9764
1	717.907	2.8767	-2.9762	-1.0559	4.5819
2	944.197	2.9141	-2.9205	-1.0319	4.4848
3	88.143	2.9067	-2.8842	-1.0123	4.4222
4	42.095	2.9197	-2.8656	-1.0073	4.3936
5	37.076	2.9312	-2.8534	-1.0043	4.3750
6	24.851	2.9321	-2.8451	-1.0005	4.3619
7	18.618	2.9292	-2.8417	-0.9982	4.3564
8	17.287	2.9263	-2.8417	-0.9976	4.3563
9	13.810	2.9243	-2.8419	-0.9972	4.3565
10	10.854	2.9229	-2.8421	-0.9969	4.3567

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Dom_MS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Robust Percentiles of Residuals Section

Iter. No.	Max % Change in any Beta	Percentiles of Absolute Residuals 25th	50th	75th	100th
0	100.000	0.253	0.509	1.185	3.720
1	717.907	0.195	0.469	1.094	4.045
2	944.197	0.202	0.500	1.035	4.285
3	88.143	0.210	0.486	1.020	4.454
4	42.095	0.212	0.481	1.005	4.535
5	37.076	0.213	0.485	0.990	4.576
6	24.851	0.214	0.491	0.992	4.604
7	18.618	0.216	0.494	0.994	4.625
8	17.287	0.217	0.495	0.995	4.640
9	13.810	0.217	0.496	0.995	4.651
10	10.854	0.218	0.496	0.996	4.658

Analysis of Variance Section

Source	DF	R2	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1		1477.402	1477.402			
Model	14	0.6855	80.51563	5.751117	7.472	0.0000	1.0000
Error	48	0.3145	36.94463	0.7696797			
Total(Adjusted)	62	1.0000	117.4603	1.89452			

Analysis of Variance Detail Section

Model Term	DF	R2	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1		1477.402	1477.402			
Model	14	0.6855	80.51563	5.751117	7.472	0.0000	1.0000
Competition	1	0.0855	10.04333	10.04333	13.049	0.0007	0.9429
Cooperation	1	0.0178	2.094477	2.094477	2.721	0.1056	0.3658
Coopetition	1	0.0729	8.558973	8.558973	11.120	0.0017	0.9044
HQ	2	0.1406	16.52073	8.260363	10.732	0.0001	0.9858
Industry	4	0.0015	0.1757892	4.394731E-02	0.057	0.9937	0.0605
Rent	1	0.0220	2.581299	2.581299	3.354	0.0733	0.4344
Size_employ	1	0.0092	1.075415	1.075415	1.397	0.2430	0.2123
Size_turnover	1	0.0051	0.5952684	0.5952684	0.773	0.3835	0.1385
SubAutonomy	1	0.0003	3.623538E-02	3.623538E-02	0.047	0.8291	0.0552
Yrs_in_country	1	0.0002	2.930283E-02	2.930283E-02	0.038	0.8461	0.0542
Error	48	0.3145	36.94463	0.7696797			
Total(Adjusted)	62	1.0000	117.4603	1.89452			

PRESS Section

Parameter	From PRESS Residuals	From Regular Residuals
Sum of Squared Residuals	117.5029	36.94463
Sum of |Residuals|	61.82779	48.77848
R2	0.0000	0.6855

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Dom_MS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Robust Residuals and Weights

Row	Actual Dom_MS_Incr	Predicted Dom_MS_Incr	Residual	Absolute Percent Error	Robust Weight
1	7.000	6.932	0.068	0.970	1.0000
2	2.000	4.095	-2.095	104.743	0.4140
3	6.000	5.590	0.410	6.830	1.0000
4	6.000	6.422	-0.422	7.029	1.0000
5	5.000	5.029	-0.029	0.570	1.0000
6	3.000	2.138	0.862	28.726	1.0000
7	5.000	5.071	-0.071	1.413	1.0000
8	6.000	6.685	-0.685	11.424	1.0000
9	5.000	5.043	-0.043	0.865	1.0000
10	6.000	5.353	0.647	10.780	1.0000
11	1.000	5.659	-4.659	465.872	0.1865
12	7.000	5.124	1.876	26.793	0.4624
13	6.000	5.715	0.285	4.755	1.0000
14	7.000	6.185	0.815	11.643	1.0000
15	4.000	6.555	-2.555	63.874	0.3394
16	1.000	3.778	-2.778	277.818	0.3121
17	2.000	4.817	-2.817	140.859	0.3078
18	6.000	6.000	0.000	0.007	1.0000
19	2.000	1.718	0.282	14.109	1.0000
20	6.000	5.782	0.218	3.628	1.0000
21	6.000	5.524	0.476	7.933	1.0000
22	5.000	4.974	0.026	0.529	1.0000
23	6.000	5.524	0.476	7.941	1.0000
24	4.000	4.133	-0.133	3.333	1.0000
25	5.000	4.707	0.293	5.865	1.0000
26	4.000	4.855	-0.855	21.371	1.0000
27	4.000	5.384	-1.384	34.597	0.6265
28	7.000	6.004	0.996	14.222	0.8715
29	7.000	6.694	0.306	4.378	1.0000
30	7.000	6.658	0.342	4.886	1.0000
31	5.000	4.230	0.770	15.395	1.0000
32	2.000	3.801	-1.801	90.039	0.4815
33	6.000	5.929	0.071	1.185	1.0000
34	6.000	5.406	0.594	9.901	1.0000
35	6.000	4.974	1.026	17.103	0.8455
36	1.000	1.496	-0.496	49.648	1.0000
37	6.000	5.938	0.062	1.026	1.0000
38	3.000	3.066	-0.066	2.195	1.0000

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Dom_MS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Robust Residuals and Weights

Row	Actual Dom_MS_Incr	Predicted Dom_MS_Incr	Residual	Absolute Percent Error	Robust Weight
39	6.000	6.754	-0.754	12.564	1.0000
40	5.000	4.331	0.669	13.386	1.0000
41	5.000	4.900	0.100	1.991	1.0000
42	5.000	5.392	-0.392	7.841	1.0000
43	6.000	4.737	1.263	21.049	0.6829
44	7.000	5.999	1.001	14.305	0.8658
45	6.000	6.041	-0.041	0.682	1.0000
46	1.000	2.825	-1.825	182.516	0.4747
47	4.000	3.850	0.150	3.746	1.0000
48	6.000	5.913	0.087	1.446	1.0000
49	5.000	6.515	-1.515	30.295	0.5724
50	7.000	6.466	0.534	7.622	1.0000
51	3.000	2.544	0.456	15.192	1.0000
52	5.000	5.220	-0.220	4.400	1.0000
53	3.000	5.169	-2.169	72.291	0.3998
54	6.000	5.098	0.902	15.030	0.9549
55	5.000	5.432	-0.432	8.647	1.0000
56	5.000	5.659	-0.659	13.179	1.0000
57	6.000	5.261	0.739	12.313	1.0000
58	5.000	5.258	-0.258	5.158	1.0000
59	6.000	5.449	0.551	9.185	1.0000
60	4.000	5.317	-1.317	32.923	0.6579
61	6.000	5.715	0.285	4.750	1.0000
62	5.000	5.163	-0.163	3.262	1.0000
63	5.000	5.508	-0.508	10.167	1.0000

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Dom_MS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Predicted Values with Confidence Limits of Means

Row	Actual Dom_MS_Incr	Predicted Dom_MS_Incr	Standard Error of Predicted	95% Lower Conf. Limit of Mean	95% Upper Conf. Limit of Mean
1	7.000	6.932	0.443	6.041	7.823
2	2.000	4.095	0.302	3.487	4.703
3	6.000	5.590	0.415	4.755	6.426
4	6.000	6.422	0.355	5.707	7.136
5	5.000	5.029	0.424	4.177	5.880
6	3.000	2.138	0.497	1.140	3.137
7	5.000	5.071	0.415	4.236	5.905
8	6.000	6.685	0.399	5.884	7.487
9	5.000	5.043	0.595	3.846	6.240
10	6.000	5.353	0.259	4.833	5.874
11	1.000	5.659	0.291	5.074	6.244
12	7.000	5.124	0.368	4.384	5.865
13	6.000	5.715	0.374	4.963	6.467
14	7.000	6.185	0.300	5.582	6.788
15	4.000	6.555	0.235	6.082	7.028
16	1.000	3.778	0.197	3.383	4.174
17	2.000	4.817	0.166	4.483	5.151
18	6.000	6.000	0.384	5.228	6.773
19	2.000	1.718	0.797	0.116	3.319
20	6.000	5.782	0.297	5.186	6.379
21	6.000	5.524	0.437	4.646	6.402
22	5.000	4.974	0.562	3.844	6.103
23	6.000	5.524	0.420	4.679	6.369
24	4.000	4.133	0.457	3.214	5.053
25	5.000	4.707	0.396	3.910	5.504
26	4.000	4.855	0.545	3.759	5.951
27	4.000	5.384	0.295	4.791	5.977
28	7.000	6.004	0.403	5.195	6.814
29	7.000	6.694	0.543	5.602	7.785
30	7.000	6.658	0.631	5.389	7.927
31	5.000	4.230	0.399	3.429	5.032
32	2.000	3.801	0.288	3.221	4.381
33	6.000	5.929	0.415	5.095	6.762
34	6.000	5.406	0.314	4.774	6.038
35	6.000	4.974	0.294	4.383	5.564
36	1.000	1.496	0.700	0.090	2.903
37	6.000	5.938	0.439	5.055	6.822
38	3.000	3.066	0.507	2.046	4.086
39	6.000	6.754	0.488	5.772	7.736
40	5.000	4.331	0.505	3.314	5.347
41	5.000	4.900	0.448	4.000	5.801
42	5.000	5.392	0.359	4.669	6.115
43	6.000	4.737	0.478	3.777	5.698
44	7.000	5.999	0.424	5.147	6.850
45	6.000	6.041	0.356	5.326	6.756
46	1.000	2.825	0.385	2.050	3.600
47	4.000	3.850	0.457	2.932	4.768

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Dom_MS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Predicted Values with Confidence Limits of Means

Row	Actual Dom_MS_Incr	Predicted Dom_MS_Incr	Standard Error of Predicted	95% Lower Conf. Limit of Mean	95% Upper Conf. Limit of Mean
48	6.000	5.913	0.426	5.057	6.770
49	5.000	6.515	0.255	6.002	7.027
50	7.000	6.466	0.681	5.097	7.836
51	3.000	2.544	0.575	1.388	3.700
52	5.000	5.220	0.451	4.314	6.126
53	3.000	5.169	0.277	4.612	5.725
54	6.000	5.098	0.522	4.048	6.148
55	5.000	5.432	0.279	4.871	5.994
56	5.000	5.659	0.234	5.189	6.129
57	6.000	5.261	0.342	4.573	5.949
58	5.000	5.258	0.252	4.750	5.766
59	6.000	5.449	0.323	4.800	6.098
60	4.000	5.317	0.438	4.437	6.197
61	6.000	5.715	0.437	4.836	6.594
62	5.000	5.163	0.509	4.139	6.187
63	5.000	5.508	0.379	4.747	6.270

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Dom_MS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Residual Report

Row	Actual Dom_MS_Incr	Predicted Dom_MS_Incr	Residual	Absolute Percent Error	Sqrt(MSE) Without This Row
1	7.000	6.932	0.068	0.970	0.887
2	2.000	4.095	-2.095	104.743	0.862
3	6.000	5.590	0.410	6.830	0.884
4	6.000	6.422	-0.422	7.029	0.884
5	5.000	5.029	-0.029	0.570	0.887
6	3.000	2.138	0.862	28.726	0.873
7	5.000	5.071	-0.071	1.413	0.887
8	6.000	6.685	-0.685	11.424	0.879
9	5.000	5.043	-0.043	0.865	0.887
10	6.000	5.353	0.647	10.780	0.881
11	1.000	5.659	-4.659	465.872	0.830
12	7.000	5.124	1.876	26.793	0.863
13	6.000	5.715	0.285	4.755	0.885
14	7.000	6.185	0.815	11.643	0.878
15	4.000	6.555	-2.555	63.874	0.857
16	1.000	3.778	-2.778	277.818	0.856
17	2.000	4.817	-2.817	140.859	0.856
18	6.000	6.000	0.000	0.007	0.887
19	2.000	1.718	0.282	14.109	0.881
20	6.000	5.782	0.218	3.628	0.886
21	6.000	5.524	0.476	7.933	0.883
22	5.000	4.974	0.026	0.529	0.887
23	6.000	5.524	0.476	7.941	0.883
24	4.000	4.133	-0.133	3.333	0.886
25	5.000	4.707	0.293	5.865	0.885
26	4.000	4.855	-0.855	21.371	0.872
27	4.000	5.384	-1.384	34.597	0.870
28	7.000	6.004	0.996	14.222	0.873
29	7.000	6.694	0.306	4.378	0.885
30	7.000	6.658	0.342	4.886	0.884
31	5.000	4.230	0.770	15.395	0.878
32	2.000	3.801	-1.801	90.039	0.865
33	6.000	5.929	0.071	1.185	0.887
34	6.000	5.406	0.594	9.901	0.882
35	6.000	4.974	1.026	17.103	0.874
36	1.000	1.496	-0.496	49.648	0.878
37	6.000	5.938	0.062	1.026	0.887
38	3.000	3.066	-0.066	2.195	0.887
39	6.000	6.754	-0.754	12.564	0.877
40	5.000	4.331	0.669	13.386	0.879
41	5.000	4.900	0.100	1.991	0.886
42	5.000	5.392	-0.392	7.841	0.884
43	6.000	4.737	1.263	21.049	0.868
44	7.000	5.999	1.001	14.305	0.873
45	6.000	6.041	-0.041	0.682	0.887
46	1.000	2.825	-1.825	182.516	0.863
47	4.000	3.850	0.150	3.746	0.886

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Dom_MS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Residual Report

Row	Actual Dom_MS_Incr	Predicted Dom_MS_Incr	Residual	Absolute Percent Error	Sqrt(MSE) Without This Row
48	6.000	5.913	0.087	1.446	0.886
49	5.000	6.515	-1.515	30.295	0.869
50	7.000	6.466	0.534	7.622	0.878
51	3.000	2.544	0.456	15.192	0.882
52	5.000	5.220	-0.220	4.400	0.886
53	3.000	5.169	-2.169	72.291	0.861
54	6.000	5.098	0.902	15.030	0.872
55	5.000	5.432	-0.432	8.647	0.884
56	5.000	5.659	-0.659	13.179	0.881
57	6.000	5.261	0.739	12.313	0.879
58	5.000	5.258	-0.258	5.158	0.886
59	6.000	5.449	0.551	9.185	0.882
60	4.000	5.317	-1.317	32.923	0.868
61	6.000	5.715	0.285	4.750	0.885
62	5.000	5.163	-0.163	3.262	0.886
63	5.000	5.508	-0.508	10.167	0.883

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Dom_MS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Regression Diagnostics Section

Row	Standardized Residual	RStudent	Hat Diagonal	Cook's D	Dffits	CovRatio
1	0.0897	0.0888	0.2549	0.0002	0.0519	1.8359
2	-2.5436	-2.5903	0.1188	0.0241	-0.9509	0.6576
3	0.5303	0.5263	0.2243	0.0054	0.2830	1.6187
4	-0.5258	-0.5218	0.1641	0.0036	-0.2312	1.5045
5	-0.0371	-0.0367	0.2333	0.0000	-0.0203	1.7878
6	1.1916	1.1969	0.3204	0.0446	0.8219	1.2862
7	-0.0914	-0.0904	0.2237	0.0002	-0.0485	1.7619
8	-0.8770	-0.8749	0.2064	0.0133	-0.4462	1.3562
9	-0.0671	-0.0664	0.4606	0.0003	-0.0614	2.5390
10	0.7716	0.7683	0.0870	0.0038	0.2372	1.2456
11	-5.6286	-5.9476	0.1099	0.0486	-2.0901	0.2149
12	2.3551	2.3953	0.1760	0.0365	1.1072	0.7304
13	0.3595	0.3562	0.1818	0.0019	0.1679	1.6097
14	0.9884	0.9882	0.1168	0.0086	0.3593	1.1405
15	-3.0232	-3.0931	0.0720	0.0160	-0.8617	0.5426
16	-3.2494	-3.3317	0.0502	0.0116	-0.7663	0.4969
17	-3.2703	-3.3531	0.0359	0.0082	-0.6468	0.4900
18	-0.0005	-0.0005	0.1917	0.0000	-0.0002	1.6966
19	0.7676	0.7643	0.8244	0.1845	1.6563	6.4902
20	0.2637	0.2611	0.1144	0.0006	0.0938	1.5152
21	0.6255	0.6215	0.2476	0.0086	0.3565	1.6121
22	0.0392	0.0388	0.4102	0.0001	0.0324	2.3241
23	0.6187	0.6147	0.2295	0.0076	0.3354	1.5783
24	-0.1781	-0.1763	0.2716	0.0008	-0.1076	1.8642
25	0.3747	0.3713	0.2041	0.0024	0.1880	1.6489
26	-1.2437	-1.2510	0.3862	0.0649	-0.9923	1.3669
27	-1.6749	-1.6886	0.1130	0.0149	-0.6028	0.8836
28	1.2773	1.2831	0.2107	0.0253	0.6629	1.1067
29	0.4447	0.4409	0.3828	0.0082	0.3473	2.0886
30	0.5612	0.5572	0.5175	0.0225	0.5771	2.5751
31	0.9849	0.9846	0.2063	0.0168	0.5020	1.2721
32	-2.1734	-2.2035	0.1081	0.0184	-0.7669	0.7422
33	0.0920	0.0910	0.2233	0.0002	0.0488	1.7609
34	0.7253	0.7217	0.1283	0.0052	0.2769	1.3335
35	1.2413	1.2453	0.1120	0.0110	0.4423	1.0221
36	-0.9377	-0.9365	0.6358	0.1023	-1.2373	2.8533
37	0.0811	0.0802	0.2506	0.0001	0.0464	1.8262
38	-0.0920	-0.0910	0.3344	0.0003	-0.0645	2.0549
39	-1.0342	-1.0350	0.3097	0.0320	-0.6933	1.4168
40	0.9334	0.9321	0.3319	0.0289	0.6570	1.5596
41	0.1320	0.1306	0.2606	0.0004	0.0775	1.8446
42	-0.4899	-0.4860	0.1679	0.0032	-0.2183	1.5286
43	1.7163	1.7351	0.2965	0.0565	1.1264	1.0256
44	1.3033	1.3099	0.2331	0.0298	0.7221	1.1211
45	-0.0511	-0.0505	0.1644	0.0000	-0.0224	1.6399
46	-2.3157	-2.3547	0.1929	0.0406	-1.1511	0.7503
47	0.2000	0.1980	0.2710	0.0010	0.1207	1.8577
48	0.1131	0.1119	0.2358	0.0003	0.0622	1.7874

Robust Multiple Regression Using Huber's Method (C=1.345)

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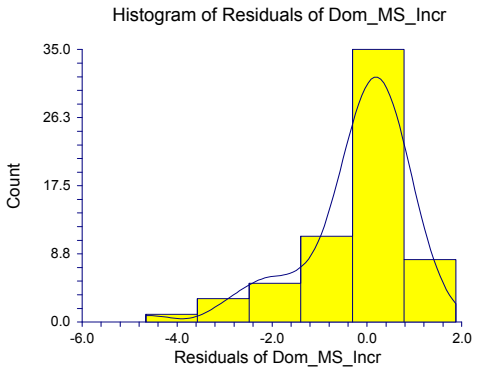
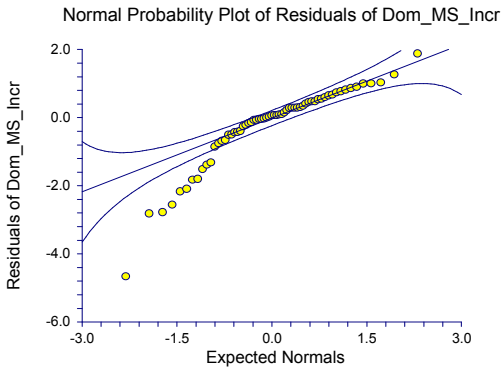
Dependent Dom_MS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

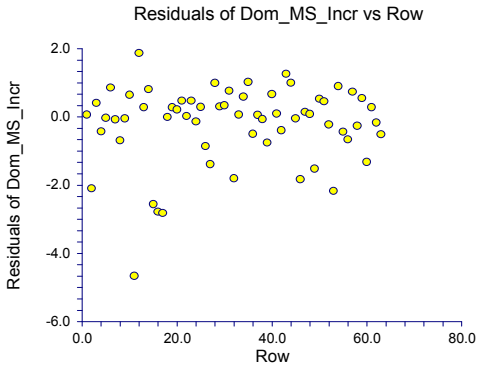
Regression Diagnostics Section

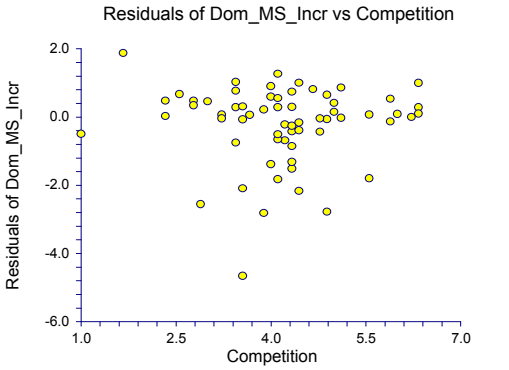
Row	Standardized Residual	RStudent	Hat Diagonal	Cook's D	Dffits	CovRatio
49	-1.8044	-1.8212	0.0844	0.0115	-0.5531	0.8269
50	0.9649	0.9642	0.6028	0.0942	1.1879	2.5737
51	0.6878	0.6840	0.4296	0.0238	0.5936	2.0722
52	-0.2923	-0.2895	0.2638	0.0020	-0.1733	1.8136
53	-2.6051	-2.6539	0.0995	0.0200	-0.8823	0.6363
54	1.2791	1.2869	0.3542	0.0571	0.9531	1.2927
55	-0.5199	-0.5159	0.1014	0.0020	-0.1733	1.4022
56	-0.7793	-0.7761	0.0710	0.0031	-0.2146	1.2196
57	0.9145	0.9129	0.1521	0.0100	0.3866	1.2425
58	-0.3070	-0.3040	0.0828	0.0006	-0.0914	1.4518
59	0.6756	0.6717	0.1355	0.0048	0.2659	1.3744
60	-1.7319	-1.7501	0.2488	0.0436	-1.0071	0.9725
61	0.3747	0.3713	0.2483	0.0031	0.2134	1.7459
62	-0.2283	-0.2260	0.3368	0.0018	-0.1610	2.0343
63	-0.6423	-0.6383	0.1862	0.0063	-0.3054	1.4805

Plots Section









Robust Multiple Regression Using Huber's Method (C=1.345)

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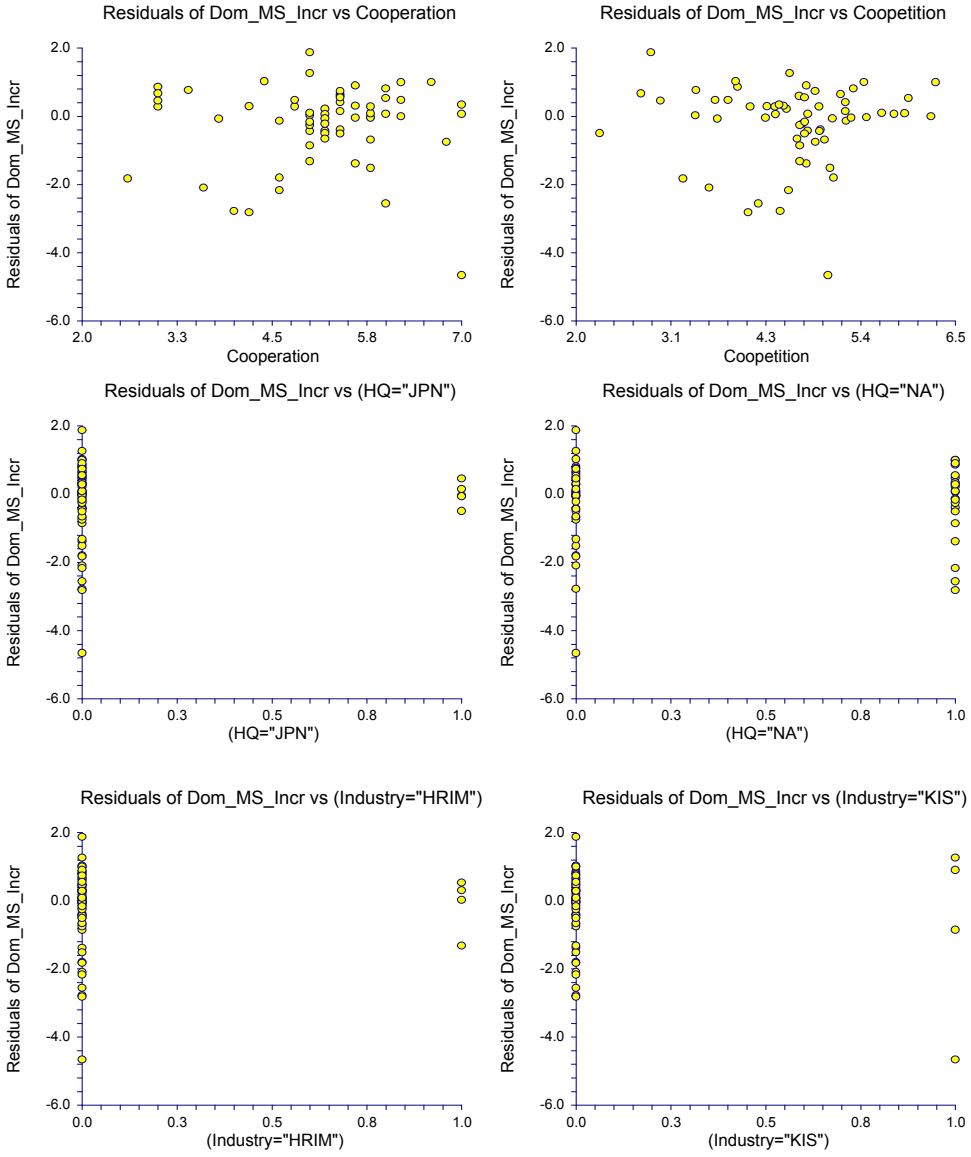

Robust Multiple Regression Using Huber's Method (C=1.345)

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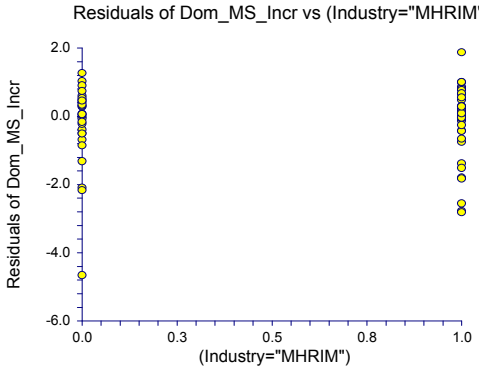

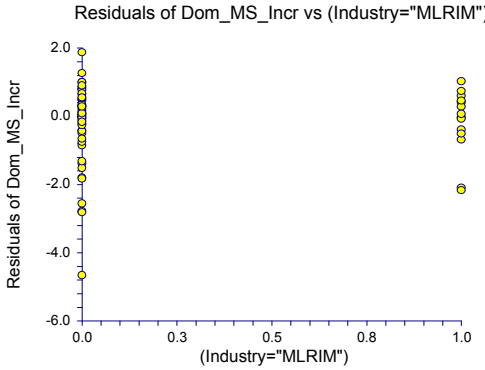

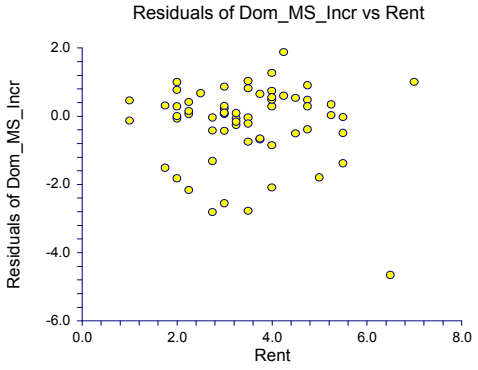

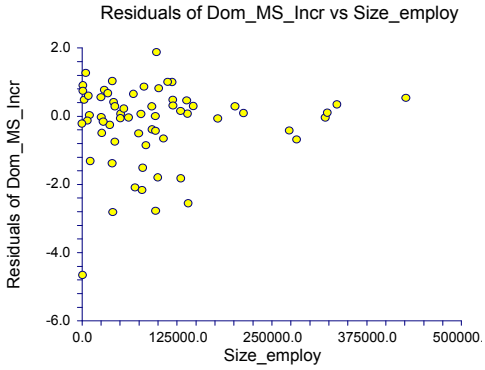

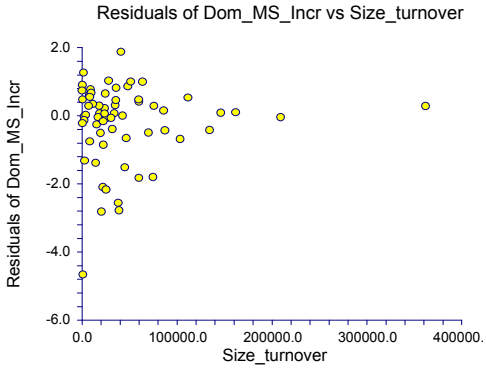

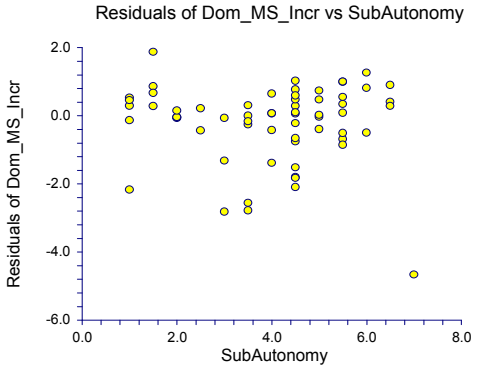

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Dom_MS_Incr
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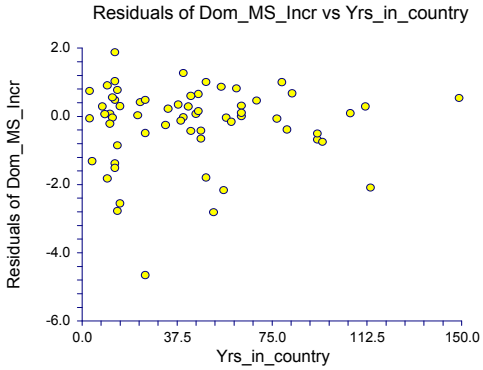

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Glob_ROS_Incr	Rows Processed	65
Number Ind. Variables	14	Rows Filtered Out	0
Weight Variable	None	Rows with X's Missing	2
R2	0.2423	Rows with Weight Missing	0
Adj R2	0.0000	Rows with Y Missing	7
Coefficient of Variation	-20.7437	Rows Used in Estimation	56
Mean Square Error	1147.579	Sum of Weights	51.557
Square Root of MSE	33.87594	Completion Status	Normal
Completion			
Ave Abs Pct Error	255.214		

Descriptive Statistics Section

Variable	Count	Mean	Standard Deviation	Minimum	Maximum
Competition	56	4.18816	1.122953	1	6.333333
Cooperation	56	5.094148	0.959075	2.6	7
Coopetition	56	4.546237	0.8145441	2.280351	6.266312
(HQ="JPN")	56	9.698017E-02	0.2865182	0	1
(HQ="NA")	56	0.2972855	0.4425257	0	1
(Industry="HRIM")	56	7.758413E-02	0.2590073	0	1
(Industry="KIS")	56	5.510008E-02	0.220918	0	1
(Industry="MHRIM")	56	0.5683233	0.4795559	0	1
(Industry="MLRIM")	56	0.2133564	0.3966469	0	1
Rent	56	3.404755	1.193931	1	7
Size_employ	56	95485.78	86137.52	21	427000
Size_turnover	56	49525.51	58710.28	341.029	362064
SubAutonomy	56	3.873471	1.466537	1	7
Yrs_in_country	56	41.71664	29.47862	3	149
Glob_ROS_Incr	56	-1.633074	33.60048	-280.46	70.78

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Regression Equation Section

Independent Variable	Regression Coefficient b(i)	Standard Error Sb(i)	T-Value to test H0:B(i)=0	Prob Level	Reject H0 at 5%?	Power of Test at 5%
Intercept	-5.3594	37.5264	-0.143	0.8871	No	0.0522
Competition	-28.8827	31.8317	-0.907	0.3695	No	0.1437
Cooperation	-29.3857	24.9676	-1.177	0.2460	No	0.2098
Coopetition	43.0639	53.2947	0.808	0.4237	No	0.1238
(HQ="JPN")	-0.6417	18.4179	-0.035	0.9724	No	0.0501
(HQ="NA")	15.9482	12.3085	1.296	0.2023	No	0.2443
(Industry="HRIM")	52.8664	26.3634	2.005	0.0516	No	0.4994
(Industry="KIS")	7.9718	27.4097	0.291	0.7726	No	0.0593
(Industry="MHRIM")	28.7790	18.7718	1.533	0.1329	No	0.3221
(Industry="MLRIM")	18.3743	20.8045	0.883	0.3823	No	0.1386
Rent	-2.2120	4.7475	-0.466	0.6437	No	0.0740
Size_employ	-0.0001	0.0000	0.000	1.0000	No	0.0500
Size_turnover	0.0002	0.0000	0.000	1.0000	No	0.0500
SubAutonomy	10.7011	4.4861	2.385	0.0218	Yes	0.6441
Yrs_in_country	0.3564	0.1901	1.875	0.0679	No	0.4488

Estimated Model

-5.35942896465473-28.8826914665101*Competition-29.3856509614232*Cooperation+ 43.0639219219664*Coopetition-.641652678776321*(HQ="JPN")+ 15.9481595920842*(HQ="NA")+ 52.8664274087435*(Industry="HRIM")+ 7.97181295385814*(Industry="KIS")+ 28.7789773175925*(Industry="MHRIM")+ 18.3742726058304*(Industry="MLRIM")- 2.2120384111483*Rent-9.38941687856658E-05*Size_employ+ 1.87572280135461E-04*Size_turnover+ 10.7011257613954*SubAutonomy+ .356424924893332*Yrs_in_country

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Regression Coefficient Section

Independent Variable	Regression Coefficient	Standard Error	Lower 95% C.L.	Upper 95% C.L.	Standardized Coefficient
Intercept	-5.3594	37.5264	-81.1455	70.4267	0.0000
Competition	-28.8827	31.8317	-93.1681	35.4028	-0.9653
Cooperation	-29.3857	24.9676	-79.8088	21.0375	-0.8388
Coopetition	43.0639	53.2947	-64.5669	150.6948	1.0440
(HQ="JPN")	-0.6417	18.4179	-37.8375	36.5541	-0.0055
(HQ="NA")	15.9482	12.3085	-8.9094	40.8058	0.2100
(Industry="HRIM")	52.8664	26.3634	-0.3756	106.1085	0.4075
(Industry="KIS")	7.9718	27.4097	-47.3832	63.3268	0.0524
(Industry="MHRIM")	28.7790	18.7718	-9.1315	66.6895	0.4107
(Industry="MLRIM")	18.3743	20.8045	-23.6413	60.3899	0.2169
Rent	-2.2120	4.7475	-11.7997	7.3756	-0.0786
Size_employ	-0.0001	0.0000			-0.2407
Size_turnover	0.0002	0.0000			0.3277
SubAutonomy	10.7011	4.4861	1.6414	19.7609	0.4671
Yrs_in_country	0.3564	0.1901	-0.0275	0.7403	0.3127

Note: The T-Value used to calculate these confidence limits was 2.020.

Robust Regression Coefficients Section

Robust Iteration	Max % Change in any Beta	Robust B(0)	Robust B(1)	Robust B(2)	Robust B(3)
0	100.000	-8.6370	-25.8143	-34.0646	33.4102
1	207.492	-5.8353	-27.9567	-30.1199	39.9190
2	114.120	-4.6048	-28.8973	-29.5807	42.8039
3	66.942	-4.9209	-28.9388	-29.5092	43.1100
4	5.175	-5.1756	-28.9305	-29.4709	43.1371
5	3.584	-5.2820	-28.9097	-29.4290	43.1100
6	1.827	-5.3268	-28.8947	-29.4045	43.0851
7	0.802	-5.3460	-28.8875	-29.3933	43.0726
8	0.334	-5.3543	-28.8845	-29.3886	43.0672
9	0.136	-5.3579	-28.8833	-29.3866	43.0650
10	0.055	-5.3595	-28.8828	-29.3858	43.0641

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Robust Percentiles of Residuals Section

Iter. No.	Max % Change in any Beta	Percentiles of Absolute Residuals 25th	50th	75th	100th
0	100.000	13.021	28.723	40.929	194.948
1	207.492	10.827	22.465	31.028	230.429
2	114.120	10.601	22.092	28.657	238.247
3	66.942	10.636	22.099	28.354	238.912
4	5.175	10.693	22.068	28.291	239.000
5	3.584	10.714	22.053	28.264	239.063
6	1.827	10.721	22.047	28.253	239.092
7	0.802	10.724	22.044	28.249	239.104
8	0.334	10.724	22.043	28.247	239.109
9	0.136	10.725	22.043	28.246	239.111
10	0.055	10.725	22.043	28.246	239.112

Analysis of Variance Section

Source	DF	R2	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1		137.4987	137.4987			
Model	14	0.2423	15043.81	1074.557	0.936	0.5302	0.4796
Error	41	0.7577	47050.75	1147.579			
Total(Adjusted)	55	1.0000	62094.56	1128.992			

Analysis of Variance Detail Section

Model Term	DF	R2	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1		137.4987	137.4987			
Model	14	0.2423	15043.81	1074.557	0.936	0.5302	0.4796
Competition	1	0.0152	944.796	944.796	0.823	0.3695	0.1437
Cooperation	1	0.0256	1589.641	1589.641	1.385	0.2460	0.2098
Coopetition	1	0.0121	749.2759	749.2759	0.653	0.4237	0.1238
HQ	2	0.0331	2057.854	1028.927	0.897	0.4158	0.1940
Industry	4	0.0894	5550.249	1387.562	1.209	0.3216	0.3444
Rent	1	0.0040	249.142	249.142	0.217	0.6437	0.0740
Size_employ	1	0.0217	1346.306	1346.306	1.173	0.2851	0.1848
Size_turnover	1	0.0325	2021.162	2021.162	1.761	0.1918	0.2540
SubAutonomy	1	0.1052	6529.999	6529.999	5.690	0.0218	0.6441
Yrs_in_country	1	0.0650	4034.326	4034.326	3.516	0.0679	0.4488
Error	41	0.7577	47050.75	1147.579			
Total(Adjusted)	55	1.0000	62094.56	1128.992			

PRESS Section

Parameter	From PRESS Residuals	From Regular Residuals
Sum of Squared Residuals	168022.1	47050.75
Sum of |Residuals|	2145.512	1620.13
R2	0.0000	0.2423

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Glob_ROS_Incr
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Normality Tests Section

Test Name	Test Value	Prob Level	Reject H0 At Alpha = 20%?
Shapiro Wilk	0.7698	0.000000	Yes
Anderson Darling	3.1554	0.000000	Yes
D'Agostino Skewness	-6.0438	0.000000	Yes
D'Agostino Kurtosis	4.8595	0.000001	Yes
D'Agostino Omnibus	60.1423	0.000000	Yes

Robust Residuals and Weights

Row	Actual Glob_ROS_Incr	Predicted Glob_ROS_Incr	Residual	Absolute Percent Error	Robust Weight
1	20.090	-3.987	24.077	119.845	1.0000
2	7.860	36.087	-28.227	359.120	1.0000
3	37.070	13.788	23.282	62.805	1.0000
4	7.220	2.915	4.305	59.628	1.0000
5	-8.840	-16.942	8.102	91.653	1.0000
6	11.870	2.614	9.256	77.975	1.0000
7		-10.610			0.0000
8	22.460	10.266	12.194	54.292	1.0000
9	-27.160	-8.810	-18.350	67.562	1.0000
10	-0.770	-6.070	5.300	688.283	1.0000
11	-139.810	-21.386	-118.424	84.703	0.3007
12	-40.460	-37.602	-2.858	7.065	1.0000
13	-24.480	-4.604	-19.876	81.192	1.0000
14	-40.830	15.630	-56.460	138.281	0.6307
15	-8.050	-10.937	2.887	35.867	1.0000
16	14.390	-11.995	26.385	183.355	1.0000
17	-52.810	22.241	-75.051	142.115	0.4745
18	-1.050	-16.621	15.571	1482.913	1.0000
19	7.710	15.518	-7.808	101.269	1.0000
20	-5.820	-0.579	-5.241	90.056	1.0000
21	6.020	-15.861	21.881	363.475	1.0000
22	2.220	29.808	-27.588	1242.689	1.0000
23	-40.210	-4.298	-35.912	89.311	0.9917
24	-19.490	-19.636	0.146	0.750	1.0000
25		-26.459			0.0000
26	-20.170	-1.778	-18.392	91.184	1.0000
27	26.880	-2.682	29.562	109.978	1.0000
28	1.460	27.507	-26.047	1784.010	1.0000
29	42.550	23.745	18.805	44.195	1.0000
30		-54.092			0.0000
31	67.540	19.040	48.500	71.809	0.7343
32	-18.120	4.682	-22.802	125.839	1.0000
33	-55.460	-41.739	-13.721	24.741	1.0000
34	-10.070	-6.334	-3.736	37.102	1.0000
35	17.270	-1.589	18.859	109.203	1.0000
36	4.930	-17.872	22.802	462.518	1.0000
37	-67.350	-32.493	-34.857	51.755	1.0000
38	1.140	-27.125	28.265	2479.364	1.0000

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Robust Residuals and Weights

Row	Actual Glob_ROS_Incr	Predicted Glob_ROS_Incr	Residual	Absolute Percent Error	Robust Weight
39	16.520	4.266	12.254	74.175	1.0000
40	32.120	19.377	12.743	39.672	1.0000
41	13.170	-0.136	13.306	101.030	1.0000
42	-2.660	22.067	-24.727	929.590	1.0000
43	20.020	1.627	18.393	91.875	1.0000
44	49.180	10.154	39.026	79.352	0.9125
45	-280.460	-41.348	-239.112	85.257	0.1489
46	-6.920	15.376	-22.296	322.198	1.0000
47	-46.100	-19.805	-26.295	57.039	1.0000
48		46.562			0.0000
49	11.130	-6.432	17.562	157.787	1.0000
50	-3.490	-8.210	4.720	135.249	1.0000
51	-12.850	-6.428	-6.422	49.976	1.0000
52	-119.710	-33.927	-85.783	71.659	0.4151
53	5.330	-16.874	22.204	416.584	1.0000
54	70.780	4.843	65.937	93.158	0.5401
55	20.010	-8.309	28.319	141.524	1.0000
56	30.820	6.258	24.562	79.696	1.0000
57		-16.878			0.0000
58	-78.000	9.199	-87.199	111.793	0.4084
59	14.410	18.305	-3.895	27.031	1.0000
60	6.860	2.797	4.063	59.223	1.0000
61		56.658			0.0000
62	16.940	-8.845	25.785	152.215	1.0000
63		33.135			0.0000

Robust Multiple Regression Using Huber's Method (C=1.345)

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NFORMATION\NCSS\LATEST_V2.S0
Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Predicted Values with Confidence Limits of Means

Row	Actual Glob_ROS_Incr	Predicted Glob_ROS_Incr	Standard Error of Predicted	95% Lower Conf. Limit of Mean	95% Upper Conf. Limit of Mean
1	20.090	-3.987	16.229	-36.762	28.788
2	7.860	36.087	18.977	-2.238	74.412
3	37.070	13.788	16.654	-19.846	47.422
4	7.220	2.915	13.876	-25.108	30.938
5	-8.840	-16.942	16.931	-51.136	17.252
6	11.870	2.614	19.017	-35.792	41.021
7		-10.610	17.736	-46.429	25.209
8	22.460	10.266	17.322	-24.716	45.248
9	-27.160	-8.810	22.923	-55.103	37.483
10	-0.770	-6.070	10.127	-26.522	14.382
11	-139.810	-21.386	13.790	-49.237	6.464
12	-40.460	-37.602	21.213	-80.443	5.239
13	-24.480	-4.604	14.131	-33.143	23.935
14	-40.830	15.630	10.034	-4.635	35.895
15	-8.050	-10.937	15.387	-42.012	20.137
16	14.390	-11.995	12.701	-37.644	13.655
17	-52.810	22.241	8.893	4.280	40.202
18	-1.050	-16.621	15.213	-47.344	14.102
19	7.710	15.518	31.998	-49.103	80.139
20	-5.820	-0.579	11.443	-23.687	22.530
21	6.020	-15.861	18.432	-53.085	21.363
22	2.220	29.808	21.167	-12.939	72.554
23	-40.210	-4.298	15.724	-36.054	27.458
24	-19.490	-19.636	17.903	-55.792	16.520
25		-26.459	17.356	-61.510	8.592
26	-20.170	-1.778	21.747	-45.697	42.141
27	26.880	-2.682	14.522	-32.010	26.646
28	1.460	27.507	18.880	-10.623	65.636
29	42.550	23.745	19.998	-16.642	64.132
30		-54.092	34.884	-124.541	16.357
31	67.540	19.040	12.622	-6.450	44.531
32	-18.120	4.682	14.579	-24.760	34.124
33	-55.460	-41.739	18.897	-79.902	-3.575
34	-10.070	-6.334	13.103	-32.796	20.128
35	17.270	-1.589	13.340	-28.530	25.351
36	4.930	-17.872	28.633	-75.699	39.954
37	-67.350	-32.493	19.068	-71.002	6.016
38	1.140	-27.125	19.937	-67.389	13.139
39	16.520	4.266	19.288	-34.687	43.220
40	32.120	19.377	20.393	-21.807	60.562
41	13.170	-0.136	17.579	-35.638	35.367
42	-2.660	22.067	15.854	-9.951	54.086
43	20.020	1.627	21.685	-42.167	45.421
44	49.180	10.154	17.537	-25.261	45.570
45	-280.460	-41.348	6.068	-53.602	-29.093
46	-6.920	15.376	19.649	-24.306	55.059
47	-46.100	-19.805	18.055	-56.268	16.658

Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Predicted Values with Confidence Limits of Means

Row	Actual Glob_ROS_Incr	Predicted Glob_ROS_Incr	Standard Error of Predicted	95% Lower Conf. Limit of Mean	95% Upper Conf. Limit of Mean
48		46.562	21.140	3.868	89.255
49	11.130	-6.432	12.820	-32.322	19.459
50	-3.490	-8.210	27.263	-63.269	46.848
51	-12.850	-6.428	22.736	-52.344	39.488
52	-119.710	-33.927	12.430	-59.030	-8.824
53	5.330	-16.874	17.265	-51.740	17.993
54	70.780	4.843	15.492	-26.443	36.129
55	20.010	-8.309	11.780	-32.100	15.482
56	30.820	6.258	9.139	-12.199	24.714
57		-16.878	14.827	-46.821	13.066
58	-78.000	9.199	6.721	-4.374	22.771
59	14.410	18.305	13.342	-8.640	45.250
60	6.860	2.797	20.308	-38.215	43.809
61		56.658	22.361	11.500	101.816
62	16.940	-8.845	20.849	-50.951	33.260
63		33.135	17.407	-2.019	68.290

Robust Multiple Regression Using Huber's Method (C=1.345)

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NFORMATION\NCSS\LATEST_V2.S0
Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Residual Report

Row	Actual Glob_ROS_Incr	Predicted Glob_ROS_Incr	Residual	Absolute Percent Error	Sqrt(MSE) Without This Row
1	20.090	-3.987	24.077	119.845	34.021
2	7.860	36.087	-28.227	359.120	33.871
3	37.070	13.788	23.282	62.805	34.035
4	7.220	2.915	4.305	59.628	34.289
5	-8.840	-16.942	8.102	91.653	34.265
6	11.870	2.614	9.256	77.975	34.251
7		-10.610			
8	22.460	10.266	12.194	54.292	34.223
9	-27.160	-8.810	-18.350	67.562	34.070
10	-0.770	-6.070	5.300	688.283	34.286
11	-139.810	-21.386	-118.424	84.703	32.402
12	-40.460	-37.602	-2.858	7.065	34.292
13	-24.480	-4.604	-19.876	81.192	34.122
14	-40.830	15.630	-56.460	138.281	33.484
15	-8.050	-10.937	2.887	35.867	34.293
16	14.390	-11.995	26.385	183.355	34.000
17	-52.810	22.241	-75.051	142.115	33.234
18	-1.050	-16.621	15.571	1482.913	34.186
19	7.710	15.518	-7.808	101.269	34.090
20	-5.820	-0.579	-5.241	90.056	34.285
21	6.020	-15.861	21.881	363.475	34.048
22	2.220	29.808	-27.588	1242.689	33.839
23	-40.210	-4.298	-35.912	89.311	33.697
24	-19.490	-19.636	0.146	0.750	34.297
25		-26.459			
26	-20.170	-1.778	-18.392	91.184	34.086
27	26.880	-2.682	29.562	109.978	33.904
28	1.460	27.507	-26.047	1784.010	33.936
29	42.550	23.745	18.805	44.195	34.098
30		-54.092			
31	67.540	19.040	48.500	71.809	33.558
32	-18.120	4.682	-22.802	125.839	34.063
33	-55.460	-41.739	-13.721	24.741	34.197
34	-10.070	-6.334	-3.736	37.102	34.291
35	17.270	-1.589	18.859	109.203	34.143
36	4.930	-17.872	22.802	462.518	33.627
37	-67.350	-32.493	-34.857	51.755	33.642
38	1.140	-27.125	28.265	2479.364	33.848
39	16.520	4.266	12.254	74.175	34.216
40	32.120	19.377	12.743	39.672	34.204
41	13.170	-0.136	13.306	101.030	34.208
42	-2.660	22.067	-24.727	929.590	34.010
43	20.020	1.627	18.393	91.875	34.087
44	49.180	10.154	39.026	79.352	33.598
45	-280.460	-41.348	-239.112	85.257	30.925
46	-6.920	15.376	-22.296	322.198	34.023
47	-46.100	-19.805	-26.295	57.039	33.943

Robust Multiple Regression Using Huber's Method (C=1.345)

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Database D:\FRANCOIS BACKUP\MY DOCUME ...
NFORMATION\NCSS\LATEST_V2.S0
Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Residual Report

Row	Actual Glob_ROS_Incr	Predicted Glob_ROS_Incr	Residual	Absolute Percent Error	Sqrt(MSE) Without This Row
48		46.562			
49	11.130	-6.432	17.562	157.787	34.165
50	-3.490	-8.210	4.720	135.249	34.274
51	-12.850	-6.428	-6.422	49.976	34.269
52	-119.710	-33.927	-85.783	71.659	32.985
53	5.330	-16.874	22.204	416.584	34.053
54	70.780	4.843	65.937	93.158	33.197
55	20.010	-8.309	28.319	141.524	33.963
56	30.820	6.258	24.562	79.696	34.059
57		-16.878			
58	-78.000	9.199	-87.199	111.793	33.098
59	14.410	18.305	-3.895	27.031	34.290
60	6.860	2.797	4.063	59.223	34.287
61		56.658			
62	16.940	-8.845	25.785	152.215	33.904
63		33.135			

Robust Multiple Regression Using Huber's Method (C=1.345)

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NFORMATION\NCSS\LATEST_V2.S0
Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Regression Diagnostics Section

Row	Standardized Residual	RStudent	Hat Diagonal	Cook's D	Dffits	CovRatio
1	0.8097	0.8062	0.2295	0.0130	0.4400	1.4760
2	-1.0059	-1.0060	0.3138	0.0309	-0.6804	1.4509
3	0.7892	0.7855	0.2417	0.0132	0.4435	1.5181
4	0.1393	0.1376	0.1678	0.0003	0.0618	1.7280
5	0.2761	0.2730	0.2498	0.0017	0.1575	1.8774
6	0.3302	0.3265	0.3151	0.0033	0.2215	2.0320
7			0.2741			
8	0.4189	0.4146	0.2615	0.0041	0.2467	1.8389
9	-0.7357	-0.7315	0.4579	0.0305	-0.6723	2.1887
10	0.1639	0.1620	0.0894	0.0002	0.0507	1.5749
11	-3.8273	-4.0014	0.1657	0.0583	-1.7834	0.3156
12	-0.1082	-0.1069	0.3921	0.0005	-0.0859	2.3724
13	-0.6456	-0.6409	0.1740	0.0059	-0.2942	1.5043
14	-1.7450	-1.7654	0.0877	0.0123	-0.5475	0.7730
15	0.0957	0.0945	0.2063	0.0002	0.0482	1.8187
16	0.8401	0.8371	0.1406	0.0077	0.3385	1.2987
17	-2.2960	-2.3403	0.0689	0.0123	-0.6367	0.6051
18	0.5144	0.5098	0.2017	0.0045	0.2562	1.6462
19	-0.7020	-0.6976	0.8922	0.2719	-2.0068	11.2062
20	-0.1644	-0.1624	0.1141	0.0002	-0.0583	1.6187
21	0.7699	0.7660	0.2960	0.0166	0.4967	1.6537
22	-1.0430	-1.0442	0.3904	0.0465	-0.8356	1.5872
23	-1.1968	-1.2032	0.2155	0.0260	-0.6305	1.0878
24	0.0051	0.0050	0.2793	0.0000	0.0031	2.0095
25			0.2625			
26	-0.7081	-0.7037	0.4121	0.0234	-0.5892	2.0484
27	0.9659	0.9651	0.1838	0.0140	0.4579	1.2563
28	-0.9260	-0.9244	0.3106	0.0258	-0.6205	1.5300
29	0.6877	0.6832	0.3485	0.0169	0.4997	1.8679
30			1.0604			
31	1.5428	1.5574	0.1388	0.0188	0.6253	0.8750
32	-0.7457	-0.7416	0.1852	0.0084	-0.3536	1.4483
33	-0.4880	-0.4835	0.3112	0.0072	-0.3249	1.9266
34	-0.1196	-0.1182	0.1496	0.0002	-0.0496	1.6942
35	0.6057	0.6009	0.1551	0.0045	0.2574	1.4979
36	1.2596	1.2689	0.7144	0.2646	2.0071	2.8058
37	-1.2449	-1.2535	0.3168	0.0479	-0.8537	1.1894
38	1.0320	1.0329	0.3464	0.0376	0.7519	1.4930
39	0.4400	0.4356	0.3242	0.0062	0.3017	1.9962
40	0.4711	0.4666	0.3624	0.0084	0.3517	2.0939
41	0.4595	0.4550	0.2693	0.0052	0.2762	1.8343
42	-0.8260	-0.8227	0.2190	0.0128	-0.4357	1.4418
43	0.7067	0.7024	0.4098	0.0231	0.5852	2.0417
44	1.3465	1.3576	0.2680	0.0404	0.8214	1.0667
45	-7.1745	-7.8592	0.0321	0.0169	-1.4309	0.0671
46	-0.8080	-0.8045	0.3364	0.0221	-0.5728	1.7156
47	-0.9174	-0.9156	0.2841	0.0223	-0.5767	1.4821
48			0.3894			

Robust Multiple Regression Using Huber's Method (C=1.345)
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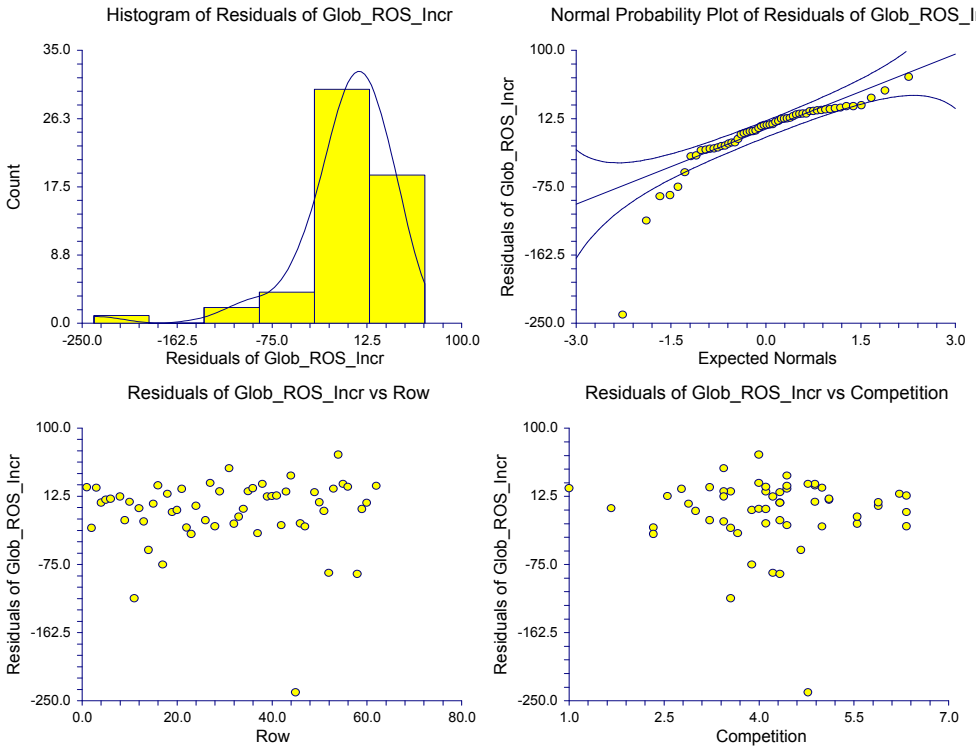
DependentGlob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.

Regression Diagnostics Section

Row	Standardized Residual	RStudent	Hat Diagonal	Cook's D	Dffits	CovRatio
49	0.5601	0.5553	0.1432	0.0035	0.2270	1.5065
50	0.2347	0.2320	0.6477	0.0068	0.3146	4.0286
51	-0.2557	-0.2528	0.4504	0.0036	-0.2289	2.5731
52	-2.7221	-2.7957	0.1346	0.0319	-1.1027	0.5195
53	0.7618	0.7578	0.2597	0.0136	0.4489	1.5798
54	2.1887	2.2335	0.2091	0.0456	1.1485	0.6889
55	0.8916	0.8893	0.1209	0.0073	0.3298	1.2282
56	0.7530	0.7489	0.0728	0.0030	0.2098	1.2675
57			0.1916			
58	-2.6263	-2.6880	0.0394	0.0077	-0.5441	0.5183
59	-0.1251	-0.1236	0.1551	0.0002	-0.0530	1.7044
60	0.1498	0.1480	0.3594	0.0008	0.1109	2.2422
61			0.4357			
62	0.9657	0.9649	0.3788	0.0379	0.7535	1.6509
63			0.2640			

Plots Section



Robust Multiple Regression Using Huber's Method (C=1.345)

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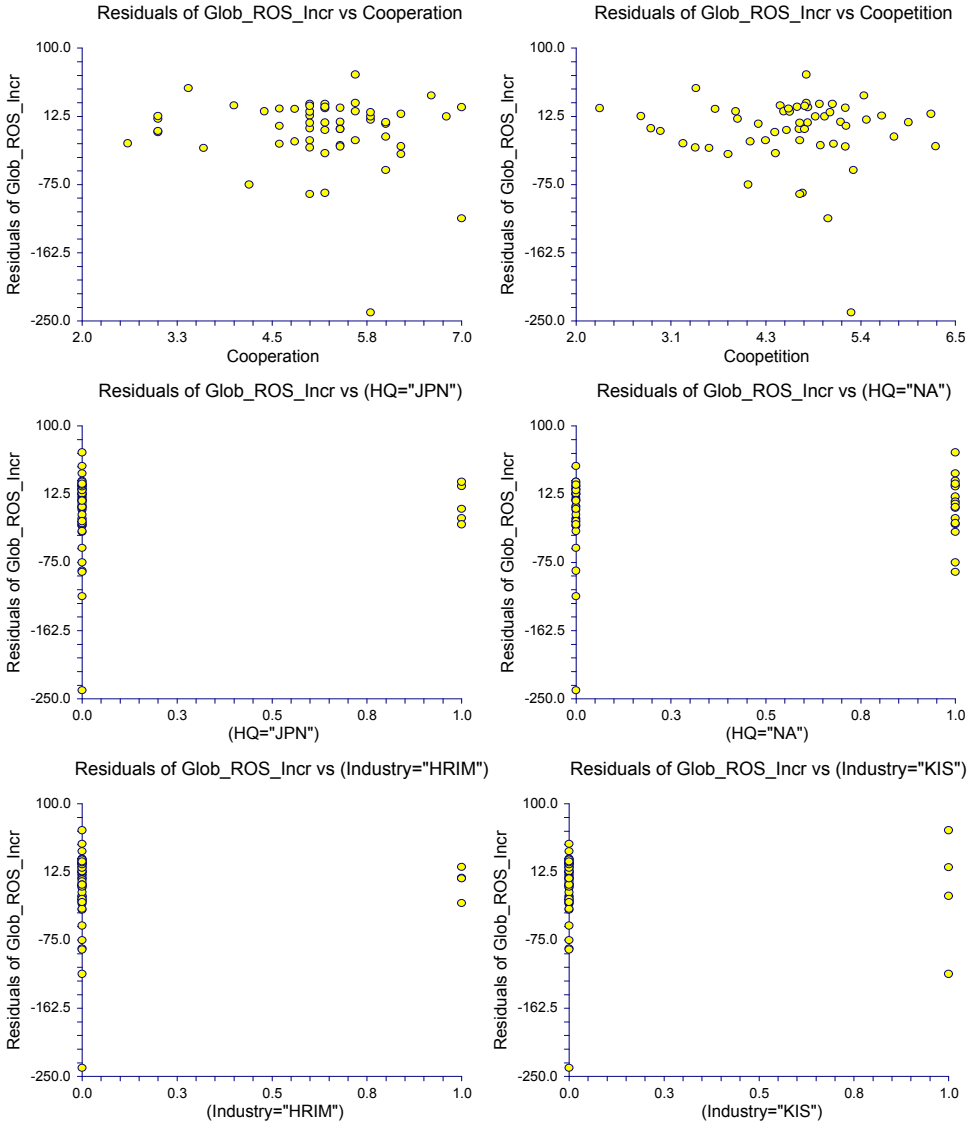
NFORMATION\NCSS\LATEST_V2.S0
Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.



Robust Multiple Regression Using Huber's Method (C=1.345)

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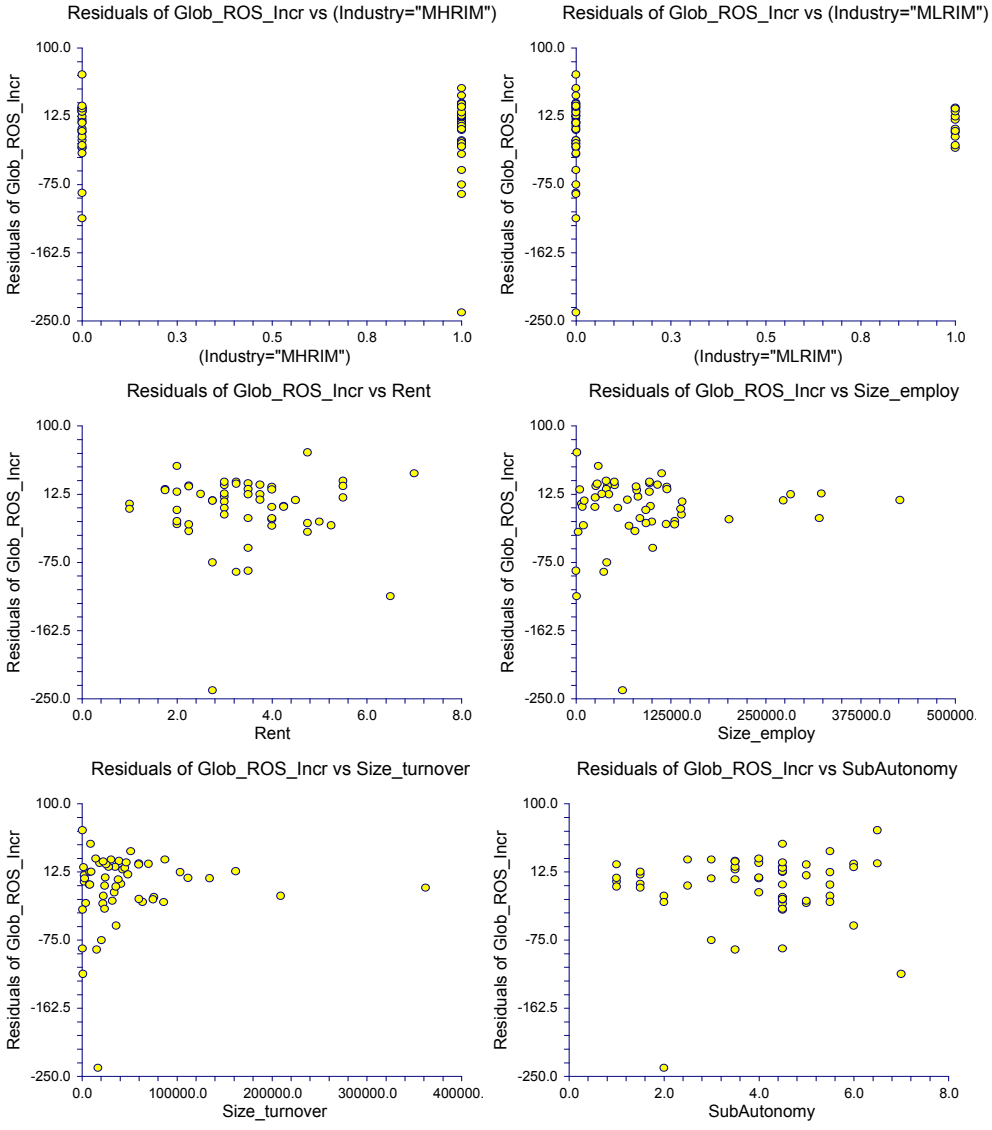
NFORMATION\NCSS\LATEST_V2.S0
Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.



Robust Multiple Regression Using Huber's Method (C=1.345)

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Dependent Glob_ROS_Incr
Warning: At least one value was reset to 0.0 because it was less than the machine zero of 0.0000000001.