T.P. de Koning

Asymmetric Joint Ventures

The effect of opportunism and trust on the performance of asymmetric joint ventures.

August 8th 2017

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Asymmetric Joint Ventures

THE EFFECT OF OPPORTUNISM AND TRUST ON THE PERFORMANCE OF ASYMMETRIC JOINT VENTURES.

Master thesis submitted to Delft University of Technology

in partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE

in **Management of Technology**

Faculty of Technology, Policy and Management

by

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To be defended in public on August 28th 2017

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Worldwide, organisations are establishing joint ventures to overcome market trends and size-specific challenges. Smaller sized organisations lack financial resources to introduce their innovation to the market, while larger sized organisations trouble with renewing their core business models. Consequently, more and more joint ventures are established between dissimilar sized organisations to combine resources and knowledge. However, these asymmetric joint ventures are subject to specific opportunistic behaviour which is promoted by a power imbalance between the partners.

Opportunistic behaviour may harm the performance of a joint venture and may even jeopardise the survivability of an organisation. In an asymmetric joint venture it is likely that the larger sized organisation will accumulate the majority of bargaining power by which the smaller sized organisation is put at risk. Therefore this research is conducted to assess how opportunistic behaviour emerges through a power imbalance. And eventually how this affects the overall performance of an asymmetric joint venture. Next, it is expected that when opportunistic behaviour emerges, that it will decrease cooperative behaviour and thus will affect the trust between the partners.

Data was retrieved by combining the SDC Platinum alliance database with the Orbis financial database to identify asymmetric joint ventures which have been established worldwide in the last ten years. From these asymmetric joint ventures, only the joint ventures operating in the manufacturing division were contacted, because these are characterised by product innovations to stay competitive. By doing several internet searches per asymmetric joint venture, contact information could be retrieved of executives knowledgeable of these joint ventures. A cross-sectional survey design was used to collect data about the asymmetric joint ventures. In total 77 completed surveys were collected.

The results of this research show that the amount of financial resources and expertise brought to the joint venture will determine the bargaining power of each partner. The majority of bargaining power is in most cases accumulated by the larger partner and is based on the financial investments made to the joint venture. The powerful party may use its bargaining power to alter the strategic direction of the joint venture in her favour, as bargaining power was found to be negatively correlated with goal congruence. Next, the relationship between goal congruence and joint venture performance was found to be fully mediated by trust. This suggests that opportunistic behaviour needs time to get recognised by the disadvantaged partner since it is disguised.

Despite the fact that roughly 70% of the joint ventures worldwide were found to be asymmetric and achieve less performance than symmetric alliances, the current literature is barely addressing the characteristics that influence the performance of asymmetric joint ventures. This research, however, addressed some of these characteristics by examining the relationship between power imbalance and opportunistic behaviour in asymmetric joint ventures.

The practical relevance of this study is that the bargaining power of the larger partner may be limited by the smaller partner by significantly contributing in expertise to the joint venture. Next, smaller partners should be aware of different sized absorptive capacities, through which the larger partner may outlearn them and identify private opportunities that may promote opportunistic behaviour. Lastly, this research showed that trust is a critical factor in achieving high performance in asymmetric joint ventures. However, building a relationship in an asymmetric setting might be a challenging task due to the unfamiliarity between the dissimilar sized organisations.

Dear reader,

The topic of technological collaborations raised my attention as soon as I learned that the success of these collaborations do not solely depend on the success of their innovations, but do depend on a strategic game played by both organisations. This game relates to each organisation trying to maximise its profits gained throughout the collaboration by framing each other, that in some cases is done at the expense of the other organisation. Within this thesis I combined my interest with joint ventures between large and small organisations, as I expected that the former would be way more better at playing this game than the latter. Before the actual work is described, I would like to thank some important persons to me.

Foremost, I would like to express my gratitude to my first supervisor Dr. Ing. Victor Scholten for accepting to be my supervisor in the first place. Also I would like to thank him for his continuous support of my master thesis, suggestions, enthusiasm, and expertise. Without his guidance I would not have been able to design and complete this thesis project.

Besides my first supervisor, I would like to thank the rest of my graduation committee: Prof. Dr. Cees van Beers and Dr. Gerdien de Vries for their time, insightful comments, and critical questions. Also I would like to thank all the professors and fellow students of my faculty who helped me to design a research proposal and write this thesis during the last year.

Last but not the least, I would like to thank my close family and friends for supporting and motivating me throughout the course of writing this thesis. Without them, working at home or at the university would have been an even more challenging task.

Thom

Delft, August 8th 2017

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1 INTRODUCTION

1.1 SUMMARY

Alliances between organisations are made to overcome market trends by combining resources and proprietary knowledge to innovate. This research focuses on asymmetric joint ventures, which are separate entities established by the allying organisations. These organisations differ in organisational size, by which it is expected that they endow different amount of investments to the joint venture and therefore a power imbalance emerges between the partners. Due to the power imbalance, opportunistic behaviour is promoted which can be detrimental to the success of a joint venture. Despite this major disadvantage for asymmetric joint ventures, the current literature mainly focussed on the advantages to be gained in symmetric joint ventures. Therefore, this research will review the effect of opportunism in asymmetric joint ventures, to make executives more aware of the differences between symmetric and asymmetric joint ventures. Furthermore, opportunistic behaviour is expected to negatively influence trust among the partners, which eventually reduces cooperative behaviour. The results are not only of scientific importance, but also has a practical relevance. Executives of asymmetric joint ventures are enabled to better understand what consequences a power imbalance could give on the performance of joint ventures.

1.2 INTRODUCTION

It is becoming more challenging for new organisations to enter a market due to the rising research and development expenditures, rising complexity of solutions, globalisation of business, and size-increasing incumbents (Kilubi & Haasis, 2016; Teece, 1986). Particularly, entrepreneurial firms and smaller sized organisations are too small to overcome the above mentioned trends and have insufficient resources to fully research, develop, and commercialise an innovation to the market. Therefore, it is necessary for these organisations to pursue alliances with other organisations to combine resources and knowledge in order to compete. This enables them to be competitive advantaged over its competition by having access to new knowledge and assets which could be implemented into riskier projects. These kind of alliances are not only beneficial for smaller sized firms, since larger organisations do also collaborate with smaller sized organisations to gain access to proprietary knowledge to use within their core market (Geringer & Hebert, 1990). Large organisations do have the finance to research, develop, and commercialise innovations, but are too rigid to recognise opportunities across their established market (Beamish & Jung, 2005). Allying up with the smaller organisations gives them the opportunity to adjust to radical technological change by renewing their core business models (Rothaermel, 2001). Which is required, as a technological discontinuity may jeopardise the survivability of the existing rigid organisations (Schilling, 2013). Consequently, allying is beneficial for both small and large organisations, as they may overcome their size-specific challenges. However, alliances between smaller and larger sized organisations will introduce new challenges due opportunistic behaviour (Lee, Park, Yoon, & Park, 2010).
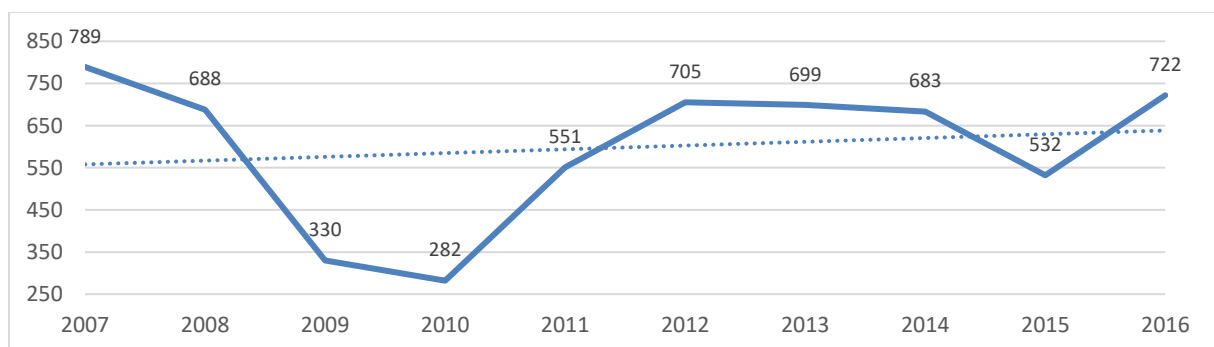

Figure 1 – Completed JV deals worldwide in the period of 01-2007 until 12-2016 (Thomson Reuters, 2017)**.**

This research will focus on "joint ventures (JVs)" which is the most extreme form of equity-based alliances, in which a separate entity is made to jointly conduct business on a daily basis (Gulati & Singh, 1998). JVs are popular for costs and risk reduction, increased operation efficiency, creation of entry barriers, and access to proprietary knowledge, markets, and capital (Bell, 1994; Bell & Jagersma, 1992). According to the alliance database *SDC Platinum*, 5981 JV deals were signed between two organisations worldwide in the period of January 2007 until December 2016 (Thomson Reuters, 2017). Figure 1 shows that JVs are established with an increasing trend over the last 10 years, this trend is influenced by the economic crisis in 2008 that most probably have affected the drop of JV deals in 2009 and 2010. *Please note that the most popular alliance databases (e.g. SDC Platinum and MERIT-CATI) do not represent the actual amount of JVs established worldwide, but represent a sample (Schilling, 2009).*

Despite the advantages of JVs to overcome market barriers, not all organisations engage in alliances due the uncertainties on how the relationship might develop overtime (Kilubi & Haasis, 2016). These uncertainties relate to the extra costs involved with JVs: (1) transaction costs, which relate to the costs required to manage the relationship and to establish the JV, and (2) opportunistic behaviour, which relates to the unfair appropriation of profits and leakage of proprietary information (Beers & Zand, 2014). This behaviour can be detrimental to an JV's performance, since it negatively affects the cooperative behaviour between the organisations.

1.3   PROBLEM BACKGROUND

The previous part introduced opportunistic behaviour which can be detrimental to the success of JVs, because profits are unfairly appropriated between the organisations and or due leakage of proprietary information. Nyaga, Lynch, Marshall and Ambrose (2013) argue that opportunistic behaviour is affected by the degree of bargaining power each partner has in the JV. This power is based on the investments made to the JV in respective to the other partners, the more vast the investment, the bigger the accumulated power within the JV will be. In JVs owned by similar sized organisations it is likely that both organisations will invest the same amount of resources in the JV and will therefore have a somewhat equal power balance, since they have more or less the same resource pool. However, in JVs owned by dissimilar sized organisations, it is likely that the larger sized organisation invests more, through which it accumulates more power than the smaller sized partner. This may result in more opportunistic behaviour through a power imbalance in bargaining power (Kilubi & Haasis, 2016). These type of JVs are called asymmetric JVs in which the resource endowments by each partner in the JV differ (Pérez, Florin, & Whitelock, 2012).

A power imbalance between the partners in asymmetric JVs does not immediately suggest opportunistic behaviour, but could incentivise a partner to act opportunistic. Because it is likely that the larger organisation in the asymmetric JV invest the most and thus accumulated the most power it is able to steer the strategic direction of the JV. This steering can be done in favour of the JV itself, but also to the larger partner's private objectives on the expense of the smaller partner (Alvarez & Barney, 2005). If this kind of opportunistic behaviour appears, then the smaller partner will be less incentivised to invest in the JV, by which cooperative behaviour is limited and the JV's survivability is put at risk.

This research will therefore look into the effect of opportunistic behaviour resulting from asymmetric JVs on the performance of JVs. This is done because symmetric and asymmetric JVs are expected to have a different influence on the probability for opportunistic behaviour to occur in JVs. While in symmetric JVs there are similar sized partners which have an equal power balance if they invested equally, there is a power imbalance in asymmetric JVs because the smaller partner has insufficient resources to match the investments made by the larger partner. Next to opportunistic behaviour, trust will also be studied within this research, since trust is expected to be influenced by opportunistic behaviour which negatively affects the performance of the JV (Gulati & Singh, 1998; Kale, Singh, & Perlmutter, 2000).

1.4 LITERATURE GAP

This section will focus on the literature gap this research is addressing, a thorough literature review will be conducted in the next chapter: *chapter 2 - Theoretical Background*. Pérez et al., (2012) gives notion to the differences between symmetric and asymmetric alliances, since asymmetric alliances are getting more and more prevalent to overcome the market trends in recent years. According to Hottenrot & Lopes-Bento (2016) current literature did mainly focus on the advantages gained for alliances who conduct R&D activities, but did less focus on the drawbacks of these alliances. A drawback of allying is that partners may act opportunistic which cannot be controlled by either organisation, and thus relies on the trust *(benevolence and integrity)* between the organisations. Pérez et al., (2012) did not include opportunistic behaviour which is expected to influence the performance of alliances in their study to describe characteristics of asymmetric alliances. As discussed above in the problem background, one could expect more opportunistic behaviour in asymmetric JVs than within symmetric JVs due to power imbalances (Nyaga et al., 2013). Hence, this research will look into the effect of opportunistic behaviour in asymmetric JVs.

1.5 RESEARCH QUESTIONS

The objective of this research is to further develop the notion of asymmetric JVs, by dealing with the effect of a power imbalance on opportunistic behaviour. Trust is also included within the research since it is expected to be positively related with the performance of an JV. This is done by reviewing asymmetric JVs in the manufacturing sector which are established in the period of January 2007 until December 2016 (10 years) to assess the effect of opportunism and trust on JV performance. The following research question is set:

> "*How does opportunism and trust between asymmetric sized partners affect the JV performance?*"

To answer the research question the following central questions are developed:

1. *"What is the relationship between power imbalance, opportunistic behaviour, trust, and JV performance?".*

    By understanding the relationship among the mentioned variables, a conceptual model can be made to assess how opportunistic behaviour and trust affect JV performance. To answer this question, descriptive knowledge is needed about each concept that will be deduced from the literature. This central question will be discussed in the literature review in Chapter 2.

2. *"How can the relationship between power imbalance, opportunistic behaviour, trust, and JV performance be observed within asymmetric JVs established in the last ten years?"*

    The answer to this central question is critical to obtain data required to achieve the research objective. To answer this central question, several sub-questions are needed with respect to gain access to data about JVs worldwide, contact data, and data to measure the variables. This central question will be discussed in the methodology chapter (chapter 3).
    a. Which databases are used to determine the JVs established in the last 10 years and how are these JVs filtered?
    b. Which method is used to determine the contact details of the involved JV partners and how will they be contacted?
    c. What factors influencing the variables mentioned in the first central question should be measured via a survey?

3. *"How do the variables power imbalance, opportunistic behaviour, and trust relate to each other?"*

The previous central questions provided the framework to test the relationships among the variables. Now, the third central question will test these relationships. This central question will be discussed in the results chapter (chapter 4).

    a.   What statistical relationships can be retrieved from the data following from central question 2?

    b.   What is the effect of more asymmetry on the other variables?

The answer to the research question will be given in the discussion chapter (chapter 5).

1.6 RESEARCH RELEVANCE

1.6.1 SCIENTIFIC RELEVANCE

The existing literature does clearly describe the effects for similar sized organisations which collaborate to enhance their innovation output (Hottenrot & Lopes-Bento, 2016). However, sufficient literature reviewing the effects of collaborative innovation in asymmetric collaborations is lacking (Pérez et al., 2012). The problem background suggested that the performance of asymmetric JVs may be subject to specific opportunistic behaviour due firm sizes. Therefore, this research will contribute to the existing strategic alliance theory by supporting the concept of asymmetric alliances which is done by specifically focussing on JVs. This is combined by considering that trust between the organisations is influenced by opportunistic behaviour and may positively affect JV performance. It is important to make a distinction between asymmetric JVs and symmetric JVs, in order to develop two separate literature streams: symmetric and asymmetric alliances. These two separate streams are required to better understand the mechanisms used within such alliances.

1.6.2 PRACTICAL RELEVANCE

The findings of this research will make JV executives more aware of the performance of asymmetric JVs. This performance is negatively influenced by the opportunistic behaviour which is strengthened by power imbalance between the smaller and larger organisations. It is important to understand this relationship, since more JVs are established between small and large organisations to overcome their size-specific challenges and to overcome market trends (Kilubi & Haasis, 2016). This study, helps JV executives to better understand their partners' (opportunistic) behaviour in asymmetric JVs and its (potential) effect on the performance of the JV. Through the enhanced understanding, the executives could be more effective at enacting upon each other's behaviour, by which performance loss can be prevented and cooperative behaviour promoted. An example why this is important is that the success of asymmetric JV may be indispensable for the smaller sized organisation. This is argued because the resource endowments of the small organisation may be a large proportion of its total resources, and thus a failing JV could jeopardise the survival of this organisation.

1.7 THESIS OUTLINE

The thesis uses the following structure to present the research: 1. introduction, 2. literature review, 3. methodology, 4. results, and 5. discussion. First off, chapter 1, introduced the problem at hand and provided the research objective to assess the relationship of opportunistic behaviour and trust in asymmetric JVs. Also the theoretical and practical relevance of the research objective's results are discussed.

Chapter 2, the literature review, will be conducted to review what is already known relative to the research objective at hand. This chapter will start by discussing different types of alliances and which rents can be gained from it. Next, the factors influencing these rents will be examined, which are the following: power imbalance, opportunistic behaviour, and trust. At the end of every theory section hypotheses are developed which are close to the research objective. At the end, the hypotheses are summarised in a conceptual model.

Chapter 3, the methodology chapter, will start off by discussing on how the research is designed to obtain the required data to validate the hypotheses. Next, the variables are operationalised in order to measure them in a questionnaire. Thirdly, the method of retrieving the required data is examined. Next, the survey design, required sample size, and survey response will be discussed. The last subsection will explain in which manner the data is prepared to conduct statistical analyses with it.

Chapter 4, the results chapter, will analyse the data with SPSS in order to validate the hypotheses developed in the literature section. The analyses include univariate, bivariate, and multivariate analyses to study the relationships among the variables.

Finally, the results will be discussed in the discussion chapter, chapter 5. This chapter will address the research objective by discussing the results of the research. Next, the limitations found to effect this research are discussed together with potential future research. Finally, the thesis is concluded in a conclusion.

1.8   CONCLUSION

This chapter introduced the research at hand, due power imbalances in asymmetric JVs opportunistic behaviour may be promoted which is detrimental to the success of JVs. This major disadvantage of asymmetric JVs is not reviewed that well in current literature and will therefore be reviewed within this research. The objective of this research is to review the effect of power imbalances on opportunistic behaviour and how this affects trust and JV performance. To achieve this research objective, a theoretical background is needed to understand the relationships among power imbalance, opportunistic behaviour, trust, and JV performance which will be done in the next chapter.

2.1 SUMMARY

This chapter conducted a literature review to learn what is already known around the research objective. Articles included in the literature review belong to the best in field and or were recently published. To retrieve these articles several literature databases were used and were filtered on keywords. The literature review shows that the performance of joint ventures is determined by (1) the relative amount of opportunistic behaviour emergent in a joint venture, (2) the degree of trust among the partners, (3) relative scale and absorptive capacity, and (4) the relative bargaining power each partner has. The theorised conceptual model suggests that the degree of power positively affects the degree of opportunistic behaviour which in turn negatively affects the degree of trust among the partners.

2.2 INTRODUCTION

To assess what is already known relative to the research objective, a theoretical background of each concept in the research objective is conducted. With this background a conceptual model can be developed to visualise the relationships among the concepts. And thus the first central question will be answered: *"What is the relationship between power imbalance, opportunistic behaviour, trust, and JV performance?".* The literature review will follow a funnel approach by first discussing the reasons for organisations to establish alliances and which main structures of alliances exist. Then, the specific rents belonging to alliances will be discussed. These rents are determined by factors which are: opportunistic behaviour, power, and trust. Each part will focus on developing hypotheses close to the research objective at hand with regard to performance in asymmetric JVs.

2.3 METHODOLOGICAL INTRODUCTION

Before diving into the literature, the method of retrieving the theory is discussed. To write the literature review, articles were mainly retrieved from the online databases named Wiley Online Library[1] and Scopus[2]. The online databases were filtered on the following high quality journals based on the Journal List of the Erasmus Research Institute of Management. Journals listed as *"P"* or *"STAR"* indicate that the journals belong to the best journals in the field of management (ERIM, 2016)**.** Examples of STAR and P journals are: *Organisation Science, Research Policy, Strategic Management Journal, Academy of Management (Review), Administrative Science Quarterly, Journal of Product Innovation Management,* and *Strategic Entrepreneurship Journal*. Journals not listed above were only selected when the article was close to the research objective at hand or was recently published (after 2014). Two institutional accounts were used to gain access to the best journals, namely from: Delft University of Technology and Erasmus University Rotterdam.

The articles relate to theory surrounding the following subjects as mentioned in the introduction; alliances (JVs), opportunistic behaviour, power, trust, and alliance performance. For the first subject, JVs, the following keywords were used: alliance, collaboration, joint venture, research collaboration, collaborative R&D, cooperation, coopetition, knowledge creation, mergers and acquisitions, strategic alliances, strategic entrepreneurship, and technological collaboration. For the second subject, opportunistic behaviour, a combination of the previously mentioned keywords and opportunistic behaviour were used. This was also done again for the third, fourth, and fifth subject, by combining the keywords used for JVs and the subject at hand. Not only searching through the databases was used to retrieve articles based on keywords, but were also found

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[1] http://onlinelibrary.wiley.com

[2] https://www.scopus.com

by backward and forward citing from articles which were close to the thesis' subject and were retrieved through recommendations by the graduation committee.

2.4   ALLIANCES

2.4.1   ALLIANCES

An alliance is an agreement between two or more organisations to share resources in order to enhance both organisations' performances while staying separate entities. These kinds of alliances date hundreds of years back in time when cooperation was needed to overcome high initial costs to operate effectively, e.g. the United East Indian Company in the 15th century (Bell, 1994). In more recent years *(from the 1980s onwards)* alliances are established to overcome the rising research and development expenditures, rising complexity of solutions, globalisation of business, and size-increasing incumbents (Kilubi & Haasis, 2016; Teece, 1986). Therefore, multiple reasons may underlie the motive for organisations to conduct business in alliances, for example alliances makes it possible to: (1) reduce costs and risks, (2) access specific knowledge, (3) gain *(enhanced)* access to markets, (4) benefit of the other's reputation, (5) create entry barriers, (6) create market control, (7) increase efficiency, and (8) access certain assets (financial, technological and firm assets) (Bell, 1994; Bell & Jagersma, 1992).

Different forms of alliances exist, which are mainly classified as equity or as non-equity based alliances. The distinction between the two forms is dependent on the governance to structure the alliance.

▪ *Equity alliances* are alliances in which partners agreed to exchange resources (equity); i.e. technological, human capital, and financial capital. Partners may decide to set up a separate entity to share these resources, which is called an JV. These JVs got their own administrative entity and management teams who control the work on a daily basis. The management teams consist out of employees from both partners and are incentivised to increase the value of the JV (Gulati & Singh, 1998).

▪ *Non-equity alliances* are often called contractual alliances and do not involve any exchanges of equity (Gulati & Singh, 1998). In a contractual alliance, the partners coordinate the activities together without separate entities or partners joining each other's executive team. Hence, contractual alliances do not have a systematic control process. Examples of contractual alliances are technology transfer agreements and distribution agreements. This literature review will not elaborate further on non-equity alliances, as the research focuses on JVs.

Prior to the establishment of an JV, both partners agree to common objective to be achieved within the JV, these goals are in the interest of both partners (goal congruence). However, the common objective set out in the JV's strategic direction will be changed throughout the lifetime of the JV, since the goals have to be adjusted to internal and external events (Ariño, 2003). Next to these events, partners may also develop private objectives overtime. These private objectives, when pursued on the expense of the common objective, is called opportunistic behaviour. Because this research focuses on technology transfers, opportunistic behaviour becomes a challenge for both partners (Gulati & Singh, 1998). These transfers are marked by high uncertainties about controlling the appropriation of the technology. An organisation sharing the technology has to determine what knowledge of the technology is to be shared and what is to be kept proprietary. The more knowledge is shared within the alliance, the better the knowledge transfer will be between the organisations. However, this also creates an opportunity for a partner to abuse the JV by acting opportunistic to appropriate proprietary assets. Acting opportunistic enables a partner to gain more than the other partner from an JV, e.g. by stealing proprietary knowledge. Opportunistic behaviour is dependent on the power each partner has, which is expected to differ in asymmetric JVs due different endowments of resources.

The prior part introduced the theory behind JVs, this chapter will now focus on the research perspective: asymmetric JVs. The definition to distinguish between asymmetric JVs and symmetric JVs is that asymmetric JVs are collaborations between organisations which do not correspond in size and therefore differ in reputation and strategy; e.g. large established firms that are collaborating with smaller sized organisations (Pérez et al., 2012). Small organisations are likely to be more explorative oriented, but are financially constrained to fully develop and commercialise an innovation to the market. However, large firms are more likely to have finance to research, develop, and commercialise innovations, but are too rigid to recognise opportunities across their established market (Beamish & Jung, 2005). By collaborating, small organisations are able to cover their lack of exploitation by quickly developing products, which is critical for their survival inside a fast changing competitive environment. Large organisations are able to be more explorative by recognising opportunities (e.g. in niche areas) and trends to enact on by collaborating with small organisations (Kalaignanam, Shankar, & Varadarajan, 2007).

Symmetric JVs are alliances characterised by similarities in complementarity and fit *(strategies, organisational processes, and visions)*. Due these similarities it is likely that only similar sized organisations collaborate, hence the name symmetric JVs (Pérez et al., 2012). Due to market challenges to overcome entry barriers, it is becoming more and more important for smaller sized organisations to ally up with larger organisations to gain financial investments. These alliances are not characterised by similarity and fit, but are characterised by dissimilarities in e.g. strategy *(as explained above; exploitative versus explorative)*, equity involvement *(low versus high)*, organisational processes *(flexible versus rigid)*, and absorptive capacity *(low versus high due difference in R&D investments (Belderbos, Carree, Diederen, Lokshin, & Veugelers, 2004))*. These dissimilarities introduce new risks and threats to asymmetric JVs which do not exist or are minor in symmetric JVs (Alvarez & Barney, 2005; Chen & Chen, 2002; Kalaignanam et al., 2007; Pérez et al., 2012):

- *Unfair appropriation of profits* due imbalance of power. Researchers showed that many collaborations between small and large organisations fail due the unfair allocation of profits and conflicts. Most of the times the large partner cumulated most of the profits by which the smaller partner was put at financial risk.
- *Less formality:* Asymmetric alliances are less formal than symmetric alliances due the fact that small firms are perceived as a low risk activity by the larger firms due their resource constraints to compete.
- *Greater risk of opportunism:* The larger party is more likely to be opportunistic than the smaller party due the dependency of the smaller firm to the larger firm.
- *Knowledge appropriation:* The larger party is able to fully appropriate the knowledge of the smaller partner's innovation, since full understanding is needed to develop and commercialise the innovation. Once it learned about the innovation it can start to underinvest in the alliance.

Due to the asymmetric characteristics, the larger firms are enabled to exert more power over the smaller firm in the alliance which creates a power imbalance. This imbalance enables the larger organisation to accumulate more rents from an JV than the smaller sized organisation.

2.4.3 ALLIANCE RENTS

The performance of an JV is based on several rents and is based on the resource based view. The resource based view identified the (in)tangible resources from which an organisations may gain competitive advantage by gaining additional rents (Barney, 1991). Lavie (2006) expanded the resource based view by including the rents gained from alliances. These rents were not included before, because the resource based view argued that no rents may be gained from assets that are not completely owned by an organisation. However, Lavie argued that an organisation does not need full control of another organisation's assets to accumulate rents to its own benefit, because competitive advantage can also be achieved by sharing resources.

In an alliance, both organisations decide what amount of resources are shared with the other partner, which results into non-shared and shared resources between the partners, see Figure 2. The amount of non-shared and shared resources affect the total amount of rents which can be accumulated by an organisation in an alliance. Without any alliance, an organisation would only accumulate internal rents, which relate to the rents gained from leveraging its own resources.
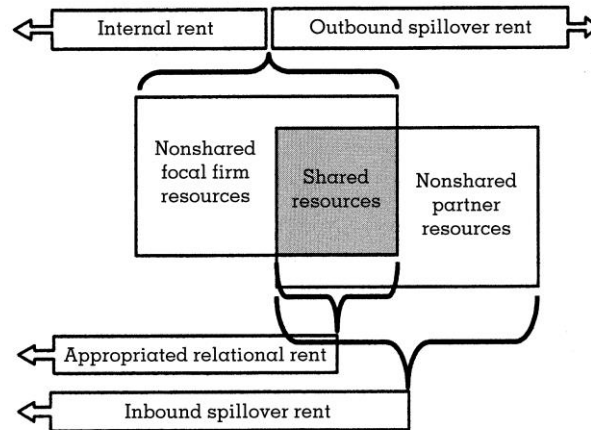
Figure 2 - Composition of rents accumulated by one firm in an alliance (Lavie, 2006)**.**

If organisations collaborate, then additional rents are accumulated which are labelled as relational rents and are gained from leveraging the shared and non-shared resources of the partner and may be distinguished into three types of rents: (1) appropriated rents, (2) inbound spill over rents, and (3) outbound spill over rents (Lavie, 2006).

1. _Appropriated rents_ cannot be generated individually by an organisation, because they need to be extracted from the shared resources of both alliance partners.
2. _Inbound spill over rents_ relate to the partner's (non)shared knowledge that is leaked to the focal partner. This knowledge can be applied within the focal organisation's internal resources to improve their competitive position.
3. _Outbound spill over rents_ relate to the focal organisation's knowledge leakage to the other partner. This spill over is a negative rent following from an alliance, because it harms the focal organisation's competitive advantage.

Relational rents are affected by the following factors; (1) relative opportunistic behaviour, (2) Contractual agreements, (3) relative absorptive capacity, (4) relative scale and scope of resources, and (5) relative bargaining power. These factors are supported by other authors as well, e.g. the review article of Ren, Gray, and Kim (2009) discussed nine determinants that affect JV performance, which greatly align with the factors discussed by Lavie (2006).

1. _Relative opportunistic behaviour;_ partners may decide to act opportunistic by cheating and or pursuing private goals at the expense of the other partner(s) and the common goal of the JV. Opportunistic behaviour will result in unfair appropriation of relational rents by the partners, as one partner is advantaged and the other is disadvantaged. When a partner perceives that it is disadvantaged by the action of the other partner, then she is less incentivised to trust this partner and will disinvest in the JV, which results in lower relational rents (Chen & Chen, 2002; Mahamadou, 2016).
2. _Contractual agreements;_ JVs include contractual agreements to structure the JV. The degree of formalisation may be decreased by increasing levels of trust among the partners (Gulati & Singh, 1998). The increasing level of trust promotes cooperative behaviour that positively affects the relational rents gained from the JV (Ireland & Webb, 2007). Contracts can also be used to protect the non-shared resources, which limits the spill over rents.

3. _Relative absorptive capacity;_ firms expect to learn new information from its partner to apply within their core-business. The degree of absorptive capacity is dependent on an organisation's resource availability and history. The bigger the absorptive capacity of an organisation, the better it is able to identify and exploit information which increases the amount of inbound spill over rents.

4. _Relative scale and scope of resources;_ the bigger the amount of shared resources will result into more relational rents. Also relational rents will be bigger when the shared resources are complementary rather than similar resources. For example, if both partners will contribute similar resources, then the same rents could be achieved by internal rents alone.

5. _Relative bargaining power;_ the contracts specified at the establishment of the JV will determine the power each partner has in the JV. Because contracts are likely to be incomplete, the partner with the most bargaining power will accumulate more relational rents during an alliance.

This report will focus how the rents affect the JV performance, with respect to how successful the JV was in obtaining the common strategic direction of the JV. Hence, this report will only focus on the appropriated rents from an JV, since the inbound and outbound rents are private objectives and will only improve the performance of one organisation itself. By which the JV may be perceived as successful for one organisation while it is not for the other. The appropriation rents is dependent on the cooperative behaviour of both partners which will result in the achievement of the common strategic direction of the JV. This strategic direction will not be achieved if one partner decided to act opportunistic, since this will limit cooperative behaviour and thus the appropriated rents from the JV will be reduced.

The JV performance is influenced by the innovations made which requires cooperative behaviour (appropriation rents). Through commercialisation of the jointly made innovations new financial returns are provided (Roper & Hewitt-Dundas, 2015), which increases JV performance. But, to measure these appropriation rents and or JV performance, one cannot simply use the same indicators which measure the performance of independent organisations with objective indicators (Larimo, Nguyen, & Ali, 2016). Objective measures such as financial indicators e.g. profits, growth, return on assets, and return on equit*y* (Bell & Jagersma, 1992) are not sufficient to measure the JV performance alone, because:

- JVs may not have matured yet, and thus no innovations have been introduced yet to commercialise on the market (Geringer & Hebert, 1990).
- JVs may have different objectives which makes objectively measuring JV performance hard, _e.g. JVs may pursue financial gains or explore technologies_ (Ariño, 2003).
- One partner may observe the alliance as successful, because next to the common objective she also gained from pursuing private objective (opportunistic behaviour). While the other partner may perceive the alliance as unsuccessful, because the other party behaved opportunistic rather than cooperative (Gulati, 1998).
- JV performance is perceived as successful when the common goal is achieved despite bad financial returns, and vice versa an alliance is seen unsuccessful if the common goal is not achieved despite good financial returns to both of the partners (Geringer & Hebert, 1990).

Therefore, Gulati (1998) and Lunnan & Haugland (2008) argue that due the multifaceted objectives of alliances, performance becomes asymmetric; one party may obtain its objectives, while the other does not. To evaluate the true JV performance they both argue that both subjective and objective measures should be used. These objective measures relate to the (1) duration, (2) survival, and (3) stability of the alliance. The subjective measures relate to the satisfaction of each partner on the JV's outcome; whether the JV achieved their goals.

2.4.4 HYPOTHESIS DEVELOPMENT

This chapter focused on the theory behind alliances, the motives for organisations to ally with other organisations, and which major alliance structures are used. Due recent market barriers, such as globalisation of business and rising research and development costs, smaller organisations have to collaborate with larger sized

organisations to overcome these market barriers. In asymmetric JVs it is expected that the larger organisation will contribute the most financial resources into the JV, because when compared to the smaller sized organisations the larger organisations possesses more resources.

Hypothesis 1.1 – Larger sized organisations in asymmetric JVs will invest the most financial resources more frequently than the smaller sized organisations.

To gain insight in the amount of existing asymmetric JVs the following null hypothesis is developed. This hypothesis will determine the relevance of this thesis, e.g. when the amount of asymmetric JVs is very small compared to symmetric JVs, then the relevance and usefulness of the results will be low for JVs worldwide.

Hypothesis 1.2 (null) – The amount of symmetric JVs outweigh the amount of asymmetric JVs which are established in the last 10 years.

Hypothesis 1.2 (alternate) – The amount of asymmetric JVs outweigh the amount of symmetric JVs which are established in the last 10 years.

To increase the relational rents of an JV, several factors were mentioned by Lavie (2006), which will be described in the following chapters. Firstly, opportunistic behaviour will be discussed on how it affects JV performance, secondly the power imbalance chapter will be discussed on how it promotes opportunistic behaviour in asymmetric JVs, and lastly trust is discussed on how it increases JV performance.

2.5   OPPORTUNISTIC BEHAVIOUR

2.5.1   OPPORTUNISTIC BEHAVIOUR

Opportunistic behaviour is the strengthening of oneself on the expense of the other party without agreement of this party (Das & Rahman, 2010; Dussauge, Garrette, & Mitchell, 2004). Examples of this are; releasing proprietrary information, not meeting the set quality standards, free-riding, or failing to pay certain fees (Xue, Yuan, & Shi, 2016). This type of behaviour is seen to be most prevalent in technology collaborations in which the core technology of one partner may be appropriated by the other, which puts the focal partner's survival at risk (Walter, Walter, & Müller, 2015). Opportunistic behaviour is emergent when acting opportunistic is profitable according to the transaction costs theory or in other words: when the benefits of acting opportunistic outweigh the expected benefits from collaborating (Xue et al., 2016). In the most extreme case, an organisation may establish an JV with long-term strategic plans to jeopardise the survivability of the other organisation to deter future competition (Walter et al., 2015).

To overcome the threat of opportunistic behaviour, formal and relational exchanges can be used. Formal mechanisms are contracts that explicitly mention the framework of the alliance: e.g. policies, procedures, objectives and expected behaviour (Luo, 2002). To prevent knowledge being spilled over, firms can specify what is proprietary in contracts. When these contracts are breached, then trust among the partners will be reduced (Becerra, Lunman, & Huemer, 2008). Due bounded rationality, it is not possible to control all the intended actions of the partners within an initial contract at the establishment of an JV (Beamish & Jung, 2005). Partners could use contractual gaps as opportunity to act opportunistic. Hence, opportunism emergent from the degree of formalisation cannot be controlled due bounded rationality. However, the risk of opportunism will affect the relational exchanges between the partners, which is defined as trust in this thesis. Jiang, Li, Gao, Bao, and Jiang (2013) showed that the relationship between opportunism and trust is U-shaped. When the risk of opportunism is low, then the partners are more likely to trust each other. However, when the risk of opportunism increases, then the partners are less incentivised to cooperate as their knowledge may become vulnerable for appropriation. This results in a reduced degree of cooperation which reduces the trust among the partners. But,

when the partners perceive each other trustworthy, the risk of opportunism may increase when the private benefits of cooperating start to outweigh the common benefits gained from the JV.

2.5.2 VARIATIONS

Walter et al. (2015) identified two types of opportunistic behaviour common in alliances: strategic manipulation and knowledge appropriation. These types of opportunism are also applicable to the JV alliance structure.

- *Strategic manipulation:* This kind of opportunism involves a partner influencing the other partner's strategic orientations to their own interest and on the expense of the other party. This type of opportunism is seen as high-stake opportunistic behaviour, because it involves unethical behaviour and has drastic consequences for the other partner. To remedy this kind of opportunism is almost impossible, because one partner gained from this behaviour while the other partner is put at a major risk. Hence, strategic manipulation may result most likely into the end of an JV. Strategic manipulative opportunism affects the appropriation rents from the alliances, because one organisation will start to pursue private goals on the expense of the common goal set at the establishment of the JV. This kind of opportunism will get recognised by the other organisation's management team, which will reduce their investment in the JV since the common goal will not be likely met.

- *Knowledge appropriation:* The second type of opportunism relates to the unintended *(tacit and explicit)* knowledge spillovers between the partners. These spillovers are not controlled by the managers and is mostly done at the JV's operating level at which engineers from both organisations interact. This kind of opportunism is rather low-stake opportunistic behaviour as knowledge spill overs mostly happen without the consent of the managerial team. This kind of opportunism relate to the inbound and outbound spill over rents identified by Lavie (2006). If a partner identifies *(proprietary)* knowledge being used by the other partner that leaked through knowledge spill-overs, then it could also attempt to pursue usage of knowledge spill-overs. The relational mechanism between the partners could justify this mild level of opportunistic behaviour (Walter et al., 2015).

Absorptive capacity of each organisation in an asymmetric JV promotes opportunism, since the organisations differ in the amount of absorptive capacity. Absorptive capacity is "*the ability of a firm to recognise the value of new, external information, assimilate it, and apply it to commercial ends which is critical for its innovative capabilities Cohen and Levinthal (1990)*". The degree of absorptive capacity is dependent on the assets each organisation has. In an JV partners both purse the common goal which is set up at the start of the JV, however during the alliance partners may develop and pursue private goals (Ariño, 2003). These private goals are beneficial to the partner as they gain more from the alliance than expected. These private goals include knowledge spill-overs *(knowledge appropriation)*. The larger sized is likely to have a bigger absorptive capacity due the availability of more assets, by which it will identify more useful knowledge spill-overs, and thus will pursue more private goals over time, hence increasing opportunism. Pursuing these private goals could be achieved by steering the JV's common goal to the partner's own private goals (strategic manipulation).

2.5.3 DETERMINANTS

The study of Das and Rahman (2010) identified significant factors influencing opportunistic behaviour, which are based on economic, relational, and temporal subjects. They identified that (1) equity involvement, (2) cultural diversity, and (3) alliance horizon are the most significant factors influencing opportunism in JVs.

1. *Equity involvement:* JVs involve investments made by both partners to develop pursue business. This equity involvement will make both partners incentivised to pursue the common goal and not act opportunistic as they run the risk to lose their investments. And thus the more equity invested, the less an partner will act opportunistic due the lock-in effect. *(negatively related to opportunistic behaviour)*

2. _Cultural diversity:_ Unfamiliarity increases the conflicts between the partners, hinders communication and increases misunderstanding (Beamish & Jung, 2005; Das & Rahman, 2010). These factors influence the work process on a daily basis in an JV, which harms the performance of the JV. Due misinterpretation of one partner's behaviour, the other partner may perceive the behaviour as threatening and act upon this, which increases opportunistic behaviour. These cultural differences do not only relate to organisational differences but also to industry and national differences (Gulati, Wohlgezogen, & Zhelyazkov, 2012). _(positively related to opportunistic behaviour)_

3. _Alliance horizon:_ Due the fact that JVs are long term oriented to achieve a long term goal, JV partners realise that they will have to cooperate in order to achieve these long-term results. Also when unfair appropriation of profits emerge, partners may perceive this as less threatening in a JV as there is sufficient time to even out the imbalance. A partner will not act jeopardize the alliance relationship if it has an equity in the alliance and foresees many projects in the future. _(negatively related to opportunistic behaviour)_

A recent study showed that opportunistic behaviour does not result from one individual factor alone, but that opportunism is rather a multidimensional phenomenon (Xue et al., 2016). Their models showed that the level of ability of the alliance partners has the major impact on opportunistic behaviour. The difference in ability creates a power imbalance between the partners; a partner with high ability has more power to make strategic changes than a partner with low ability (who is dependent on the high ability partner).

2.5.4 HYPOTHESIS DEVELOPMENT

This chapter showed that the most common opportunistic behaviours are strategic manipulative and knowledge appropriation, and are influenced by the following factors: equity involvement, cultural diversity, and alliance horizon. JVs involve investments made by both partners to develop an innovation. This equity involvement will make both partners incentivised to pursue the common goal and not act opportunistic as they run the risk to lose their investments. However, the larger partner in the JV will be likely to invest more than the smaller partner and thus will have more power when deciding over strategic decisions in the JV's management team (Chen & Chen, 2002; Mahamadou, 2016). Due this power imbalance the larger partner possesses the major part of control and could pursue strategic private goals at the cost of the common goal. Strategic opportunism influences the performance of JVs, since one partner may steer the JV's strategic direction to its own private objectives on the expense of the other party by underinvesting in common objective of the JV (Alvarez & Barney, 2005). Hence opportunisitc behaviour will result in less relational rents accumulated by both organisations.

The opposite of opportunistic behaviour is goal congruence in which both partners are incentivsed to pursue the common objective of the JV because it will give them both more competitive advanatage than pursuing private objectives. Goal congruence thus limits opportunistic behaviour due the fact that the common objective is more valuable than private objectives for both partners. The cooperation required to achieve the common goal will positively affect the JV performance. In the hypotheses below, goal congruence is chosen instead of opportunstic behaviour to make positive relationships in the conceptual model later on.

> _Hypothesis 2.1 – Goal congruence is positively related with the JV performance._

If a partner starts to pursue private goals without notifying the other party, then this could have serious consequences on the performance of the alliance as the common goal will not be likely to be met anymore. This type of strategic manipulation is expected to negatively influence the trust among the partners because the opportunistic partner cannot be trusted to behave cooperative anymore. When goal congruence exists, the cooperative behaviour of both organizations will improve their trust towards each other, since both partners perceive the other partner to act cooperative rather than opportunistic (Ireland & Webb, 2007).

> _Hypothesis 2.2 – Goal congruence is positively related with trust._

Knowledge appropriation opportunism relates to the inbound and outbound spill over rents and will not affect the JV's performance but the performance of a partner itself. This is argued because partners participating in alliances do want to learn from each other's shared and non-shared resources. These knowledge leakages are inevitable and apply to both partners. The knowledge leakages help a partner to strengthen its competitive position by leveraging this knowledge in its internal resources; internal rents (Lavie, 2006). These rents do not influence the performance of the JV, hence knowledge appropriation opportunism is not included in this research.

Lavie (2006) argued that due the relative bargaining power an organisation is able to act opportunistic, which is supported by another study which also showed that power imbalance is related to opportunism (Xue et al., 2016). Therefore, the next chapter will focus on how power imbalances promotes opportunistic behaviour.

2.6 POWER IMBALANCE

The authors Casciaro and Piskorski (2005) argue that partner dependency is related to the resource criticality and alternative partners. A partner is dependent in proportion to the other partner's resources and inversely dependent on the availability of other actors providing the same resources. These factors imply power imbalance and mutual dependence. The level of power imbalance and mutual dependence determines the partner's capability to acquire rights to use certain resources of the other partner. The partner with the most power should be aware of alternative providers when acting opportunistic, since it could incentive the other partner to leave to other actors providing the same resources when mutual dependence is low. However this is less of a problem in an JV, by which the partners are locked-in due equity involvement and contracts, which prevent actors leaving the alliance to other providers (Casciaro & Piskorski, 2005). Because mutual dependence is expected to be a minor factor influencing the partner dependency on each other, the factor power imbalance will be reviewed below.

2.6.1 POWER

Nyaga, Lynch, Marshall and Ambrose (2013) argue that a power imbalance affects the collaborative behaviour (relational factors) and adaptive behaviour (transactional factors). Because, a power imbalance increases the risk of opportunistic behaviour (relational factor) or is used to appropriate a major share of the value (transactional factor). Collaborative behaviour relates to the preservation of the relationship without any self-interest, and adaptive behaviour relate to the transactions made within the alliance to adjust to each other, e.g. equity investments. In the case of power asymmetry, the weaker partner is put vulnerable as the powerful partner may calculate that it is more beneficial to act opportunistic on the expense of the weaker partner. However, if the powerful partner acts benevolent and does not act opportunistic, the weaker partner will be more incentivised to cooperate. Highly adapted partners respond to each other with increased levels of trust and thereby the JV performance will be enhanced due increased cooperative behaviour.

Nyaga et al (2013) uses two types of power to classify power imbalances, non-mediated and mediated power:

- Non-mediated power refers to the expertise and reputation of each partner.
    - A *balanced* non-mediated power balance would imply that both partners have the same degree of expertise and do not desire each other's reputation. This balance would belong to alliances in which the scope is to increase the scale of their field of operations to reduce costs. Since both firms have the same interests: decreasing the costs of operations, it is expected that this negatively affects the level of strategic opportunism.
    - An *unbalanced* non-mediated power balance relates to one partner desiring the other's expertise and reputation, which incentives the weaker partner to put more effort in the relationship to increase its appropriation of rents. In asymmetric JVs it is expected that the larger partner has the

most expertise (e.g. employees and machines) in which the JV is operating. Alliances characterised by unbalanced unmediated power balances imply that partners want to learn from each other, which reduces the degree of overlap in private goals. Due the dissimilarity it is expected that this positively affects strategic opportunism.

▪ Mediated power refers to the coercive, legal, and reward power of each partner. Coercive and legal power relate to influencing the other partner based on control and contractual agreements.

 ○ A *balanced* mediated power balance would imply that both partners have contributed the same amount of resources to the JV. This type of power balance is expected in asymmetric JVs in which both partners are incumbents but differ from size.

 ○ An *unbalanced* mediated power balance is expected to prevail in asymmetric JVs, as the larger partner is likely to have contributed more to the JV than the smaller partner. A power imbalance (coercive and legal) in mediated power will negatively affect the relationship due legal intimidation and coercion by the stronger partner. Reward power positively affects the relationship, as the other partner is incentivised to reciprocate this gesture.

Note that if mediated power is equal (both partners invested equally), that unmediated power could still make a power imbalance and vice versa. If both are equal, no power imbalance will exist, which is expected to limit strategic opportunism.

2.6.2   HYPOTHESIS DEVELOPMENT

Bargaining power is positively related with the degree of control a partner has over changing the strategic direction of the JV to her own private objectives (Ren et al., 2009). Pursuing private goals without the consent of the other actor is regarded as opportunistic behaviour. The bargaining power of each partner is dependent on the resources they have contributed to the JV. These resources relate to equity, knowledge, expertise, and status. A power imbalance between parties does not directly relate to conflicts, but does increase the risks (e.g. opportunistic behaviour) for the weaker partner. The stronger partner is able to coerce the weaker partner to conduct businesses which it would not have done otherwise (strategic opportunism). The weaker partner might be incentivised to agree with the stronger partner's proposals in fear of losing presence in the JV. This shifts the common objective to private objectives, which reduces the performance of the JV with respect to the degree of initial goal fulfilment. Due opportunistic behaviour the degree of goal congruence is limited, as one partner is not incentivised anymore to pursue the common objective but is incentivised to pursue her own objectives. Steering the strategic direction is only possible when the strategic direction has changed during the JV, a moderator should be added to the conceptual model to explain this relationship.

> *Hypotheses 3.1– Control power is negatively related to goal congruence when the strategic direction has changed.*

> *Hypotheses 3.2 - Control power is not related with goal congruence when the strategic direction has not changed.*

If the stronger partner does not use its power to steer the strategic direction to her private goals, then goal congruence exists. The weaker partner may perceive the stronger partner as more benevolent, which is beneficial for their commitment and relationship building (Nyaga et al., 2013). The power of each partner is determined by the amount of resources (e.g. equity or expertise) each partner contribute to the JV.

> *Hypothesis 3.3 – The degree of financial resources invested is positively related with control power.*

> *Hypothesis 3.4 - The degree of expertise in the JV is positively related with control power.*

Due the fact that the participating organisations are asymmetrically sized, it is likely that the larger partner contributes the most financial resources (which is formulated in hypothesis 1.1), and thus accumulates the most power in the JV. One could expect that the more asymmetric an JV is, the more reasonable it is that the larger organisation will invest the majority of financial resources in the JV. This is argued because an entrepreneurial firm's resources are a nihility when compared to the resources of a very large incumbent. When the turnover ratio is low, it is more likely that the larger or smaller organisation will invest the most resources because the resource endowments of both are noticeable.

> *Hypothesis 3.5 – If JVs get more asymmetric, then the larger organisations will invest the majority of financial resources more frequently.*

This chapter focused on the power imbalance affecting opportunism of partners in JVs. Power imbalances may relate to non-mediated and mediated power imbalances. As argued in the opportunistic behaviour theory section, opportunism affects the degree of trust among the partners. Trust in an organisational setting differs from trust among individuals, which will be discussed in the following chapter.

2.7   TRUST

Trust has been showed to positively affect the performance of JVs (Gulati & Singh, 1998; Kale et al., 2000). However, when the risk of opportunism increases, partners start to trust each other less by which the performance of an JV is eventually reduced. A lot of theory about has been written about trust and how to measure this, see the review article of Fulmer & Gelfand (2012). This chapter will focus on the interplay of interpersonal and interorganisational trust (Zaheer, McEvily, & Perrone, 1998). First, the general concept of trust will be introduced after which interpersonal and interorganisational trust are discussed.

2.7.1   WHAT IS TRUST?

People have to depend on each other's behaviour when working together to achieve certain objectives. For example, a partner may choose among different actions while working together which will result in different outcomes. These different outcomes may result in either successful or non-successful JVs. While successful JVs relate to straight and loyal dealing, commitment, and agreement with the set contracts, the non-successful JVs relate to foul play, distorting information, misleading partners, unfair appropriation of profits, and providing below average quality products (Das & Teng, 1998). The latter type of behaviour is also called opportunistic behaviour, which was introduced in the previous chapters.

Hence, the outcome of an JV is not certain and thus implies risk for both partners. The risk is related to the uncertainty of the outcome of activities performed by other partners (Beers & Zand, 2014). To reduce this risk, trust is needed. The term trust has been explained in many ways, the following broadly accepted definition of trust will be used (Fulmer & Gelfand, 2012; Mayer, Davis, & Schoorman, 1995): *the individual (the trustor) agrees to make herself vulnerable to the other individual (the trustee), she does this because she believes that the trustee will perform actions which will be beneficial to her. However she is unable to monitor or control the trustee's actions, which puts the trustor at risk as she is vulnerable to the uncontrollable actions of the trustee*. Full trust implies that the trustor has certainty that the trustee will perform the actions as promised without opportunistic behaviour. Increasing trust encourages a trustee to take risks, by which the trustee is trusted by the trustor not to act opportunistic when deviating from the usual way of doing things (Robbins & Judge, 2013). Important to note is that it is possible that the trustor may trust its trustee while this does not apply vice versa, hence different trust levels are presents between two individuals. This is due to the propensity to trust which determines the trustworthiness of individuals. The trustor's propensity is determined by its experiences and personality type by which he or she perceives different levels of trust (Mayer et al., 1995).

Several types of trust were identified by Rousseau, Sitkin, Burt, and Camerer (Denise M. Rousseau, Sitkin, Burt, & Camerer, 1998) which are calculative, relational and institutional trust. Calculative trust is based on the rationality of an individual and looks for the credible information in the trustee, e.g. reputation, diplomas, organisational culture, and contractual safeguards (Schilke & Cook, 2015). This information provides the trustor sources to verify the trustee's trustworthiness. The rationality refers to the trade-off between the negative sanctions and the benefits of opportunistic behaviour. Next, relational trust is based on the interactions over time between the trustor and trustee. Due increasing experience through years of successful collaboration, individuals will develop more close bonds with each other over time, which positively affects their perception to each other's trustworthiness (Das & Teng, 1998).
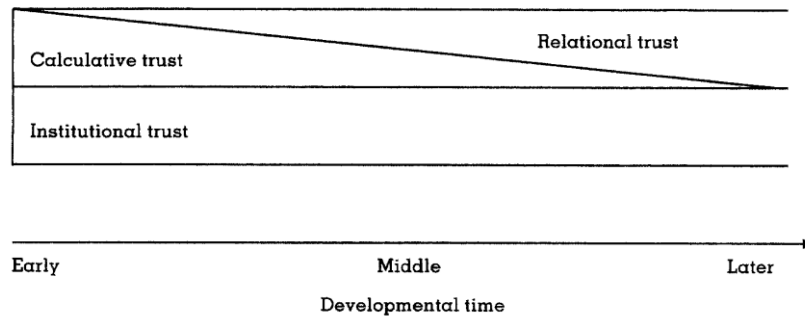
Figure 3 - Calculative, relational, and institutional trust (Denise M. Rousseau et al., 1998).

Working together gives rise to new opportunities and initiatives which would not have been identified at the start of the collaboration. These opportunities could incentivise opportunistic behaviour. When a violation occurs in the relational trust setting, it is likely that the relationship will be restored. However, when a violation occurs in a calculative setting, the relationship will be likely to be ended. This interplay is visualised in Figure 3, in which calculative trust turns into relational trust over time. The figure also shows a constant degree of trust; institutional trust. This kind of trust is based on the contractual safeguards to control the partners' behaviour to deter opportunistic behaviour. These formal mechanisms makes it financial beneficial for the partners to act trustworthy and cooperative (Schilke & Cook, 2015). Trust is increased due the reduced level of risk, improved action through enhanced trustful behaviour, and by promoting faith in activities which cannot be monitored.

2.7.2   INTERFIRM RELATIONSHIP

Now the concept of trust is explained and how it emerges over time, the literature review will discuss interpersonal and interorganisational trust. The prior parts focused on trust operating at individual level, however to focus on trust in an interfirm relationship the interplay of interpersonal (close to individual trust) and interorganisational trust should be assessed (Fulmer & Gelfand, 2012; Zaheer et al., 1998). Interpersonal trust is defined as the trust between an individual of organisation A and an individual in organisation B. Interorganisational trust is the collectively held perception of trust of organisation A towards organisation B, see Figure 4 on the next page.

Zaheer et al. (1998) argue that interorganisational trust is determined by the reliability, predictability and fairness of the other organisation. These factors enable trust between partners which facilitates information sharing that this information will not be used for opportunistic behaviour. An increasing degree of trust may increase the JV performance through the following facts: employees are more willingly to help each other out, employees are more willingly to speak out, and less concealment of information (Robbins & Judge, 2013). However, an increasing relational openness may give raise to new opportunities. Conflicts may emerge about the appropriation of future profits of these opportunities which are not set in the explicit agreement (Zaheer et al., 1998).

To assess an interfirm relationship, the individual and organisational level should be assessed simultaneously (Zaheer et al., 1998). Thus to review the effect of interorganisational trust in asymmetric JVs, the interpersonal level should also be reviewed.
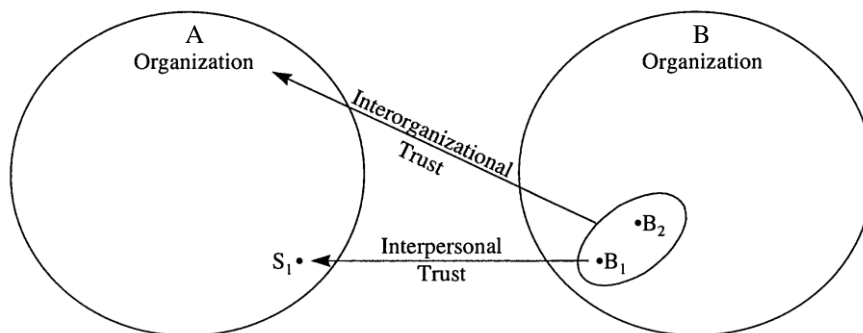
Figure 4 - Interpersonal and interorganisational trust (Zaheer et al., 1998)**.**

Over time, interactions between the different organisations may evolve into a stable and trustworthiness relationship *(interorganisational trust),* however employees may come and go during the relationship *(interpersonal trust).* When a new employee enters the collaboration, she will become familiar with the interorganisational trust between the organisations. Eventually she will translate the explicit and tacit processes in her interpersonal trust towards her counterpart in the other organisation (Zaheer et al., 1998). Although due to propensity to trust, the new employee might perceive the level of trust and risk differently than its predecessor which will influence the collectively-shared trust and thus affects the interorganisational trust over time. The following parts will focus on the factors influencing the interpersonal and interorganisational trust over time.

2.7.3 TRUST FACTORS

Interpersonal trust has an effect on interorganisational trust in the long run which was just explained. The interpersonal trust will facilitate individuals' cooperation with each other and will reduce the need to monitor and control each individual to prevent opportunistic behaviour. Individuals in a team setting will take upon more risks as they perceive that they are able to trust other team members (Robbins & Judge, 2013). These personal relationships include emotional attachments and are characterised by Lioukas & Reuer (2015) without having direct economic benefits. This type of trust help partners to not act in a self-interested way, since this behaviour may degrade the relationship.

Trust between individuals is dependent on the perception of trustworthiness from the trustor to the trustee. This perception is effected by three main factors: the trustee's ability, benevolence, and integrity which will be explained below (Mayer et al., 1995). This model by Mayer et al. is also called the ABI-framework and is regarded as the prominent model to conceptualise trust (Schilke & Cook, 2015).

- *Ability,* the trustee's competencies and skills
- *Benevolence*, the trustee's intended actions are to benefit its trustor
- *Integrity,* the trustee's honesty and truthfulness to the trustor

The relationship of the above mentioned factors is as follows: a trustor (A) may perceive trustee (B) to be competent enough to provide a certain product (ability). This implies only that B is able to produce, but does not imply that B will produce for A (integrity), and thus B cannot be trusted yet by A. If A is certain that B is integer, it will imply that B will produce according A's requirements. However, B can still choose not to deliver the goods to A (benevolence). Next, B should be perceived as benevolent to be certain that B will produce, agree to A's requirements, and that B will deliver the goods to A in order for A to trust B. If A has an increasing perception of

the factors, A will have more trust and thus be willingly to take upon more risk by handing out activities to B rather than to perform them by herself (Schoorman, Mayer, & Davis, 2007). The trust relationship between a trustor and trustee can be assessed with the social exchange theory. The relationship is enhanced when the trustee takes upon a risk and has beneficial effects to the trustor. However if the trustor perceives an imbalance in the exchange (the risk was bigger than the trust, e.g. knowledge appropriation), then the relationship will be harmed (Fulmer & Gelfand, 2012). An enhanced relationship allows the trustee to take on bigger risks as the trust by the trustor increases and thus is willingly to accept bigger risks (Mayer et al., 1995).

Other factors influencing the trust are; prior and future alliances, shared characteristics, business ethics, cultural diversity values, informal meetings, pilot projects, relationship length, interfirm contracts, relational openness, mutual dependence, and control of the involved partners (Fulmer & Gelfand, 2012; Jong, 2016; Poppo, Zhou, & Ryu, 2008). To limit the total number of factors influencing trust, the ABI framework will be chosen to assess trust, as most of the other factors are explained by this model, such as prior and future alliances will make partners more aware of each other's ability *(ABI: ability)*, business ethics (ABI: integrity), and relational openness *(ABI: benevolence).*

2.7.4   HYPOTHESIS DEVELOPMENT

This chapter assessed what the concept trust entails, how it emerges over time in a relationship, how it functions between organisations, and what factors influence trust. If partners cooperate to work on the common goal set in the JV, then this will positively affect the JV performance. Overtime, the partners develop a better relationship which facilitates effective communication through which the partners share more information and less conflicts emerge due mutual understanding (Robbins & Judge, 2013). The increased relationship translates into higher levels of trust, which is an important factor for JV performance (Jong, 2016).

The increased levels of trust make sure that the other partner will act according to achieve the common objective set at the establishment of the JV. If a partner is able to trust the other partner in pursuing the common objective then it will exchange more resources and knowledge into the JV. However, if a partner is not able to trust the other partner, then it will start to disinvest in the JV by withholding information and resources (Ireland & Webb, 2007).

> *Hypothesis 4.1 - Trust is positively related with JV performance.*

A mediating effect should be included in the conceptual model, because trust and goal congruence are expected to positively affect JV performance, and goal congruence is also expected to positively affect trust.

2.8   CONCEPTUAL MODEL

In this chapter the conceptual model will be built on the basis of the hypotheses. From this model it is able to test the hypotheses with statistics to assess whether the relationships are valid or not. The following relationships are hypothesised:

- 2.1 – Goal congruence is positively related with JV performance.
- 2.2 – Goal congruence is positively related with trust.
- 3.1 – Control power is negatively related to goal congruence when the strategic direction has changed.
- 3.2 – Control power is not related with goal congruence when the strategic direction has not changed.
- 3.3 – The degree of financial resources invested is positively related with control power.
- 3.4 – The degree of expertise in the JV is positively related with control power.
- 4.1 – Trust is positively related with JV performance.

Between the variables control power and goal congruence, there is a moderator. This is expected because strategic manipulative opportunism cannot occur when the strategic direction has not been changed during the lifetime of the JV.

The visualised conceptual model is not the same as the initial conceptual model used to design this research due to the insufficient Cronbach's alpha statistic of the construct power imbalance *(see 3.6.1.5 - Reliability analyses)*. Also, the multiple regression analysis to predict JV performance suggested the presence of a mediating effect; in which trust mediates the relationship of goal congruence and JV performance *(see 4.6.2- Mediator trust)*. In order to prevent confusion between the old and new conceptual model, only the updated conceptual model will be discussed from now on.
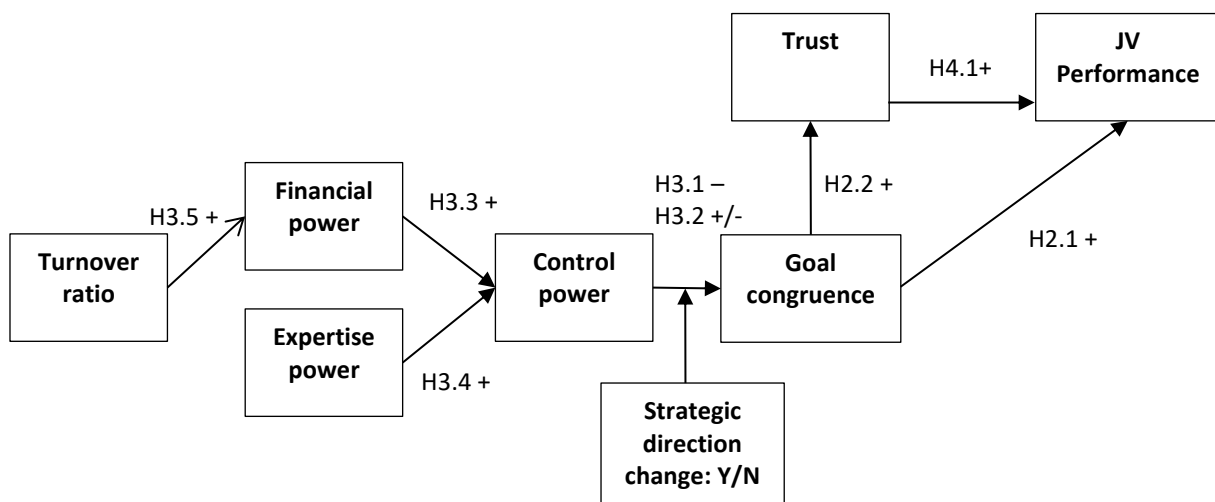
Figure 5 – Conceptual model.

The conceptual model does not include the following three hypotheses, since it does not fit the model. For hypotheses 1.1 and 3.5, the research perspective has to be changed to the perspective of the larger sized organisation only. The conceptual model above takes upon the research perspective of both the smaller and larger organisations. Hypothesis 1.2 tests a distribution of symmetric and asymmetric JVs which is not included in the above model.

- 1.1 – Larger sized organisations in asymmetric JVs will invest the most financial resources more frequently than the smaller sized organisations.
- 1.2 – The amount of symmetric JVs outweigh the amount of asymmetric JVs which are established in the last 10 years.
- 3.5 – If JVs get more asymmetric, then the larger organisations will invest the majority of financial resources more frequently.

2.9   CONCLUSION

This chapter introduced the relevant literature around the concepts used in the research objective. The factors which determine the rents of an alliance, were close to the factors introduced in the first chapter. These factors relate to the asymmetry between partners, power (im)balance, opportunistic behaviour, and trust. Based on the literature around these factors, a conceptual model is established together with hypotheses. To address the first central question: *"What is the relationship between power imbalance, opportunistic behaviour, trust, and JV performance?"* the following relationship has been retrieved from the literature review. Power imbalance is

theorised to negatively affect goal congruence which is explained as the inverse of opportunistic behaviour. Goal congruence is hypothesised that it will positively affect trust and JV performance. Due the last relationship a mediating effect is visualised in the conceptual model; trust mediates the relationship of goal congruence and JV performance. Next to the mediating effect, a moderator is included, since strategic manipulative opportunism is only possible when the strategic objective of the JV has been changed.

To test whether the hypotheses are valid or not with statistics, data measuring the variables is required. Therefore, the following chapter will discuss the method on how this data is retrieved and how this is prepared to conduct statistical analyses later on.

3.1   SUMMARY

The first step in retrieving the required data was to use an alliance database to identify JVs which have been established in the period of 2007 until 2016. From this database the JVs were filtered to symmetric and asymmetric JVs on basis of a turnover ratio. Next, contact persons of these asymmetric JVs were sent a survey that addressed the operationalised variables. The survey gave result to 205 responses from which 97 responded that the requested information was too confidential to share, and 77 returned a completed survey of which 59 were from asymmetric JVs, 15 symmetric JVs and three from unidentified JVs. The sample size is sufficient to identify large effects with enough statistical power. The survey response was processed in order to deal with missing values and outliers which reduced the sample size to 57. Next, the factor and reliability analyses showed that the survey questions measuring the trust and power imbalance variables cannot be combined into one construct due the lack of reliability.

3.2   INTRODUCTION

This study used a cross-sectional survey design to assess the relationship of opportunistic behaviour and trust on the performance of asymmetric JVs. To replicate this study, the methodology used to address the hypotheses is described in this chapter. This is done with the following four subsections: (1) research design, (2) measurement and variables, (3) data collection, and (4) data analysis. The research design discusses which design choices were made in order to retrieve the required data. The second section operationalised the variables which were deduced from the literature in order to be able to measure the variables with a survey. The third part will cover how the required data was retrieved by using an alliance and financial database and a survey. The latter part focusses on how the data from the third part was organised and analysed. In overall this chapter addresses the following central question: *"How can the relationship between power imbalance, opportunistic behaviour, trust, and JV performance be observed within asymmetric JVs established in the last ten years?"* which is done by reviewing the method on how the data was obtained to observe the relationship later on in statistical analyses.

3.3   RESEARCH DESIGN

The previous chapter identified the variables that belong to the research objective. To answer the research objective, the research design in order to retrieve the required data will be discussed. The purpose of the study is to gain insight how opportunistic behaviour and trust influence the performance of JVs owned by asymmetrically sized partners. A descriptive study is chosen to measure the relationships among the variables.

The theory discussed in the literature review identified important variables influencing JV performance, which are opportunistic behaviour, power imbalance, and trust. Researching the definitive cause-and-effect relationships between these variables is not possible, since only the variables influencing the JV performance which were found to be important are included within the theoretical framework. Hence, not all variables are included which makes researching a cause-and-effect impossible. Therefore, this research will conduct a correlational study to delineate the identified variables with JV performance. This aligns with the fact that it is not expected that this research is given the authority to change certain variables within the study setting (the JV itself) for the sake of research. This is argued as this could jeopardise the competitiveness of an JV. Hence, this research will be conducted in a non-contrived study setting.

The unit of analysis is the asymmetric JV, which will be measured with a survey tapping the variables required to answer the research objective. Because the asymmetric JV is an organisation, a respondent from either the smaller or larger participating organisation should provide information surrounding the asymmetric JV. A survey design is selected, since this research will be done in a quantitative way. Also surveying enables the research to

be more efficient than by conducting personal interviews (Sekaran & Bougie, 2009). Secondary data from databases will be used to obtain information about asymmetric JVs worldwide. From this data contact details will be looked up via internet searches. After retrieving sufficient contact details, primary data will be collected by surveying the asymmetric JV partners. Because the survey will be directed at executive level, a small amount of questions can only be included within the survey. This is argued because a very long survey will be discarded due to the time required to complete it. To even further increase the likelihood of increasing the response rate, the majority questions will be closed-questions.

The research will only focus on recently established JVs to increase the rate and the confidentiality of the response. Specific characteristics of an JV that has been terminated over ten years ago are probably to be faded away in the respondent's memory and or the subject might have left the organisation already. The respondents will only be asked to fill in the survey once, which implies that the time horizon of this research is cross-sectional.

The response of the survey will be used to answer the research objective by using statistics. Significant statistic results will be based on a confidence level of 95 out of 100 cases (p = .05).

3.4 MEASUREMENT AND VARIABLES

The literature review discussed the theory surrounding the hypotheses, variables and which factors affect them. However, not all factors cannot be taken into account and only the most important factors can be used. As explained before, the survey size is limited due the fact that executives are expected to be busy and a long survey is not likely to be returned.

First, the control variables are listed after which the following variables are operationalised: (1) asymmetric JVs, (2) JV performance, (3) opportunistic behaviour, (4) power imbalance, and (5) trust.

3.4.1 CONTROL VARIABLES

The following control variables are used:

- Joint ventures   The data from the alliance database is filtered on the JV alliance structure.
- Amount of partners   The amount of partners is controlled to two partners. In the case of two owners, one owner has to control only one partner instead of multiple partners, which reduces the likelihood of conflicts emerging during the alliance. Especially in the case of asymmetric JVs in which dissimilar administrative structures give raise to new conflicts could make the relationship even more complex to understand when more than two partners are selected (Beamish & Jung, 2005).
- Time frame   The timeframe in which the JVs are established is between January 2007 – December 2016 (10 years).
- Nationality   No restrictions are made to the country of origin of the JV partners.
- Industry   The JVs are controlled to the SIC - Division D, Manufacturing. This division will be discussed in Chapter 3.5.3 – Sample characteristics.
- JV age   To control the research the JV's operation time is included. The longer the duration, the more chance of knowledge spill overs or other opportunistic behaviour (Kale et al., 2000). The JV age is measured in weeks and relates to the date of establishment of the JV until April the 1st 2017 if the JV is still operating. If the JV was terminated, then the latest date of a news article describing the JV's termination was used to calculate the JV age.

3.4.2 VARIABLE ASYMMETRY

There is no accepted framework yet to characterise an asymmetric alliance, but is mostly defined as the difference in the firm size of the participating partners (Mahamadou, 2016). This study operationalises firm size in the amount of turnover, like the author Rothaermel (2001) did within his article. The distinction between symmetric and asymmetric JVs differ in terms of availability of resources and organisational structures. Symmetric JVs are similar sized organisations who collaborate together, and both will likely possess an equal amount of resources. While asymmetric JVs are collaborations between non-similar organisations, e.g. large established firms and small firms (Pérez et al., 2012). The larger company will have far more resources, while the smaller organisation will be more likely to possess innovative ideas. By collaborating they fill in each other's resource gap. To operationalise asymmetric JVs, a distinction should be made between the size of firms.

The study of Beamish & Jung (2005) acknowledged the problem of using the terms of small, medium and large sized companies to determine size asymmetry, because a partner with 999 employees could be defined as medium sized, while the other partner with 1001 employees would be defined as a large sized company. To cope with this problem they have used an asymmetry ratio based on a financial figure of both organisations. The operationalisation of asymmetric JVs will be done in the turnover ratios of each JV. To calculate the turnover ratio, the annual turnover of the largest organisation is divided by the annual turnover of the smallest organisation. This ratio is controlled to at least five to determine size asymmetry between firms, like the authors Kalaignanam et al. (2007) did in their article about asymmetric alliances.

3.4.3 VARIABLE JV PERFORMANCE

The literature review introduced that due the multifaceted objectives of JVs, performance becomes asymmetric; one party may obtain its objectives, while the other does not (Gulati, 1998; Lunnan & Haugland, 2008). To evaluate the true JV performance they both argue that both subjective and objective measures should be used. Lunnan & Haugland (2008) identified three groups to measure JV performance across the literature: financial, operational, and effectiveness. Financial indicators do not necessarily indicate the performance of an alliance as this could be influenced by other strategies conducted by the parent firms. Therefore, this research will only be focussed on the operational and effectiveness groups which are commonly used across the literature.

- *The operational group* relates to objective indicators: the duration, survival, and stability of the JV. (1) Duration relates to the longevity of the alliance. (2) Survival relates to the termination of the JV. (3) Stability relates to the stability of the ownership and governance (contracts) of the JV. However, to use these objective measures extra knowledge is needed about how these measures interact (Ariño, 2003; Ren et al., 2009). Because if an JV gets terminated, it could suggest that the partners fulfilled the set objectives or failed to meet them.
- *The effectiveness group* relates to subjective indicator: the goal fulfilment of the strategic direction set up by the partners prior the establishment of the JV. Financial returns of an organisation may be the objective of one JV, but this might not apply for another JV which is conducting research to understand certain technology better (Ariño, 2003; Larimo et al., 2016). Therefore, the goal fulfilment of the strategic direction indicates the performance of an JV.

When the performance is perceived as poor by a partner, a partner will attribute this to the other partner or other causes depending on the satisfaction with the other partner. The partner will decide to keep the alliance alive *(survival),* wait for better times to achieve the objectives *(duration),* or will change the contractual agreements to influence the other party's behaviour *(stability).* By continuing the JV, the goals may be eventually be fulfilled after which the JV may be terminated. However, the JV could also be terminated because the partners do not trust each other anymore, which could be influenced by changing the contractual agreements.

The JV's performance will be operationalised with the following factors: goal fulfilment and survivability (Ariño, 2003; Ren et al., 2009). One partner may be satisfied with the performance of the JV, while the other does not. This is due to the fact that one partner may have acted opportunistic on the expense of the cooperative partner. The act of opportunism will jeopardise the JV's survivability and result in an unintended termination. In the case of both partners being satisfied, the shared objective will be achieved, which will result in high goal fulfilment and later on in an intended termination if the strategic direction is to be achieved. Next, if both partners are dissatisfied, then this will lead to low goal fulfilment and an unintended termination of the JV.

- When partners are both satisfied, then this will result into high goal fulfilment and an intended termination.
- When one partner is satisfied and one partner is dissatisfied, then this while result into low goal fulfilment and an unintended termination.
- When both partners are dissatisfied, then this will result into low goal fulfilment and an unintended termination.

Note, that in the case of both partners or in the case of one partner being dissatisfied about the performance that it will give the same result; low goal fulfilment and an unintended termination. If one or more partners are dissatisfied, then appropriation rents will not be gained by either of the parties. To gain appropriation rents, cooperation is needed since these rents cannot be generated individually. If one party is dissatisfied, it will start to underinvest in the JV and will not act cooperative anymore (Gulati et al., 2012), which negatively affects the performance. Thus to measure JV performance the variables goal fulfilment and survivability will be used. Satisfaction cannot be measured, since this is asymmetrically perceived during the JV. Goal fulfilment relates to the fulfilment of the strategic direction and survival to the (un)intendent survival or termination of the JV.

3.4.4 VARIABLE OPPORTUNISTIC BEHAVIOUR

This study will focus on the strategic manipulative opportunistic behaviour identified by the authors Walter et al. (2015). Strategic manipulative opportunism influences the performance of an JV, since one partner may steer the shared objective to its private objectives on the expense of the other party. This steering is more likely to prevail when there is a power imbalance, which is likely to exist between asymmetric-sized partners, in which the larger-sized partner will possess more (resource-based) power. Strategic manipulative opportunism is less likely to be expected when the shared objectives serves both partner's interests (goal congruence). Because if the shared objective aligns with both partners' interests, then steering the shared objective to a partner's private goals will leave both disadvantaged, since the shared objective will not be achieved.

Knowledge appropriation opportunism relates to the inbound and outbound spill over rents and will not affect the JV's performance but the performance of a partner itself. This is argued because partners participating in alliances do want to learn from each other's shared and non-shared resources. These knowledge leakages are inevitable and apply to both partners. The knowledge leakages help a partner to strengthen its competitive position by leveraging this knowledge in its internal resources; internal rents (Lavie, 2006). These rents do not influence the performance of the JV, hence knowledge appropriation opportunism is not included in this research.

Measuring opportunistic behaviour via second data (e.g. via news articles) is most likely to be impossible, because it is related to strategic directions of an firm and therefore is regarded as proprietary information. Therefore it will be collected by surveying executives whom are informed about the JV. Also the questions will not directly ask for the degree of opportunistic behaviour, but will be asked via the degree of goal congruence.

3.4.5 VARIABLE POWER IMBALANCE

To measure the power imbalance in an JV, questions should be asked which assess the degree of non-mediated and mediated power. Variables included in mediated power are the degree of expertise, coercive and legal

power. Coercive and legal power are based on the contractual agreements made before the establishment of the JV. It is likely that the partner who contributed the most has the most control in the making up these contracts. Thus coercive and legal power are grouped in resource based (financial) power. To check whether financial power indeed translates into more control power, control power is measured as second variable.

The third variable tapping non-mediated power is expertise power. The other non-mediated power variables, reputation and reward power, are not included to narrow down the scope of the research. Also these variables are expected to contribute the least, since an unbalanced expertise power is expected to make the weaker partner to look up to the stronger partner's reputation and way of doing business.

Thus to measure power imbalance, three variables will be measured: expertise power, financial power, and control power.

3.4.6 VARIABLE TRUST

Trust is the relationship between the partners and is based on their trust and communication quality towards each other. Two different types of relational trust are distinguished: interpersonal and interorganisational trust (Fulmer & Gelfand, 2012; Schilke & Cook, 2015; Zaheer et al., 1998).

A survey should be used to measure trust, however questions like *"do you trust them"* should not be used but instead questions like *"do you trust them to do x"* should be used (Mayer et al., 1995). The questions should be addressed to the executive level to understand interorganisational trust, since this level develops the strategic actions (Schoorman et al., 2007). To measure trust, questions should address (1) the ability, (2) the benevolence, and (3) the integrity *(ABI-framework)*.

3.5 DATA COLLECTION

This chapter will address all the instruments that were used to collect data. To test the hypotheses, data was collected via several databases and by distributing a survey.

3.5.1 ALLIANCE DATABASE

To obtain information about established JVs worldwide, the database SDC Platinum was used. This database is owned by Thomson Reuters and is part of their Financial and Risk solutions. The database offers details over a million merger and acquisitions deals worldwide since the 1970s; including over 140,000 JV agreements (Thomson Reuters, 2017). Next to this database, there are other popular databases containing JV agreements, like Core, Merit-Cati, and Bioscan. However, from these databases, SDC Platinum was the only alliance database that was available for this study and appeared to be the most frequently used in top journals (Schilling, 2009).

To obtain the required data from the database, the following options were used in SDC Platinum.

- *Alliance data announced:* 01/01/2007 to 12/31/2016; to filter down alliances for the last 10 years.
- *Alliance*: Select all Joint Ventures; SDC includes non-equity and equity based alliances.
- *Custom report*; Organisation names, country, SIC Code, alliance SIC code, alliance date announced, and contact website.

The former selection gave 37,918 results while the latter selections reduced this number to 21,421 JVs. After retrieving the data from the alliance database some other selections were made to comply with the study at hand.

- *Statuses*: only JVs with a completed/signed, expired, extended, renegotiated, and terminated status were selected. The statuses like letter of intent, pending, rumour, rumour discontinued, and seeking to form could imply JVs that have never existed. This selection reduced the number of JVs to 7,274.
- *Number of partners*; a selection has been made on the number of participating organisation in an JV, because this study focusses on the relationship between organisations. This study will only focus on JVs which are owned by two organisations. Three or more involved organisations will make the relationship too complex to understand. This selection reduced the number of JVs to 6,422.
- *Missing values*; the data provided by the alliance database was not entirely perfect. To cope with this, all the JVs with missing values were deleted. Most of these omissions were unidentified JV partners. This selection reduced the number of JVs to 6,174.

These 6,174 JVs were coupled with financial data in order to distinguish between symmetric JVs and asymmetric JVs. This data was retrieved from the financial database Orbis, which the next chapter will elaborate upon.

3.5.2 FINANCIAL DATABASE

The financial data required to calculate the turnover ratio between the participating organisations was mainly retrieved by using the Orbis database. The Orbis database is a product offered by Bureau van Dijk and possesses financial and organisational information of over 200 million organisations worldwide (Bureau van Dijk, 2017).

The selection of JVs from the alliance database (N = 6,174) was coupled with the Orbis database to check whether sufficient financial information could be retrieved. The 6,174 JVs included 10,214 unique companies, from which Orbis provided a 66.7% (N = 6,814) match rate. This rate is not 100% since the organisation names provided by the alliance database differ from the organisation names in the financial database which made matching the organisations impossible for the program used, e.g. company X Ltd. and company X Limited, or the alliance database mentioned unknown subsidiaries of organisations. From the 6,814 organisations there were 4,723 organisations which listed their financial information about their annual turnover. Again this is not 100% due the fact that privately owned organisations are not required to provide full financial information (Inc, 2017). This resulted in 1,608 JVs with turnover data, from which the turnover ratio (TR) could be determined.
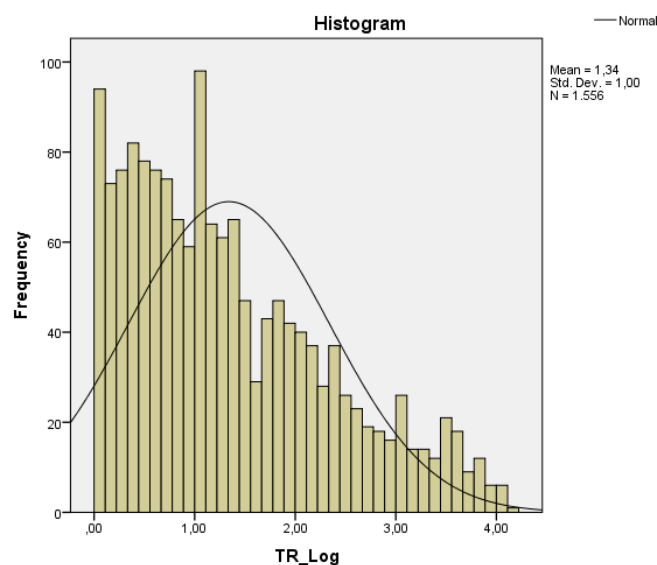
Figure 6 - Histogram of turnover ratio on a logarithmic scale (N = 1.556).

The 1,608 JVs were analysed with SPSS to gain insight in the descriptive statistics (see Figure above and Annex I) and the distribution of symmetric and asymmetric JVs. The turnover ratio within this model is transformed with

a logarithmic scale (magnitude 10) to deal with skewness, because the interval of the turnover ratio ranges from one to over one million. The extreme turnover ratios are probably JVs established between entrepreneurial firms and large incumbents (e.g. major petrol or pharma industries). The data is controlled on outliers, which have been deleted to review the descriptive statistics (N = 1,556). The turnover ratios of the included JVs without outliers ranges from one to around 13,000 ($0 < TR_{log} < 4.12$). On average these JVs have a turnover ratio of 21.9 ($TR_{log} = 1.34$) and a median of 13.1 ($TR_{log} = 1.12$), which suggests that most JVs are established between asymmetric sized organisations.

The distinction between symmetric and asymmetric JVs is made at a turnover ratio of 5.0 ($TR_{log} = 0.70$). Because the distribution of the turnover ratios is now known, hypothesis 1.1 can be validated. The null hypothesis 1.1 is tested with an one sample t-test (Annex I): *"The amount of symmetric JVs outweigh the amount of asymmetric JVs which are established in the last 10 years."*. The result of this test is that the difference between the hypothesised mean and actual mean is significantly different, which implies that the null hypothesis should be rejected. Hence, the alternative hypothesis is accepted: *The amount of asymmetric JVs outweigh the amount of symmetric JVs which are established in the last 10 years.*

The distribution of asymmetric JVs is 69.2% *(TR > 5.0)* while the distribution of symmetric JVs is 30.8% *(TR < 5.0)*. Over the timeframe which is used for this research (Figure 7), it can be seen that in every year asymmetric JVs outweigh the symmetric JVs. The drop of the total number of established JVs in 2009 and 2010 is most likely the consequence of the worldwide economic crisis which started in 2008.
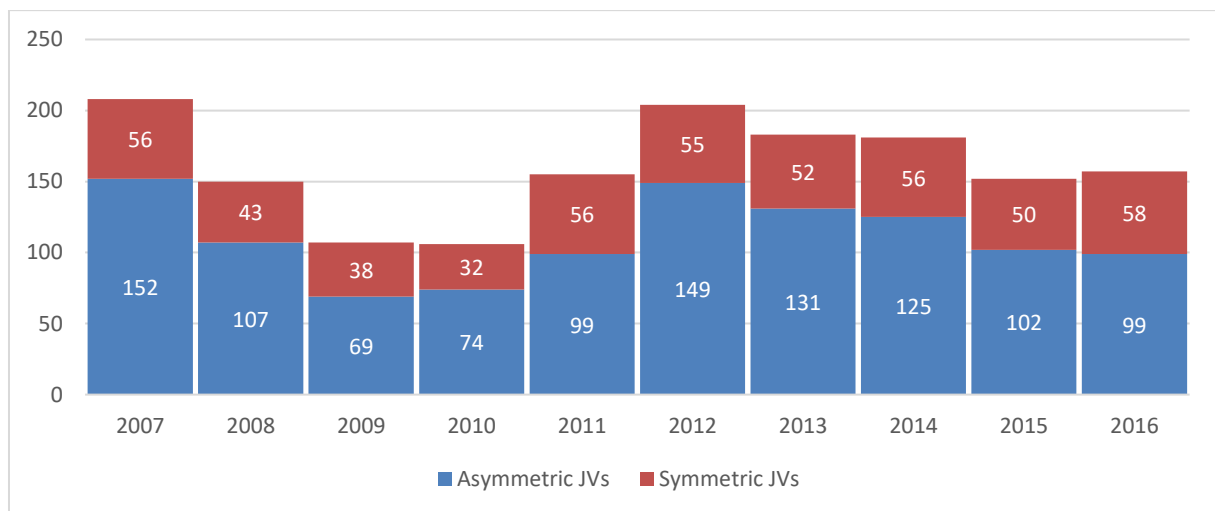
Figure 7 - Distribution of (a)symmetric JVs over the last 10 years.

3.5.3   SAMPLE CHARACTERISTICS

The study will look into JVs which are established worldwide in the last 10 years; from January 2007 until December 2016. The analysed JVs are controlled to the manufacturing division according to the Standard Industrial Classification (SIC). SIC codes are used to identify the primary business of organisations, which enable researchers to structure their research for specific business activities (U.S. Environmental Protection Agency, 2006).

Table 1 shows the different divisions of the SIC together with the number of established JVs in the study's time frame. The chapter about the alliance database and financial database showed that there were 1,608 JVs identified together with financial data in order to calculate the turnover ratio. This sample is reviewed in the following two tables, which give insight in how many JVs operate in each SIC division and how many JVs operate in each group within the SIC D division.

SIC Range	Division	Name	n	% of total	Cumulative %
01-09	A	Agriculture, forestry, and fishing	17	1.06%	1.06%
10-14	B	Mining	162	10.07%	11.13%
15-17	C	Construction	84	5.22%	16.36%
20-39	D	Manufacturing	482	29.98%	46.33%
40-49	E	Transportation, communications, electric, gas, and sanitary service	197	12.25%	58.58%
50-51	F	Wholesale trade	71	4.42%	63.00%
52-59	G	Retail trade	50	3.11%	66.11%
60-67	H	Finance, insurance and real estate	237	14.74%	80.85%
70-89	I	Services	299	18.59%	99.44%
91-99	J	Public administration	9	0.56%	100.00%
		Total	**1608**	**100.0%**	**N/A**

The manufacturing division is chosen because this industry is marked by product innovations to stay competitive. Also multiple authors choose this division to include within their strategic alliance research (Geringer & Hebert, 1990; Kalaignanam et al., 2007; Xue et al., 2016). Other innovative divisions, like division E, were not chosen because the manufacturing division provided sufficient JVs to include within the study. Because each JV has two participating organisations, a total of (N = 482 * 2) 964 organisations can be contacted.

SIC division D - Manufacturing		n	% of total	Cumulative %
20	Food and kindred products	40	8.30%	8.30%
21	Tobacco products	1	0.21%	8.51%
22	Textile mill products	6	1.24%	9.75%
23	Apparel and other product made from fabric	1	0.21%	9.96%
24	Lumber and wood products	0	0.00%	9.96%
25	Furniture and fixtures	1	0.21%	10.17%
26	Paper and allied products	5	1.04%	11.20%
27	Printing, publishing, and allied industries	8	1.66%	12.86%
28	Chemicals and allied products	104	21.58%	34.44%
29	Petroleum refining and related industries	13	2.70%	37.14%
30	Rubber and miscellaneous plastics products	12	2.49%	39.63%
31	Leather and leather products	2	0.41%	40.04%
32	Stone, clay, glass, and concrete products	9	1.87%	41.91%
33	Primary metal industries	28	5.81%	47.72%
34	Fabricated metal products	22	4.56%	52.28%
35	Industrial and commercial machinery	41	8.51%	60.79%
36	Electronic and other electrical equipment	47	9.75%	70.54%
37	Transport equipment	78	16.18%	86.72%
38	Measuring, analysing and controlling instruments	12	2.49%	89.21%
39	Miscellaneous manufacturing industries	52	10.79%	100.00%
	Total	**482**	**100.0%**	**N/A**

Table 2 shows that the major groups within the manufacturing division are Chemicals and allied products (21.58%), Industrial and commercial machinery (8.51%), Electronic and other electrical equipment (9.75%), Transport equipment (16.18%), and Miscellaneous manufacturing industries (10.79%). All these groups are expected to involve technology transfers, i.e. proprietary knowledge transfer.

3.5.4 SURVEY

A survey is developed to obtain data for the variables set out in the literature review chapter. The survey questions are shown in Table 3, the full survey plus invitation letter can be found in Annex II. Table 3 does also show the used scale, interpretation of a high score, and corresponding sources.

The survey was sent via e-mail in which two options were given to the respondents to return the survey; via replying to the e-mail or via the online survey tool; SurveyMonkey[3]. The respondents were given a short survey which could be completed within five minutes in order to increase the probability of response. The majority of questions were closed questions and the respondents were promised anonymity. Anonymity was required as the survey is asking for confidential information with respect to how their organisations act in JVs. This information could be valuable for other organisations who wish to initiate an alliance with the focal organisation.

To make sure that the questions tap the variables effectively, the questions were retrieved from articles which also measured the same variable and were modified into statements. The Likert scale was used to examine whether the respondents agree or disagree with the statements for the questions 1 until 9. The used Likert scale uses a seven-point scale and is visualised in Figure 8.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Entirely Disagree | Mostly Disagree | Somewhat Disagree | Neither Agree nor Disagree | Somewhat Agree | Mostly Agree | Entirely Agree |
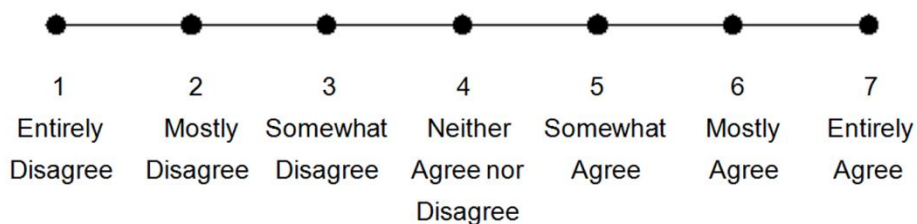
Figure 8 – Likert seven point-scale (Beshai, Branco, & Dobson, 2013)

The questions 10, 11, and 12 uses another scale to determine the amount of financial power, expertise power and control power of each JV partner. These questions are not asked on a ratio scale, since expertise power and control power are hard to objectify. Next, this makes it possible to change the perspective of the sample to either the larger or smaller organisation; e.g. an smaller organisation which invested the minority amount of financial resources into the JV could be translated to the larger organisation that invested the majority amount. This inversion is required to answer hypotheses 1.1 and 3.4.

Question 13 confirms whether a respondent was informed enough to answer the questions. Employees at the operational level of an JV are not expected to be as informed as employees at executive level. Question 14 assesses the JV performance objective rather than subjective. Questions 2b, 4, 5, and 8 were negatively phrased in order to reduce the tendency of respondents to answer at one side of the Likert scale.

The respondents were promised confidentiality, hence none of the respondents contact details and or (organisation) names will be reported within this thesis or elsewhere. The response including the contact details will only be available at request by this thesis' committee members of the Delft University of Technology, if the legitimacy of this thesis has to be checked.

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[3] www.surveymonkey.com

Table 3 - Survey questions.

Construct	Question	Scale	(high) Score indicates	Similar to source
Performance				
Goal fulfilment	1. The joint venture is successful in meeting its strategic direction (insofar).	Likert (7)	high performance	(Ariño, 2003; Becerra et al., 2008; Lavie, Haunschild, & Khanna, 2012)
	If the joint venture is still operating please answer 2a, if not, please answer 2b.			
Survivability	2a. The termination of the joint venture is still as specified within the contracts.	Likert (7)	high performance	(Ariño, 2003)
Survivability	2b. The termination of the joint venture was unintended	Likert (7)	low performance	(Ariño, 2003)
Objective measure	14. Please determine which percentage of the joint venture's goals are achieved (insofar)? -- *e.g. 25%, 50%, or N/A.*	Likert (7)	high performance	N/A
Goal congruence				
Goal congruence	3. Both partners could easily agree to change the strategic direction to adapt to new events	Likert (7)	high goal congruence	(Lado, Dant, & Tekleab, 2008; Silva, Bradley, & Sousa, 2012; Walter et al., 2015)
Strategic opportunism	4. The strategic direction was changed to benefit our organisation.	Likert (7)	low goal congruence	(Lado et al., 2008; Silva et al., 2012; Walter et al., 2015)
Strategic opportunism	5. The strategic direction was changed to benefit the other organisation	Likert (7)	low goal congruence	(Lado et al., 2008; Silva et al., 2012; Walter et al., 2015)
Goal congruence	6. The change of the strategic direction was done in full consent of both organisations.	Likert (7)	high goal congruence	(Lado et al., 2008; Silva et al., 2012; Walter et al., 2015)
Trust				
Benevolence	7. Our organisation would have made financial sacrifices for the other organisation if needed	Likert (7)	high trust	(Schilke & Cook, 2015)
Integrity	8. Our organisation would have taken advantage of private opportunities if they arose.	Likert (7)	low trust	(Schilke & Cook, 2015)
Ability	9. Our organisation completely trusts the other organisation in its actions performed within the joint venture.	Likert (7)	high trust	(Jong, 2016; Zaheer et al., 1998)
Power imbalance	*For the following statements please choose among: 1 = the majority / 2 = an equal / 3 = the minority, to fill in the gaps.*			

Mediated power	10. Our organisation invested …… amount of financial resources into the joint venture.	Categorical (3)	1 and 3 = imbalance 2 = balance	(Ariño, 2003; Nyaga et al., 2013)
Mediated power	11. Our organisation had ……… amount of control when deciding over the strategic objective.	Categorical (3)	1 and 3 = imbalance 2 = balance	(Nyaga et al., 2013)
Non-mediated power	12. Our organisation had ……… degree of expertise compared to the other organisation in the joint venture.	Categorical (3)	1 and 3 = imbalance 2 = balance	(Nyaga et al., 2013)
Control variable				
Function	13. What was your role in the joint venture? -- *e.g. executive, manager, employee, or other (please specify)*	String	Credibility of response	N/A

3.5.5 CONTACT DETAILS

The contact details of the respondents were retrieved by research on the internet. Retrieving contact details via personal contact, e.g. telephone, was not considered since this would be too time consuming and too expensive. Search engines were used to look up a certain JV to find people involved within this JV. The following measures were used to obtain contact details.

- *(company) Press articles* provided e-mail addresses of investor relation personnel, corporate communication personnel, and sometimes the executives involved in the JV.
- *Using the e-mail format*: press articles may quote executives without providing contact information. However, by combining the executive's name and the organisation's email format, e.g. *firstname.lastname@organisationX.com*, the right contact information could be retrieved. Also the website Bloomberg[4] was used to retrieve executives' names of a specific organisation.
- *Using Clearbit Connect*: the application Clearbit Connect[5] was used to determine an organisation's email format. The limitation of Clearbit was that it was quite biased to larger sized companies, since contact information of smaller organisations could not be identified with this application.
- *General company's email-address:* when searching for contact details or formats the general company's email-address was also found, e.g. *info@organisationX.com*. This might seem to be too general to look for certain persons, however some organisations did forward the email to the right person within the organisation.

In total 2,541 unique email address were obtained by using the measures listed above. From the initial sample (N = 964) mentioned in Chapter 3.5.2 Financial database, 1,413 unique email-addresses were identified.

To obtain an additional 1,128 e-mail addresses, the whole SIC division D – Manufacturing of the alliance database was used to obtain email addresses, instead of the ones which were coupled with the financial data. One disadvantage of this approach is that the latter email-addresses were not filtered on asymmetric JVs based on turnover ratio *(the initial sample was already coupled with the financial database to determine asymmetric JVs)*, which will result in response which is not useable for this study.

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[4] https://www.bloomberg.com/
[5] https://connect.clearbit.com/

3.5.6   RESPONSE

After reminding the persons several times, a response of 205 was collected (8.1%), which does not align with the generally accepted response rate of 30.0% (Sekaran & Bougie, 2010). The low response rate is contributed to the fact that quantity was chosen over quality. Not all 2,541 surveys were sent to executives involved in the JV, but were also sent to general e-mail addresses and investor and communication personnel. To assure quality, a question within the survey inquired for the respondent's role within the JV.

From the 205 respondents, 97 respondents stated that the requested data was too confidential to share, sixteen respondents did not answer the survey due their organisation's policy, fourteen respondents returned the survey as they were unfamiliar with the JV and one respondent notified that JV was fully acquired by one of the JV partners (Table 4). In total 77 fully filled in surveys were collected.

Table 4 – Response characteristics.

Response	Number	Percentage
Useful	77	37.6 %
Confidential	97	47.3 %
Policy	16	7.8%
Unknown	14	6.8%
Acquired	1	0.5%
Total Response	**205**	**N/A**

3.5.7   REQUIRED SAMPLE SIZE

To calculate the required sample size the program *G*Power 3.1.9.2* is used, which is developed by the Heinrich Heine University Düsseldorf (Faul, Erdfelder, Lang, & Buchner, 2007). This program calculates the required sample size based on a power analysis. The result of a power analysis will determine the amount of subjects required to detect any effect in a particular test. The main tests conducted within this research are bivariate, t-tests, and linear multiple regression analyses. A bivariate test measures the correlation between two variables, a t-test compares the means of two variables, and a linear multiple regression analysis tries to predict the outcome of a dependent variable based on one or more independent variable.

This study strives for the recommended statistical power level of .80 (β = .20) (Field, 2009, p. 58), which means that there is a 80% certainty that an existing effect will be found in a sample. Next, the required confidence level is 95 out of 100 cases (α = .05). The hypotheses within the conceptual model are directional which implies that all the tests are one-tailed.

The required sample size per test is summarised in Table 5. To calculate the sample size per effect size, each test used another criteria to determine effect sizes. Also some tests needed more input besides the α, β, and direction, which are stated below.

▪ <u>Bivariate</u> *(Exact: Correlation: bivariate normal model)*
  ○ To calculate the different effect sizes the following values were used for Pearson's correlation coefficient, r:
    ▪ Small effect, r = .10
    ▪ Medium effect, r = .30
    ▪ Large effect, r = .50

- T-test *(T-test: Means difference between two independent means (two groups))*
  - To calculate the different effect sizes the following values were for the effect size index, d (Faul et al., 2007, p. 180):
    - Small effect, d =.20
    - Medium effect, d = .50
    - Large effect, d = .80
  - The T-test's result is based on equal groups and provides the total amount of required subjects. To calculate the required subjects per group, the result should be divided by two.
- Linear multiple regression *(F-test: Linear multiple regression: Fixed model, R^2 deviation from zero)*
  - To calculate the different effect sizes the following values were for Cohen's criterion, f^2 (Faul et al., 2007, p. 180):
    - Small effect, f^2 = .02
    - Medium effect, f^2 = .15
    - Large effect, f^2 = .35
  - Number of predictors is two, which is the maximum independent variables affecting a dependent variable in the used conceptual model.

Table 5 – Required sample size to identify an effect per test.

	Bivariate	T-test (per group)	Multiple linear regression
Small effect	616	620 (310)	485
Medium effect	67	102 (51)	68
Large effect	23	42 (21)	31

Table 5 shows that the required sample size ranges from 23 *(bivariate, large effect)* until 620 *(T-test, small effect)*. The response on the survey included 77 completed surveys which represents a sample size of N = 77. Therefore the sample size is not large enough to conduct all tests together with enough statistical power to prove certain effect sizes. However, the sample size is adequate enough to identify large effects for each kind of test.

Hence, the sample size is large enough to identify at least large effects with enough confidence (α = .05) and statistical power (β = .20). Please note that the sample still has to be tested for outliers which could reduce the number of subjects in the sample.

3.5.8   T-TEST - STRATEGIC DIRECTION CHANGE AND JV AGE

Strategic directions are changed to adjust to internal and external events (Ariño, 2003). The younger an JV, the less likely the case that the strategic direction would have been changed since less events appeared to adjust to. If this is the case, then the response of no strategic direction change could suggest that this response is from young JVs, which will bias the research. If this is the case, then the majority of JVs without any strategic direction changes are notable younger than the JVs with strategic direction changes. To review this premise, a t-test is conducted to see whether the response of no strategic change belongs to significantly younger JVs than JVs with strategic direction change (Annex IV.I).

The t-test showed that there is no significant mean difference in JV age when controlling for strategic direction change, hence the premise is rejected. There is no significant difference between JVs with and without strategic direction change with regard to JV age. Which indicates that the response to strategic direction change is not biased by the age of an JV.

3.5.9 LATE RESPONSE BIAS

To check for late response bias, the sample of asymmetric JVs (N = 57) is divided into two groups to conduct an independent samples t-test. This check is made because the respondents were reminded several times to complete the survey, which could bias the results due annoyance. Group one consists out of the first 21 respondents and group two contains 21 of the last respondents. Because the response was entered in the database within one day, the data is quite chronologically ordered in the database. Each group consists out of 21 respondents because this should be sufficient to identify large differences with enough statistical power. The results of this t-test are shown in Annex IV.II.

The JVs in both groups are roughly the same age (214 vs 234 weeks) and asymmetric (355x vs 339x). Next, non-significant mean differences were found for all the included variables. Hence, no major mean differences exist between the two groups in power balance, JV performance, trust and goal congruence. Therefore, it is assumed that the response is not biased due annoyance.

3.6 DATA ANALYSIS

After the survey data was collected it had to be organised and analysed. To organise, the survey response was analysed and the data was combined with the financial database to control for asymmetric JVs. Secondly, several questions provided data which had to be reinterpreted to be useful in the analyses. To analyse the data, IBM's Statistical Package for the Social Sciences (SPSS) 23.0 was used to control for missing values and outliers. Next, the assumptions to conduct parametric analyses were tested. A factor analysis and reliability analyses were made to review the reliability of each variable from the conceptual model. The codification of the used variables in SPSS can be found in Annex III, this table can be useful when interpreting the results in the next chapter. The handbook of Field (2009) is mainly used to interpret the results of SPSS.

3.6.1 PROCESSING SURVEY DATA

To control for asymmetric JVs based on a turnover ratio of at least five, the survey data is combined with the financial database Orbis. The extracted financial data represents the JV's year of establishment. If this was not possible, because one organisation's financial data could not be retrieved for that specific year, then the most recent financial data of both organisations was used. In some cases an organisation was acquired or stopped operating by which recent financial data was not available.

The financial database did not provide information for all the respondents of the JV, to cope with these missing values additional internet searches were done to retrieve this data. In total three organisations could not be coupled with financial data, which resulted in a loss of three respondents. This data cannot be retrieved by contacting the respondents, since the respondents stayed anonymous in the online survey tool. After coupling the survey data with the financial data, 59 asymmetric JVs and 15 symmetric JVs were identified. The distinction between asymmetric and symmetric is made by using a turnover ratio of at least 5.0, in which the JV having a ratio greater than 5.0 is identified as an asymmetric JV.

After controlling the data for asymmetric JVs, the data was entered in Microsoft Excel to modify the response. These modifications are listed below.

- *Questions 2b, 4, 5, and 8*: these questions were reverse coded questions. In order to compare the data, the data from these questions had to be inversed.

- *Questions 4 and 5:* Scores from question 4 and question 5 will be combined, into Q45; which measures strategic manipulative opportunistic behaviour. These questions inquired whether the strategic direction was changed to the benefit of the focal organisations, to the other organisation, or both. In the case of both organisation being advantaged by the strategic direction change, then this would imply low opportunistic behaviour as the direction was probably changed to adjust to internal or external events. When one partner would have been disadvantaged by the strategic direction change, then this would imply the existence of opportunistic behaviour. The above explains why question four and five cannot be interpreted alone, therefore these questions' response is translated, see Table 6. High scores indicates high goal congruence, a low degree of opportunistic behaviour suggests that the initial goal are less likely to be changed. The difference is based on the response on the seven-point Likert scale. And thus a difference of 6 would suggest a score of 1 on question 4 and a score of 7 on question 5, or vice versa.

Table 6 – Translation table for combining question four and five.

Score	Meaning
7	Both partners did benefit from the change equally / or there was no strategic direction change

6	One partner did benefit a little more than the other partner did (difference is 1)
5	One partner did benefit more than the other partner did (difference is 2)
4	One partner benefited while the other did not benefit or lose from the strategic direction change
3	One partner benefited while the other lose (difference is 1 or 2)
2	One partner benefited while the other lose (difference is 3 or 4)
1	One partner benefited while the other lose (difference is 5 or 6)

In the case of identical scores to both question four and five, then the same number will be used to resemble the goal congruence. E.g. if both partners are disadvantaged by the strategic direction change (scores 1-3), then this will result in low goal congruence, as high goal congruence implies that the strategic direction is in both organisation's interest, when both partners are disadvantaged then this means that the strategic direction is not changed into their interest, hence low goal congruence.

- *Questions 2a and 2b:* these questions relate to the survival of the JV; whether it is still or was unintended or intended. After inversing question 2b (because it was reverse coded), it was able to combine question 2a and 2b to identify whether the survival of the JV is or was intended or unintended.

3.6.1.1 MISSING VALUES

The dataset included some missing values for the questions 3, 4, 5, 6, and 14. How these missing values were handled within the dataset is explained below

- *Questions 3, 4, 5, and 6:* To cope with non-response on the survey questions 3, 4, 5, and 6 additional data was entered. These questions were skipped by the respondent when the strategic direction did not change during the operation of the JV. No strategic direction change would imply no opportunity for *strategic manipulative* opportunistic behaviour for either organisation. Hence, none of the organisations was able to steer the strategic direction to their own benefit which would have negatively affected the goal congruence between the organisations.
  As a result, the initial goals set at the establishment of the JV are not changed, which indicates high goal congruence. It is assumed that the initial goals aligned in both organisations' interests, because if it did not, one organisation would not be motivated to establish an JV since it does not align with its interests. Response with no strategic direction change implies no strategic manipulative opportunistic behaviour and thus high goal congruence; all the missing data for questions 3 - 6 is replaced with 7s (high goal congruence).

- *Question 14:* Not all respondents listed the objective measure to what degree their goals in the JV were accomplished. This question will be ignored, since the reliability analysis (discussed later on) will indicate that this question does not make the JV performance variable reliable. The objective goal fulfilment may differ for each JV, one JV may have a strategic direction set out of one year while another JV might have set it out for 30 years. Hence, the degree of goal fulfilment needs additional data (strategic goals length) to understand.

3.6.1.2 OUTLIERS

All the variables were tested on outliers by checking normality distributions and box-plots. An case is regarded as an outlier when its score is very differently with regard to the rest of the other cases (Field, 2009). Outliers have to be deleted from the sample, as an outlier could heavily influence the results of an analysis. The variable

turnover ratio gave concern for outliers which can be seen on the left boxplot in Figure 9. In this boxplot (n = 59), outliers are marked with an asterisk and are plotted above the whiskers of the box-and-whisker plot. This boxplot shows all the asymmetric JVs' turnover ratios measured with the survey. If the two upper outliers in the left box plot are removed, then still six outliers would exist (middle box plot, n = 57). In order to have no outliers, these six outliers should also be deleted (right box plot, n = 51).
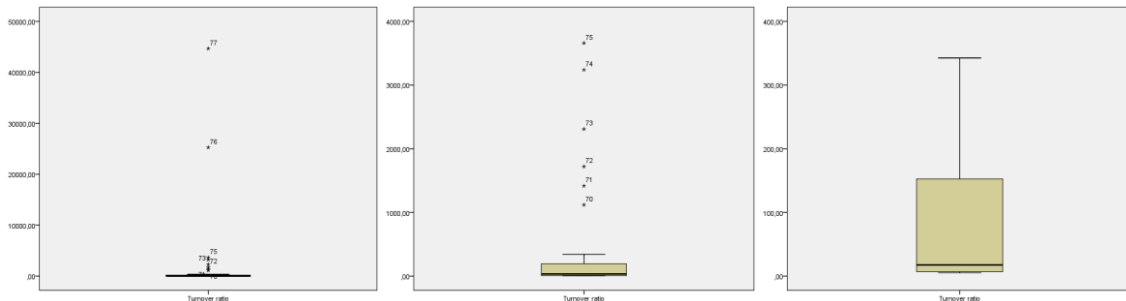
Figure 9 – Box plot diagrams of turnover ratio.

None of the above box plots showed normal distributions in their respective histograms. However deleting more cases to achieve normal distribution is not desired, since this will decrease the statistical power of the sample. The middle box plot will be chosen in which two outliers are deleted from the left box plot. These outliers range from 25,263 to 44,670 which is totally different than the remained interval in the model; 5.0 – 3,700. The right box plot will not be chosen as this will result in an additional data loss of over 10%.

After removing the outliers from the model in Figure 9, the analyses in SPSS will be done with 57 respondents (n = 57). This amount of subjects is able to provide enough statistical power to identify large to medium effects within the sample. Please note that the still existing outliers can affect the results of the analysis, however the turnover ratios are not expected to be outliers as these high turnover ratios may exist in the real world, e.g. JVs established between entrepreneurial firms and incumbents.

Questions 3, 4, 5, and 6 also show outliers due the fact that the non-response is replaced with 7s (see prior chapter). However, these outliers are expected to make sense on a Likert scale. Therefore, these outliers will not be deleted from the model.

3.6.1.3   ASSUMPTIONS PARAMETRIC TESTS

Before the relations among the variables are tested in the results chapter, the assumptions to conduct parametric tests are to be tested. This is done because the results of a parametric tests may be inaccurate when conducted with non-parametric data. If one of the assumptions for parametric data is violated, then the statistical analyses should be conducted with non-parametric analyses. Field (2009) specified the following four assumptions for parametric tests:

1. _Normally distributed data_, the data should be normally distributed. This assumption will be tested below.
2. _Homogeneity of variance_; the variances of the variables should be the same throughout the sample.
3. _Data;_ The data should be measured at interval or ratio level. The mainly used scale is the Likert scale which is considered to be measured at interval level (Sekaran & Bougie, 2009).
4. _Independence;_ requires the respondents to be independent from each other. The respondents may not have influenced other respondents. This assumption is met, since the respondents did not know which other JVs were identified within this research. Hence, the respondents were not able to contact the other respondents.

The first assumption may be assessed by looking at the histograms and the normal distribution curve. However, looking at histograms whether a plot is normal distributed is regarded as subjective, that is why this chapter will focus on quantifying the normality of the data. This is done by calculating the z-scores to see whether kurtosis and skewness are likely to occur within a sample. Kurtosis and skewness determine when the data is normally distributed. Kurtosis determines the height of the normal distribution's shape, while skewness indicate a pile-up of data on either the left or right side of the distribution. To calculate the degree of skewness and kurtosis the equations 1 and 2 are used, in which Z is the z-score, S the skewness statistic, K the kurtosis statistic, and SE the standard error (Field, 2009).

$$Z_{Skewness} = \frac{|S|}{SE_{skewness}} \qquad (1)$$

$$Z_{kurtosis} = \frac{|K|}{SE_{kurtosis}} \qquad (2)$$

Table 7 shows the outcome of the equations 1 and 2. The significance level of p < .05 is used, which requires the z-scores to be between -1.96 and 1.96 for the data to be normally distributed. Because "S" and "K" are entered as absolute values, the z-score should be below 1.96 if skewness and kurtosis are not to be significant within the sample. Multiple variables are skewed or kurtotic (z-score above 1.96), which would imply that the data is not normally distributed. The table below shows that multiple variables exceed the 1.96 threshold.

Table 7 – Skewness and kurtosis.

SPSS Code	N	Skewness [S]	Std. Error [SE]	Z$_{skewness}$	Kurtosis [K]	Std. Error [SE]	Z$_{kurtosis}$
Q1_success	57	-0.572	0.316	1.810	-1.331	0.623	2.136
Q2_survival	57	-0.797	0.316	2.522	-0.804	0.623	1.291
Q3_SD_easily_ch	57	-1.289	0.316	4.079	0.324	0.623	0.520
Q4_benefit1	57	-1.730	0.316	5.475	1.995	0.623	3.202
Q5_benefit2	57	-1.735	0.316	5.490	2.246	0.623	3.605
Q6_SD_consent	57	-2.375	0.316	7.516	4.917	0.623	7.892
Q7_finan.sacrifice	57	-0.656	0.316	2.076	-0.223	0.623	0.358
Q8_priv.opport	57	-0.025	0.316	0.079	-0.809	0.623	1.299
Q9_trust	57	-0.992	0.316	3.139	0.036	0.623	0.058
Q10_financial_p	57	-0.05	0.316	0.158	-0.936	0.623	1.502
Q11_control_p	57	-0.015	0.316	0.047	-0.457	0.623	0.734
Q12_expertise_p	57	-0.05	0.316	0.158	-0.936	0.623	1.502
Q14_achieved	50	-0.082	0.337	0.243	-1.3	0.662	1.964
Turnover ratio	57	3.381	0.316	10.699	11.389	0.623	18.281
JV_Age	57	0.539	0.316	1.706	0.113	0.623	0.181

Field (2009) argues that large samples (N = 30+) will result in low standard errors, through which the z-scores of skewness and kurtosis are influenced. He further argues that due the central limit theorem, the distribution will be normally distributed with sample sizes over 30, which is the case in this study (n = 57). Therefore, it is assumed that the sampling distribution is normal.

All the parametric test assumptions are met, which allows the sample to be analysed with parametric tests.

A factor analysis is conducted to see whether the questions from the survey cluster together. The output of a factor analysis, the component plot, shows clusters which should represent the variables used in this research. For example, multiple questions are used to measure the variable goal congruence. These questions should cluster together in a component plot for these questions to measure goal congruence reliable enough. If one question is not included in this cluster, then this would imply that this question does not belong to the variable at hand and therefore should be deleted from the total set of questions measuring the respective variable.

In order to conduct a factor analysis and retrieve a component plot, a scree plot has to be plotted first. A scree plot visualises the components which explain the most variability inside the data. The components relates to the questions asked in the survey. Figure 10 shows these components on the x-axis and shows the eigenvalue of each component on the y-axis. The eigenvalue indicates the importance of each component. An component is considered to be important enough when its value is over 1.0 (Kaiser's criterion, (Field, 2009)). The dotted red line in Figure 10 shows that the components one until five have an eigenvalue of at least 1.0, and therefore satisfies the criterium.

The number of components to study in an component plot depends on the point of inflexion, which is at the point where the slope of the line drastically changes (Field, 2009). The point of inflexion is visualised as the intersection of the blue lines in Figure 10. The point of inflexion lies between two and three components and thus indicates that two components should be considered. Each component should also have an eigenvalue of over 1.0, which is the case as the components lie above the dotted red line.
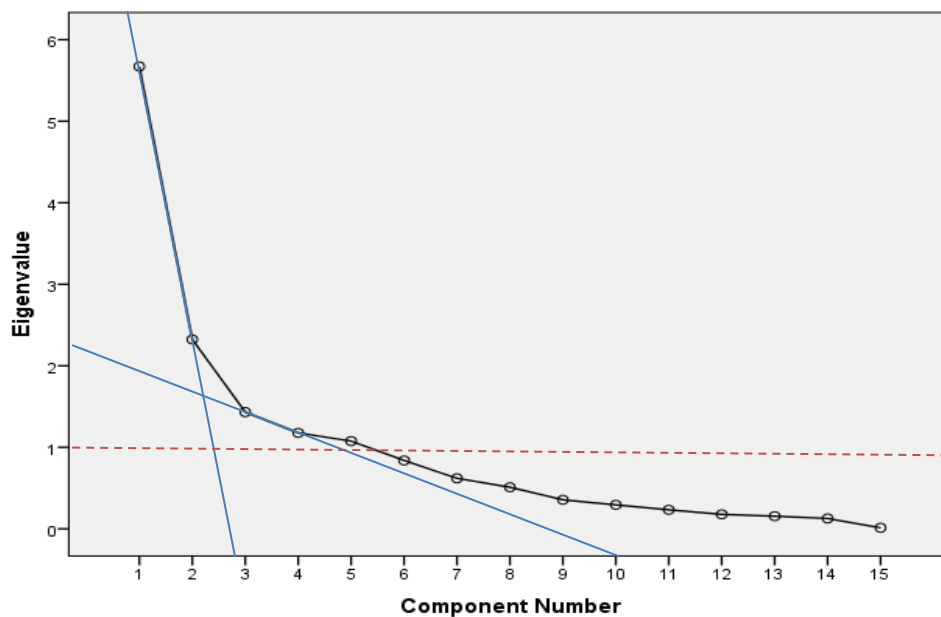
Figure 10 – Scree plot.

The point of inflexion shows that only two components can be taken into account. Because two components are selected, the clusters can be identified in an 2D-component plot (see Figure 11), which makes it easier to interpret the clusters. To increase the interpretability of the clusters even more, a varimax factor rotation is applied to the factor analysis.

The component plot, Figure 11, shows three clusters which are summarised in Table 8. This table couples each cluster with the corresponding questions and related theory.
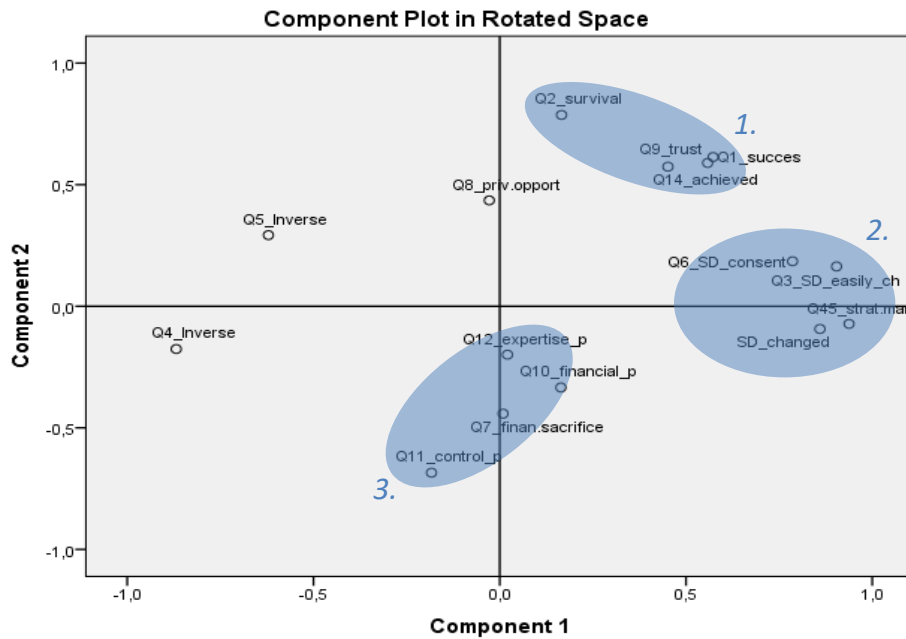
Figure 11 – Component plot 1.

From Table 8 it is learned that cluster 2 is purely measured with questions related to the goal congruence theory. However, cluster 1 and 3 include questions from different theories, both clusters include a question which is related to the trust theory. This could imply that trust, performance and power imbalance could give raise to multicollinearity which could limit the regression analyses later on. Multicollinearity exists when there is a strong correlation between the variables which are used to predict the outcome of another variable. To make sure that multicollinearity is not biasing the model, "Variance Inflation Factors, (VIF)" should be calculated to detect multicollinearity when conducting regression analyses in SPSS. The VIF will be explained later on in the next chapter.

Table 8 – Summary of clusters.

Cluster	Question(s)	Related to theory
1 – JV Performance	1, 2, and 14	JV performance
	9	Trust
2 – Goal congruence	3, 45, 6, and SD_changed	Goal Congruence
3 – Power imbalance	10, 11, and 12	Power imbalance
	7	Trust

The clusters 1, 2, and 3 do make up the expected constructs according to the theory from the literature review, however question seven and nine are misplaced in the clusters. Therefore, each construct will be analysed on their degree of reliability through reliability analyses.

3.6.1.5   RELIABILITY ANALYSES

Reliability analyses will be conducted in this section to review the reliability of the clusters identified with the factor analysis. A construct is considered to be reliable when the survey consistently measures the construct. To

measure reliability, the Cronbach's Alpha (α) should be measured, which marks reliability at values higher than .70 (α > .70) (Field, 2009). The output of the reliability analyses is put in Annex V.

CONSTRUCT PERFORMANCE

Cluster 1 from the factor analysis identified the questions 1, 2, 9, and 14 to make up the construct to measure JV performance. These questions do not establish a sufficient reliable measure (α = .24), when these questions are combined into a single construct. Therefore, question 14 is deleted from the construct to increase the reliability (α = .79). However, the construct exists out of questions which are based on dissimilar theory; question 1 and 2 measure JV performance while question 9 measures trust. To align the theory with the constructs, question 9 is also deleted from the construct. This decreases the reliability (α = .67), which is assumed to be acceptable. Although the reliability level is below the required α of .70, according to the theory these questions do make up this construct (Ariño, 2003).

CONSTRUCT GOAL CONGRUENCE

Cluster 2 contains the questions 3, 4, 5, and 6 which all measure the construct goal congruence according to the theory. Q4 and Q5 are combined into Q45, because these questions cannot be interpreted alone, which is already explained in the previous chapter: *3.6.1 Processing survey data*. The construct is reliable (α = .90), and no higher reliability can be achieved by deleting questions from the construct.

CONSTRUCT POWER IMBALANCE

Questions 7, 10, 11, and 12 measure the construct power imbalance, which is also confirmed by the third cluster in the component plot. The seventh question is deleted from the construct, because this question is not related to power imbalance according to the theory. The construct is not reliable enough (α = .49) and can be increased when question twelve it deleted to an α of .60. However, when looking at the component plot in Figure 12, questions 10 and 12 are less clustered with question 11, since question 7 is deleted. Two new clusters are identified: 3.1 and 3.2 (visualised in red in Figure 12).
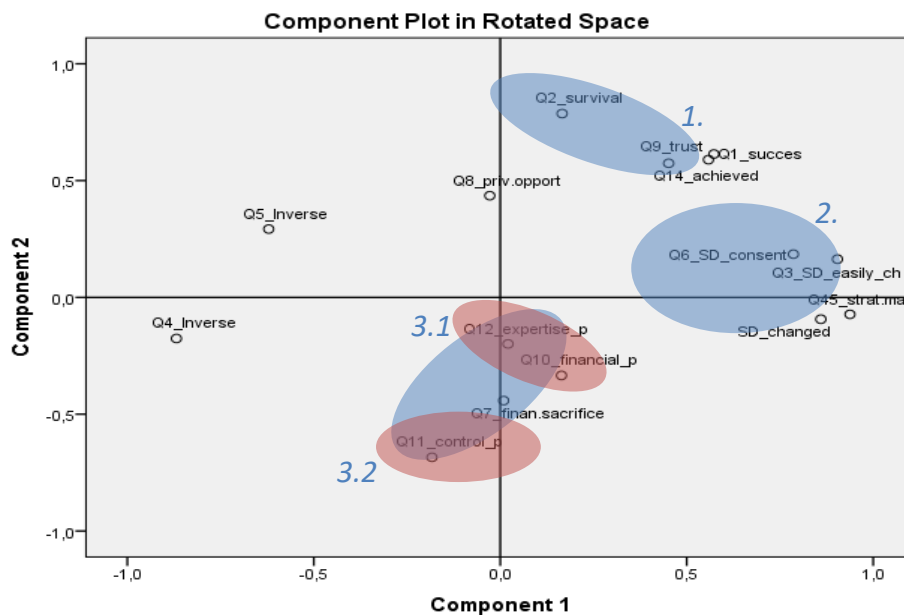
Figure 12 - Component plot 2.

Because no sufficient reliability levels may be achieved for either sub-cluster, power imbalance will be separated into expertise, financial, and control power. These questions will be measured independent (single-item construct) and therefore no specific construct will be made for power imbalance.

The component plot did not identify a cluster which is related to the questions tapping the trust construct. According to the theory and survey, the questions 7, 8, and 9 should measure trust. However, when the reliability is calculated, it shows a negative Cronbach's α of -.24. This probably explains the fact why the component plot did not mark a cluster for trust, as the questions are not consistently measuring the construct of trust.

To measure trust, the questions 7, 8, and 9 are assessed with the JV performance construct. According to the theory, trust is positively related to the performance of alliances (Gulati & Singh, 1998; Kale et al., 2000), and therefore the question(s) of trust should be highly correlated (positively) with JV performance. Question 9 has a high significant and positive correlation with JV performance *(r = .68), w*hile question 7 and 8 have low correlation with JV performance (*r = -.22 and r = .21*). Hence, question 9 will be the only variable measuring the construct trust, because it is highly correlated with JV performance and no combination(s) of questions tapping the construct trust are reliable enough.

The negative correlation of question 7 with JV performance may be explained with the theory Schoorman et al. (2007). While question 7 measures the benevolence according to the ABI-framework it is expected that it will be positively related with JV performance, however it is negatively related. Schoorman et al. argue that organisations prefer to focus on their own (financial) interests rather of the other organisation and therefore do not act benevolent. By which they argue that benevolence is not an important factor in interorganisational trust

3.7   CONCLUSION

This chapter focused on answering the second central question: *"How can the relationship between power imbalance, opportunistic behaviour, trust, and JV performance be observed within asymmetric JVs established in the last ten years?"*. To study this relationship, data was required in order to accept or reject the hypotheses. This data was acquired by combining the SDC Platinum and Orbis database to identify asymmetric JVs which have been established worldwide in the last ten years. From these asymmetric JVs, only the JVs operating in the manufacturing division were contacted by e-mail to complete a survey. These contact details were determined by doing internet searches on the respective JV name to look for news articles citing contact information. The survey contained thirteen closed questions and one open questions to reduce the time required to complete the survey. The questions tap the following variables: JV performance, goal congruence, power imbalance, and trust. In total 77 complete surveys were sent back of which 57 cases provide useable data to test the hypotheses for asymmetric JVs. These cases are controlled for outliers and the constructs were checked by doing reliability analyses. Now the data is obtained, the hypotheses can be analysed with statistics in the next chapter.

4.1 SUMMARY

The objective of this research is to assess how opportunistic behaviour and trust affect the performance of asymmetric JVs. This was done by conducting a quantitative research, for which the data was retrieved from multiple databases and from a cross-sectional survey. The hypotheses were found to be mostly valid. Financial and expertise power are positively related with control power, which in turn is negatively related with goal congruence. Next, goal congruence positively affects trust and JV performance. Larger organisations are more likely to have invested the most financial resources to the JV by which it accumulated the majority of control power to steer the strategic direction. Whenever the strategic direction was changed within the asymmetric JV, then the degree of JV performance, goal congruence, and trust significantly decreased. Another t-test showed that when there is a balance in expertise power, then this would result in higher JV performance, less strategic direction changes, and higher goal congruence. These results suggest that the theory surrounding asymmetric JVs is valid for this sample.

4.2 INTRODUCTION

The previous chapters addressed how the variables are related with each other and how these variables are measured. In this chapter the following step is made to test whether these hypotheses are valid or not. This is done by conducting statistical analyses with IBM's software package SPSS 23.0. This chapter will answer the third central question: *"How do the variables power imbalance, opportunistic behaviour, and trust relate to each other?".* This is done by firstly discussing the descriptive statistics of the data after which the correlations among the variables are discussed. Secondly, several t-tests are conducted to see whether there are significant differences between different groups of asymmetric JVs. Lastly, multiple regression analyses are conducted to test the conceptual model and to predict the outcome of JV performance and control power.

4.3 UNI- AND BIVARIATE STATISTICS

4.3.1 UNIVARIATE ANALYSIS

This chapter will focus on the univariate descriptive statistics of the data at hand (mean, standard error (SE), and standard deviation (SD)). These statistics are listed on the left of Table 9. See Annex VI for the full table.

Table 9 – Correlation matrix. [a]

	Variables	Mean	SE [b]	SD [c]	1	2	3	4	5	6	7	8	9
1	Goal Congruence	5.85	0.23	1.72	1.00								
2	Financial power	2.04	0.09	0.71	.10	1.00							
3	Control power	2.02	0.08	0.64	-.31[*]	.43[**]	1.00						
4	Expertise power	2.04	0.09	0.71	-.06	.03	.28[*]	1.00					
5	JV Performance	4.85	0.26	1.94	.41[**]	.02	-.42[**]	-.11	1.00				
6	Turnover ratio	307.89	98.3	742.16	-.20	.25[*]	.01	-.16	-.14	1.00			
7	Trust	5.04	0.23	1.72	.59[**]	.04	.39*	.10	.68**	-.09	1.00		
8	JV age	222.7	15.01	113.35	-.25*	.17	.04	.01	.11	.01	-.12	1.00	
9	SD changed [d]	1.56	0.07	0.50	.77**	.04	-.14	.04	.35**	-.21	.37**	-.15	1.00

[a] n = 57. [b] **Standard Error.** [c] **Standard Deviation.** [d] **Coding: 1 = strategic direction has changed, 2 = strategic direction has not changed.**
**** p < .01; * p < .05; non-significant p > .05, (one-tailed test).**

The following part will review the univariate descriptive statistics of each variable (mean, SE, and SD) and will discuss any abnormal observed values. When the SE is relative small when compared to the mean, then one could assume that most of the cases are similar to the population and therefore reflect an accurate reflection (Field, 2009). This is the case for all the variables expect for the turnover ratio variable. The SD reviews the spread of the data around the mean, a low SD indicates that most of the cases are clustered around the mean and a high SD vice versa. The range of this spread is calculated by subtracting the SD from the mean (lowest value) and adding the SD to the mean (highest value).

1. *Goal congruence* has a mean of 5.85 and a relative small SE of 0.23. When the spread is calculated, most of the data lies between 4.13 (mean (5.85) – SD (1.72)) and 7.00 (mean (5.85) + SD (1.72)). The higher end of the spread cannot exceed 7.00 since this variable is measured on a seven-point Likert scale. Because the SD is limited by the range in which the variable was measured, skewness to the lower values is expected to influence the spread. This spread suggests that most of the JVs have experienced positive goal congruence, but is influenced by JVs with low goal congruence (due to the skewness of the spread).

2. *Financial power* has a mean of 2.04, has a relative small SE of 0.09, and was measured on a three point scale. The spread of the cases (SD = 0.71): 1.33 – 2.75, indicates that organisations did invest varying amounts of financial resources into the JV. The lower end of the spread (1.33) indicates that organisations invested the minority of financial resources to the JV while the higher end of the spread (2.75) indicates that organisations have invested the majority. Scores around the value of 2.00 (mean (2.04)) indicate that organisations have invested an equal amount of financial resources like its partner in the JV.

3. *Control power* has a mean of 2.02, has a relative small SE of 0.08, and was measured on a three point scale. The spread of the cases (SD = 0.64): 1.38 – 2.66, indicates that organisations did accumulate varying amounts of control power in the JV. Like financial power; organisations did accumulate the lowest degree of control power when the value nears 1.00, an equal degree of control power around a value of 2.00, and the highest degree of control power when the value nears 3.00.

4. *Expertise power* has a mean of 2.04, has a relative small SE of 0.09, and was measured on a three point scale. The spread of the cases (SD = 0.71): 1.33 – 2.75, indicates that organisations did accumulate varying amounts of expertise power in the JV. The spread can be interpreted like the spread of financial power (similar spread).

5. *JV Performance* has a mean of 4.85 and a relative small SE of 0.26. Like goal congruence, JV performance was measured on a seven-point Likert scale (1.00 – 7.00). The spread of the cases (SD = 1.94); 2.91 – 6.79, indicates that the JVs in the sample have experienced varying performances with JVs achieving very low performance (1.94) and JVs achieving high performance (6.79). From Annex VI it is learned that on average 52.3% of the JV's goals are achieved in the sample. This corresponds with the varying achievement of performances, as JV performance is measured in the degree of goal fulfilment.

6. *Turnover ratio* has a mean of 307.9 and an SE of 98.3. This SE is not small when compared to the mean and thus may not reflect the population accurate. However, the JVs were selected by simple random sampling by which each JV in the population had the same chance of being selected (Sekaran & Bougie, 2010), which suggests that the selection is not biased and thus reflects the population.
Remarkably, the SD (742.2) of the turnover ratio variable is much greater than the mean (307.9). This suggests that most of the data is spread out and lies between the values -434.3 and 1,050.1. However, the turnover ratio is not allowed to take negative values and thus the data is skewed. The skewness of the variables was already calculated before in chapter 3, which indicated that the data for the turnover ratio variable was positively skewed and positively kurtotic (Table 7). This implies that most of the values are between the zero and the mean rather than between the mean and higher values. This suggests that the

sample contains mostly JVs that have a turnover ratio lower than the mean and contains a small amount of JVs with a high turnover ratio.

7. _Trust_ was also measured on a seven-point Likert scale and has a mean of 5.04 and relative small SE of 0.23. The spread of the cases (SD = 1.72); 3.32 – 6.76, indicates that most of the organisations somewhat trusted their partner in the JV (scores above 4.00), while a small amount of organisations' distrust outweighed the trust in the other partner (scores below 4.00).

8. _JV age_ is measured in weeks and has a mean of 222.7 and a small SE of 15.01. The spread of the cases (SD = 113.35); 109.35 – 336.05, indicates that the majority of JVs in the sample are older than 109 weeks and younger than 336 weeks. The fact that the majority of the JVs are at least 109 weeks (over two years) is important, since this ensures that the JVs are not in their start-up phase. An JV in their start-up phase could bias the results, as these JVs have a lower chance that their strategic direction was changed (Kale et al., 2000).
   From Annex IV it can be learned that the oldest JV in the sample was established in January 2007, while the youngest JV was established in August 2016. This represents the research's timeframe in which JVs are studied that were established during the period of 2007 until 2016.

9. _Strategic direction (SD) changed_ has a mean of 1.56 and an SE of 0.07. This variable was measured on a two-point scale; an value of 1 indicates that the SD was changed, while an value of 2 indicates that the SD was not changed during the JV's lifetime. The spread of the cases (SD = 0.50); 1.06 – 2.00, suggests that the JVs in the sample could have had a strategic direction change or did not have any.

4.3.2 BIVARIATE ANALYSIS

To determine the correlations between the variables a bivariate analysis is made in SPSS. The degree of correlation is represented with the Pearson correlation coefficient (r). An one-tailed test is made, since all the hypotheses are directional, e.g. it is expected that variable X is positively related with variable Y. The correlations together with their probability level (Table 9) are summarised in the conceptual model below (Figure 13).
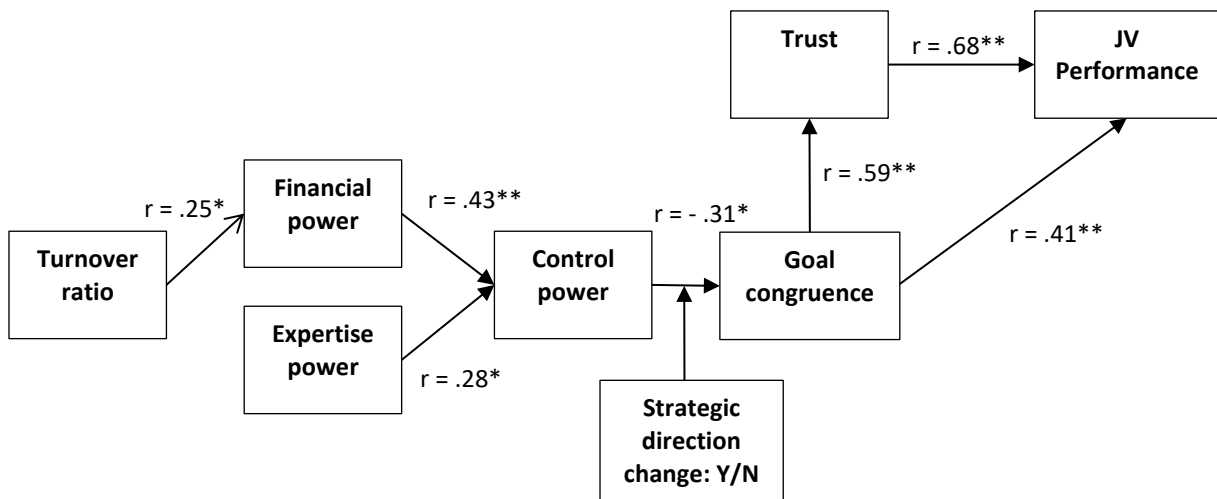
Figure 13 – Conceptual model including the correlations.

** p < .01; * p < .05; non-significant p > .05.

The conceptual model shows that all relationships between the variables are significant on either the 5% or 1% confidence level. The following significant relationships are identified:

- There is a significant relationship between the turnover ratio and the amount of financial power accumulated by one partner, r = .25, p < .05 (one-tailed).
  - The more asymmetric an JV becomes (turnover ratio increases), the more financial power accumulated by one of the partners.
- Control power is significantly correlated with financial power, r = .43, p < .01 and expertise power, r = .28, p < .05 (both one-tailed).
  - Therefore, the hypotheses: 3.3 – *"The degree of financial resources invested is positively related with control power"* and 3.4 – *"The degree of expertise in the JV is positively related with control power"* are accepted.
- There is a significant relationship between the control power and the goal congruence, r = -.31, p < .05 (one-tailed).
  - This relationship belongs to hypotheses 3.1 and 3.2, however the relationship is moderated and will be reviewed below.
- There is a significant relationship between goal congruence and trust, r = .59, p < .01.
  - Therefore, the hypothesis 2.2 – *"Goal congruence is positively related with trust"* is accepted.
- JV Performance is significantly correlated with trust, r = ,68, and goal congruence, r = .41. (both p < .01 and one-tailed)
  - Therefore, the hypotheses: 2.1 – *"Goal congruence is positively related with JV performance"* and 4.1 – *"Trust is positively related with JV performance"* are accepted.

MODERATOR

A bivariate analysis is only capable of testing relationships between two variables, and therefore it is not able to validate the moderator and mediator which can be seen in the conceptual model. However, the moderator may be reviewed by splitting the correlation table into two groups; in which one group had no strategic direction changed and one did (annex VII). This results into the following:

- There is a significant relationship between the control power and the goal congruence when the strategic direction has changed, r = -.45, p < .05 (one-tailed).
  - Therefore, the hypothesis 3.1 – *"Control power is negatively related to goal congruence when the strategic direction has changed"* is partially accepted. The moderator still has to be accepted within a multiple regression analysis.

However, the relationship between control power and goal congruence cannot be tested when the strategic direction has not been changed in an JV, since all the values for goal congruence are constant (this is explained in the previous chapter). Therefore hypothesis 3.2: *"Control power is not related with goal congruence when the strategic direction has not changed."* cannot be tested, and therefore should be rejected.

To test the significance of the moderator and mediating effect, multivariate analyses are required, which will be conducted in Chapter 4.6.

Instead of looking at the degree of the correlations between the variables, this chapter will focus on the mean differences between two or more groups. These groups may relate to the JVs with or without strategic direction change and/or JVs with or without power imbalances. To statistically measure whether these groups are different from each other, multiple independent t-tests are conducted in SPSS and are summarised below. The SPSS output of all the t-tests are put in Annex VIII.

4.4.1   T-TEST – POWER AND ASYMMETRY

The first pair of t-tests will compare the differences in power and asymmetry. To answer hypotheses 1.1 and 3.5, the research perspective has to be altered. These hypotheses cannot be answered with the SPSS model used for the main analyses, because these hypotheses require the research perspective to shift to either the larger or smaller organisation only. The original subjects used in the SPSS model are from both perspectives; smaller and larger organisations. This data should be translated to the perspective of the larger sized organisations alone. To do this the answers from the smaller organisations to the questions assessing power (financial, expertise, and control power) are inversed; e.g. majority financial power invested by the larger partner becomes minority financial power invested by the smaller partner.

T-TEST - HYPOTHESIS 1.1

This part will answer hypothesis 1.1: *"Larger sized organisations in asymmetric JVs will invest the most financial resources more frequently than the smaller sized organisations".* This hypothesis tests in general whether large organisations have truly invested more than smaller organisations in asymmetric JVs. From the 57 subjects, large organisations did invest the majority amount of financial resources in 22 cases, invested an equal amount in 29 cases and invested the minority amount in 6 cases. From these numbers it is clear that the larger organisation invests almost four times as frequent the majority amount of financial resources (22 cases, 38.60%) than smaller organisations (6 cases, 10.5%).

To justify this finding with statistics, a t-test is conducted between two groups: smaller and larger organisations. The number of cases is doubled in this t-test, because if it is known that the larger partner invested the most resources, then it assumed that the smaller partner invested the minority of resources. The t-test did find a significant difference between the means of financial power between smaller and larger sized organisations.

- *On average, larger organisations have invested more financial resources into the asymmetric JV than the smaller organisations; $t(112) = 4.26$, $p = .001$ (2-tailed)*

Besides financial power, expertise power and control power were also measured within this study. The t-tests did not find any significant difference between the means of expertise power of smaller and larger organisations. Which suggests that neither of the groups (smaller or larger organisations) have contributed the minority or majority of expertise to the JV. And therefore both groups have contributed, on average, an equal amount of expertise power to the JV. The t-tests did, however, find a significant mean difference in control power between the partners of an asymmetric JV.

- *On average, a larger organisation has more control over the strategic direction within the asymmetric JV than the smaller organisation; $t(112) = -2.09$, $p = .039$ (2-tailed)*

These t-tests show that the larger organisations have invested the majority of financial resources and accumulated the majority of control power in the JV. While expertise power is equally distributed between the smaller and larger partner.

To answer hypothesis 3.5: "*If JVs get more asymmetric, then the larger organisations will invest the majority of financial resources more frequently.*", the perspective of the large organisation is used. The t-tests below compare the mean of the turnover ratio with the following three groups: (1) large organisations which invest the minority, (2) an equal, and (3) the majority amount of financial resources to the JV.
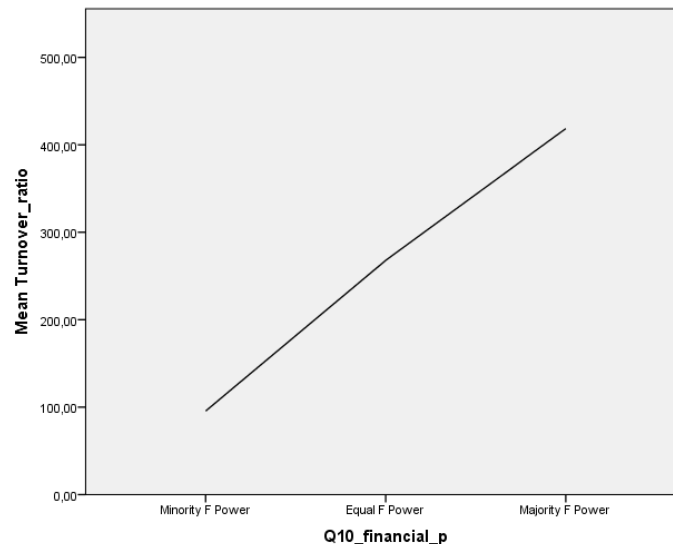
Figure 14 - Mean turnover ratio and financial power accumulated by the larger organisation.

The t-tests show an increasing trend in which larger organisations are more likely to invest the least amount of resources at lower turnover ratios (mean of 95.57). Larger organisations are more likely to invest an equal amount when the turnover ratio increases to 267.85 and will invest the majority when it further increases to 418.58.

This trend, visualised in Figure 14, shows that the more asymmetric an JV get, the more likely it is that the larger organisations will invest the majority of resources. By which the larger partner accumulates the most financial power. Although it may seem like that the hypothesis is accepted, it should be rejected since the mean differences are non-significant (p > .05).

4.4.2   T-TEST – STRATEGIC DIRECTION CHANGE

A strategic direction change within the JV may have happened in favour of one partner or in favour of both partners. A t-test is made to test whether JVs with strategic direction changes perform better or worse than JVs without strategic direction change. Two groups are distinguished; one group with JVs including a changed strategic direction (SD) (N = 25), and one without (N = 32). To identify differences between these groups, an independent samples t-test is conducted. Again, the output for this t-test and for the following t-tests are put in Annex VIII. The JVs included in both groups are on average highly asymmetric (turnover ratio > 160), hence the partners differ hugely in organisational size.

The t-test did not find any significant mean differences between the means of financial power, control power, expertise power, and turnover ratio. However, the effect of a strategic direction change does result in significant mean differences in the variables: goal congruence, JV performance, and trust:

▪ *On average, partners in JVs without strategic direction change have higher goal congruence than JVs with strategic direction change; t(55) = -8.83, p = .001 (2-tailed)*

- *On average, JVs without strategic direction change have higher performance than JVs with strategic direction change; t(55) = -2.67, p = .01 (2-tailed)*

- *On average, partners in JVs without strategic direction change have higher trust levels than JVs with strategic direction change; t(55) = -2.96, p = .005 (2-tailed)*

These results indicate that whenever the strategic direction has changed during the lifetime of the JV, then this will result in lower JV performance, less goal congruence, and lower trust. These results when compared with the conceptual model, makes it clear that when goal congruence is limited, that trust and JV performance will be negatively affected.

4.4.3   T-TEST – SYMMETRIC AND ASYMMETRIC JVS

This research collected data to analyse asymmetric JVs, however the survey also gathered data of fifteen symmetric JVs. To compare the means of symmetric and asymmetric JV, a t-test is conducted. One should keep in mind, that the group of symmetric JVs is too small to identify large effects, and thus lacks statistical power (see chapter about required sample size). However, the t-test is still conducted to see whether there are mean differences between symmetric and asymmetric JVs. If there are none, then separating the literature into symmetric and asymmetric JVs becomes less suitable since the two are not different from each other.

The analysed symmetric and asymmetric JVs are roughly the same age (4 - 5 years). The t-test resulted in non-significant mean differences except for turnover ratio, however this was expected due to the lack of statistical power. Nonetheless, some differences were seen between symmetric and asymmetric JVs. Symmetric JVs have less opportunism, higher JV performance, and lower trust. These differences are as expected, since the partners in symmetric JVs have more likely a balanced power balance by which high goal congruence may be achieved. This promotes cooperative behaviour and therefore also increases JV performance. However, due to the similar organisation sizes the symmetric partners may become suspicious of each other for proprietary knowledge appropriation, which is not reviewed in this study.

4.4.4   T-TEST - POWER BALANCE AND IMBALANCE

This t-test is conducted to see whether JVs with either a financial, control, or expertise power imbalance has significant mean differences with JVs with a balance in the respective power type. This is expected as power imbalances could incentivise opportunistic behaviour.

The t-test did not find any significant mean difference between JVs with an imbalance and JV with a balance in financial power or control power. However, when looking at the mean differences, an imbalance in control power or financial power does decrease the JV performance. This finding could be made significant with increased statistical power, which will be discussed in the limitations section in the next chapter. An expertise power imbalance did gave significant major mean differences with a group with a balanced expertise power.

- *On average, an asymmetric JV with a balance in expertise power have higher JV performance than asymmetric JVs with an imbalance in expertise power; t(55) = -2.47, p = .017 (2-tailed)*

- *On average, an asymmetric JV with a balance in expertise power have less strategic direction changes than asymmetric JVs with an imbalance in expertise power; t(55) = -3.27, p = .002 (2-tailed)*

- *On average, an asymmetric JV with a balance in expertise power have higher goal congruence than asymmetric JVs with an imbalance in expertise power; t(55) = -2.85, p = .006 (2-tailed)*

An almost significant mean difference was found for trust (p = .065). This difference is listed, although not significant, since the significance may increase when the sample size increases, by which the sample is better at identifying smaller effects. Therefore, this almost significant mean difference will be discussed in the following chapter: *Chapter 5 – Discussion.*

- *On average, an asymmetric JV with a balance in expertise power have higher trust than asymmetric JVs with an imbalance in expertise power; t(55) = -1.88, p = .065 (2-tailed)*

This t-test showed that there are no significant mean differences between JVs with a power imbalance and JVs with a power balance in financial power and control power. However, a power imbalance which is based upon expertise power does result into lower JV performance, more strategic direction changes, less goal congruence, and less trust when compared with JV with a balances expertise power.

4.5   CHECK CONCEPTUAL MODEL

The conceptual model is based on theory describing the relationships among the variables. To make sure that this model is consistent with the data, a path analysis is made. A path analysis is used to justify the conceptual model which is based on theory and assumptions with statistics (Pedhazur, 1997). The first step in a path analysis is to separate the exogenous and endogenous variables. An exogenous variable is influenced by variables not included within the conceptual model. An endogenous variable is influenced by exogenous and outside variables. The model includes two exogenous variables: turnover ratio and expertise power. The remaining variables are modelled as endogenous variables in the figure below. The model includes more relationships than the original conceptual model, as the first step requires a just-identified model. Which is a model that includes all the relationships which the theorised conceptual model assumed to be zero (Kenny, 2011).
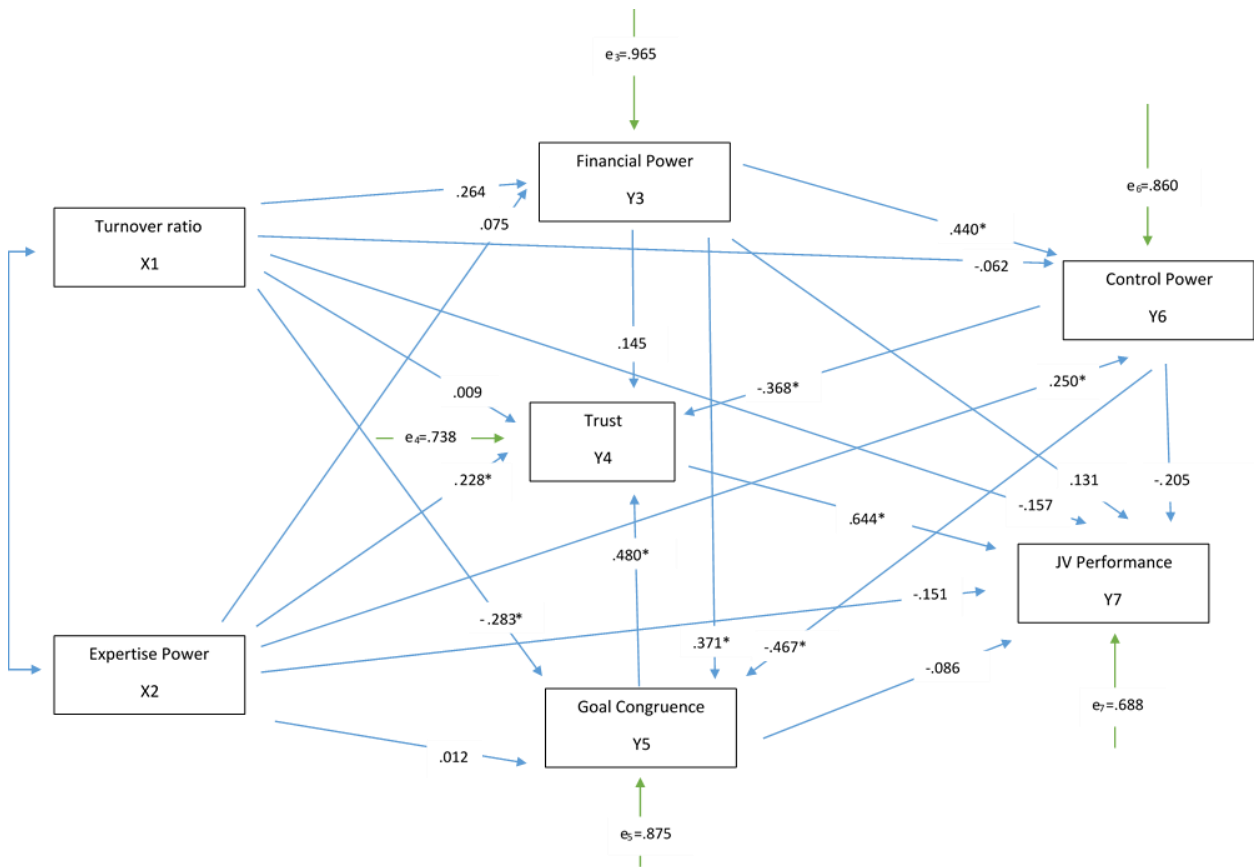
Figure 15 - Just identified model. * p < .05; non-significant p > .05.

The relation X1X2 is left unanalysed, because it involves two exogenous variables which are not expected to influence each other. Because not all variance of the endogenous variables is explained by the included variables, residual variables (e_3 – e_7) are included. For example when the variation of a variable is explained by 40% of the included variables, then 60% will be explained by the (residual) variables outside the model. Equation 3 is used to calculate the residual variables (e).

$$e = \sqrt{1 - R^2} \qquad (3)$$

The R^2 is the R square from the *model summary table* of a regression analysis which explains the percentage of explained variance in the predicted variable. Another value retrieved from the regression analysis are the standardised coefficients from the *coefficients table*. These coefficients are the standardised regression coefficients (β) which are required to determine the path coefficients in the figure below. An β indicates the strength of a relationship between the independent and dependent variable (Field, 2009). The multiple regression analyses' output can be found in Annex IX.

The next step in the path analysis is to delete all the non-significant relationships in the just identified model (Kenny, 2011). These relationships are not marked with an asterisk (*) which would otherwise imply significance ($p < {,}05$). Table 10 shows all the to be deleted non-significant relationships from the just identified model.

These relationships should also be assessed on potential mediation effects. This is argued because the relationship may be significant in a bivariate analysis (correlation), while it becomes non-significant in a multiple regression analysis. Therefore, each deleted path with a significant correlation in a bivariate analysis are reviewed for a mediation effect. A mediation effect exists when β = 0 or $0{,}00 < β < r$. The β is calculated in a multiple regression analysis in which a simple mediation effect is analysed (dependent, independent, and mediating variable) (Garbin & Hoffman, 2017).

Table 10 – Deleted paths.[a]

Number	Path	β	r	β from simple mediation	Mediation
1	X1Y3	0.264	.252*	0.264	No
2	X1Y7	-0.157	-.142		
3	X1Y6	-0.062	.009		
4	X1Y4	0.009	-.088		
5	X2Y4	0.212	.102		
6	X2Y7	-0.151	-.107		
7	X2Y3	0.075	.033		
8	X2Y5	0.012	-.059		
9	Y3Y4	0.145	.043		
10	Y3Y7	0.131	.017		
11	Y6Y7	-0.180	.415**	-0.320 and -0.179	No
12	Y5Y7	-0.086	.410**	0.015	Yes

[a] n 57. ** $p < {,}01$; * $p < {,}05$; non-significant $p > {,}05$.

The X1Y3 and Y6Y7 relationships do not act as a mediating affect, since their value of the standardised coefficient (β) does not lie between zero and the value of the correlation coefficient (r) or is equal to zero. The Y5Y7 relationship, however, is a mediating effect and is therefore not deleted from the model.

In total eleven non-significant paths are deleted from the model. Figure 16 shows the trimmed model in which the eleven paths are deleted.
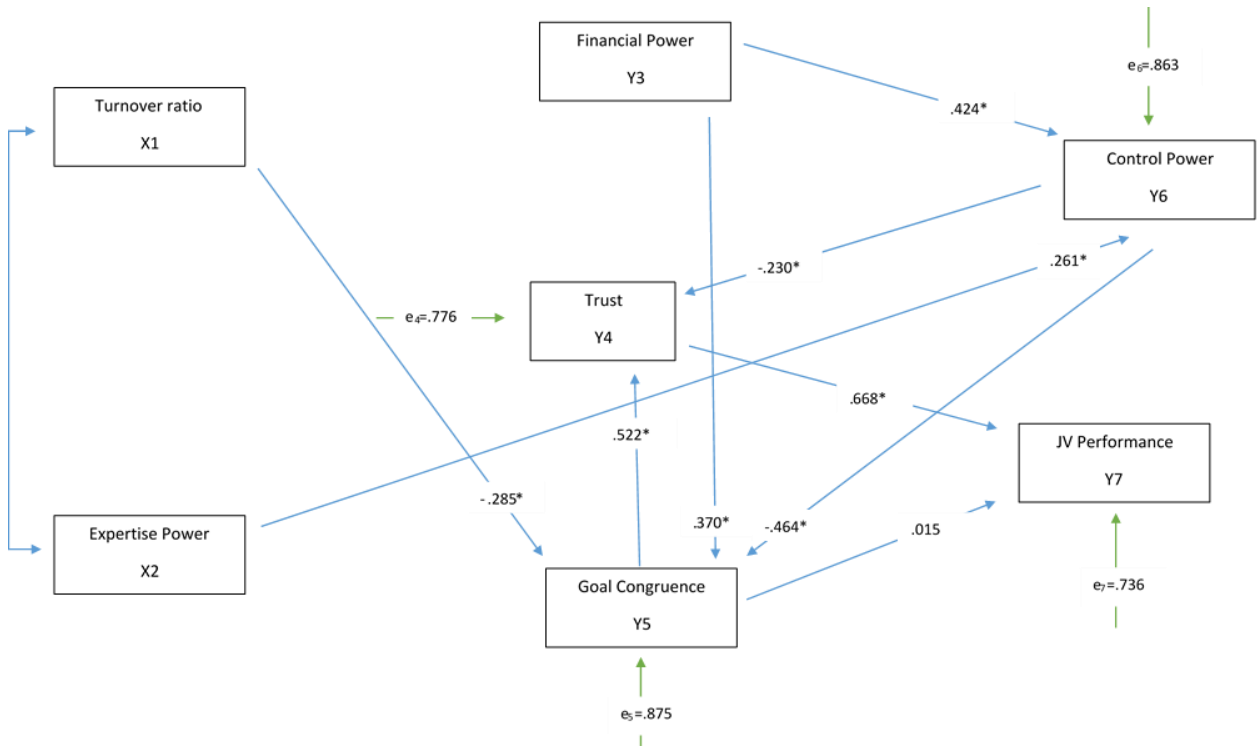
Figure 16 – Trimmed model. * p < .05; non-significant p > .05.

In order to compare the trimmed model with the theorised conceptual model, the trimmed model is rearranged into the model below.
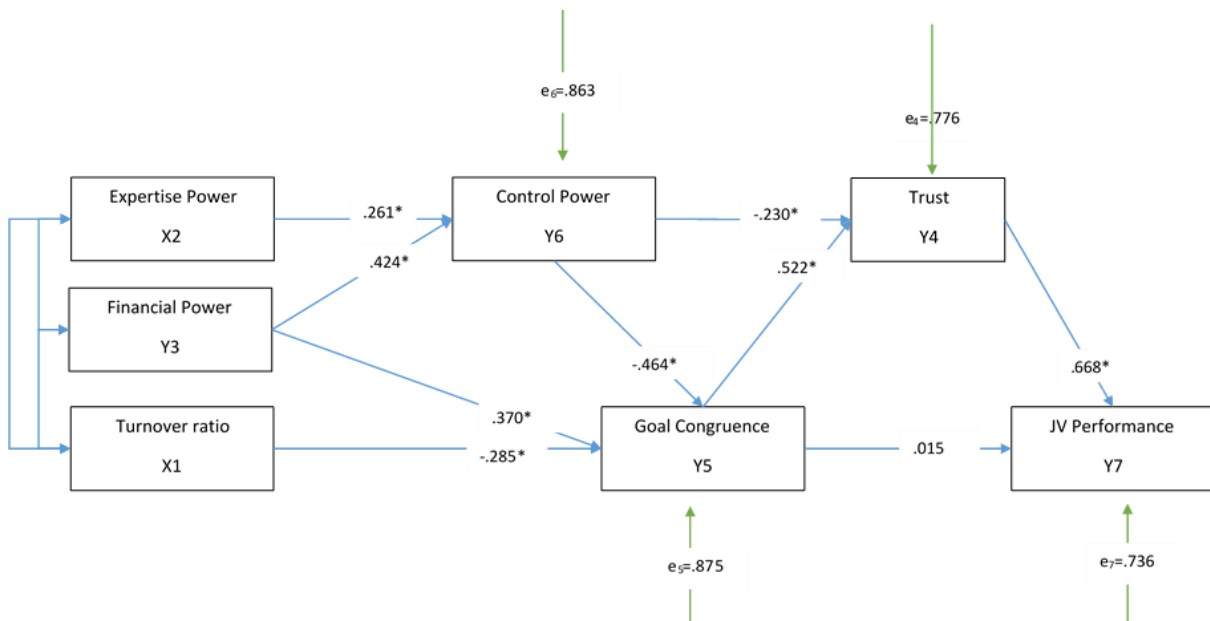
Figure 17 – Trimmed model (rearranged). * p < .05; non-significant p > .05.

The differences between the trimmed model and the theorised conceptual model are: (1) control power is connected with trust (path Y6Y4), (2) financial power is connected with goal congruence (path Y3Y5), (3) turnover ratio is connected with goal congruence (path X1Y5), and (4) turnover ratio lost its relation with financial power (path X1Y3).

The next step in the path analysis is to justify that the trimmed model fits the data as well as the just identified model. The following equations are used to calculate the fit of a model. In which the residual variables (e) of each respective model are the input.

Fit of full model $\qquad 1 - \pi(e^2) = 1 - 0.965^2 * 0.738^2 * 0.875^2 * 0.860^2 * 0.688^2 = 0.864$

Fit for reduced model $\qquad 1 - \pi(e^2) = 1 - 0.776^2 * 0.875^2 * 0.863^2 * 0.736^2 = 0.814$

The fit of the full model has a value of 0.86 while the fit of the reduced model has a value of 0.81. To calculate the relative fit of the reduced model to the full model (Q), the next equation is used.

$$Q = \frac{1 - fit\ of\ full\ model}{1 - fit\ of\ reduced\ model} = \frac{1 - 0,864}{1 - 0,814} = 0.731$$

The relative fit of the reduced model to the full model is 0.73. To conclude that the reduced model fits the data as well as the full model, the model-fit difference has to be lower than the critical chi-square. The following equation is used to calculate the model-fit difference (W), in which N is the sample size and d represents the total number of paths deleted from the full model.

$$W = -(N - d) * log_e(Q) = -(57 - 11) * log_e(0.731) = 14.414$$

This value (W = 14.41) has to be compared with the critical chi square value (χ^2_{crit}). To calculate the χ^2_{crit} the degrees of freedom has to be calculated. The degrees of freedom is represented by the amount of paths deleted from the model, in which this case is 11 paths. At a confidence level of 95% and 11 degrees of freedom, the χ^2_{crit} value is 19.7 (StatTrek, 2017). The statistic of the model-fit difference is smaller than the critical chi square value (W < χ^2_{crit}), and therefore the trimmed model does fit the data as well as the full model. Hence, none paths are deleted from the model which contribute to the model (Garbin & Hoffman, 2017).

The trimmed model (Figure 18) show the Pearson's correlations (r) together with the probabilities between the variables. The figure shows that the paths Y3Y5 and X1Y5 are not significant (made orange in the figure). A choice is made to delete these paths. To calculate whether the trimmed model does as well fit the data as the full model, the residual have to be calculated again (see Annex IX). Again the trimmed model fits the data as well as the full model (paths deleted = 13, W= 21.18, χ^2_{crit} = 22.4).
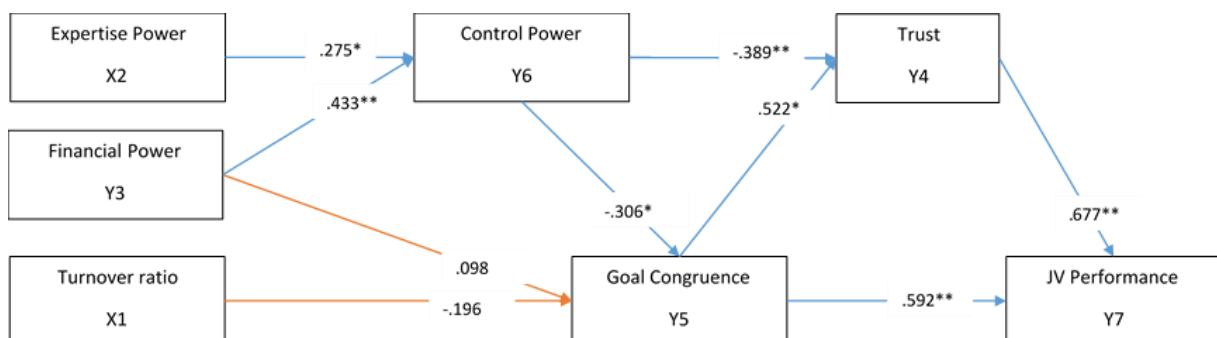
Figure 18 – Trimmed model with correlations. ** p < .01; * p < .05; non-significant p > .05.

The trimmed model (the blue lines in the figure 18) does fit the data as well as the full model. When compared with the theorised model, two differences may be observed: (1) control power is connected with trust (path Y6Y4), and (2) turnover ratio lost its relation with financial power (path X1Y3). The fact that the latter relationship has been lost is expected since this relationship requires the research perspective to change to either the larger or smaller organisation in the JV.

Because the statistical model greatly aligns with the theorised model, it is assumed that the conceptual model fits well enough with the data. To check whether the extra mediator (goal congruence) exists, the following part, multiple regression analyses, will calculate the prevalent mediating effect.

4.6   MULTIPLE REGRESSION ANALYSES

The prior chapter focused on the relationships between two variables based on linear relationships among its means. However, relationships may be better explained by linear relationships other than basing it on the means (Field, 2009). These analyses are called regression analyses, and allows the researcher to predict the outcome of a dependent variable based on one or multiple independent variables. Multiple regression analyses are conducted to predict the variables JV performance and control power and to check the validity of the mediators and moderator in the theorised model.

One note of awareness should be taken into account when conducting multiple regression analyses, which is the existence of multicollinearity. Multicollinearity exists when there is a strong correlation between the variables which are used to predict the outcome of another variable. Multicollinearity makes it hard to assess the importance of each variable which is used as a predictor. Multicollinearity is not expected to be limiting the regression analyses as none of the correlations in the correlation matrix are above .80 which suggest strong correlations (Field, 2009). Despite this fact, multicollinearity is still controlled for by assessing the "Variance Inflation Factors, (VIF)" which should be below 10.0.

4.6.1   JV PERFORMANCE

A regression analysis is conducted to predict the outcome of the dependent variable: JV performance. According to the conceptual model, JV performance can be predicted by trust and goal congruence. Since the JV performance is predicted by more than one variable, a multiple regression analysis is required. The independent variables are entered in a blockwise entry, which means that variables known to predict the outcome are entered first into the model. Goal congruence is expected to influence the JV performance, while trust is known to predict the JV performance. Hence, model 1 contains trust predicting JV performance and model 2 contains trust and goal congruence predicting the performance. Also the bivariate analysis in the prior chapter showed that the relationship between JV performance is bigger with trust than with goal congruence.

The main findings of the multiple regression analysis will be assessed first after which the model's generalisability will be assessed. The output of the analyses is shown in Annex X.

The initial regression analysis failed to predict the outcome of the dependent variable, since extreme cases were influencing the regression model. These extreme cases are assessed in Annex X.II. To summarise this Annex, the following statistics were reviewed to control for extreme cases: standardised residuals, Cook's Distance, Centred Leverage Value, Mahalanobis distance, DFBeta, and Covariance ratio (Field, 2009). Four extreme cases were identified which violated the centred Leverage value and covariance ratio statistic. Consequently, these cases are deleted from the analysis.

After deleting the extreme cases, the regression analysis was able to predict the dependent variable. The output is summarised in Table 11.

Table 11 – Multiple regression results predicting JV performance. [a]

	B	SE B	β
Model 1			
Constant	1.14	0.49	
Trust	0.79	0.09	0.77***
Model 2			
Constant	1.18	0.59	
Trust	0.79	0.11	0.78***
Goal congruence	-0.01	0.11	-0.01

[a] n = 53. R^2 = .59 for model 1, ΔR^2 = .00 for model 2 (p < .001).

*** p < .001; ** p < .01; * p < .05; non-significant p > .05.

When trust is used to predict the performance of JVs, it explains 59% *(R^2 = .59, Table 11)* of the variance in the JV performance. Remarkably, the explained variance stays equal when the goal congruence variable is added to the model *(ΔR^2 = 0, Table 11)*. This could suggest that the two predicting variables are strongly correlated and therefore multicollinearity may be limiting the analysis. However, in both models the VIF values (model 1 = 1.00 and model 2 = 1.53) are below 10.0, hence multicollinearity is not limiting the analysis. This particular effect, the fact that the explained variance of both models is equal and is not limited by multicollinearity, is reviewed in chapter 4.6.2 since this effect indicates a strong mediating effect.

For both models the F-ratios are highly significant *(p < .001)*, however the F-ratio decreases from 73.92 to 36.25 when goal congruence is added to the model. These values are above 1.00, which suggest that the models are able to predict the outcome of JV performance better than using the mean, but model 1 is better to do so.

The regression model is able to formulate a relationship for model 1 as the t-statistics are significant *(p < .05)*, but not for model 2 *(p = .91, β-statistic for goal congruence, Table 11)*.

$$JV\ Performance = 1.14 + 0.79 * Trust$$

When trust increases by one unit, then the JV performance will increase by 0.79 units. This implies that trust and JV performance are positively related with each other and that trust has a major impact on JV performance. Because model 2 was not significant, JV performance cannot be predicted reliable enough by using both the variables trust and goal congruence as predictors.

GENERALISABILITY

The developed equation in the prior chapter is significant within the used sample, however the relationship may also hold true for the whole population when it is generalisable. To generalise the equation, the following assumptions should be met to test whether the sample is biased or not (Field, 2009). Each assumption will be directly tested.

1. *Variable scales;* the variables should be measured at interval level or at categorical level. The included variables use the Likert scale, which is considered to be an interval scale (Sekaran & Bougie, 2009, p. 152). And therefore this assumption is met.
1. *Non-zero variance:* all the independent variables should show variation. Each included variable has a variance greater than zero, therefore this assumption is met (see Annex VI).
2. *No perfect multicollinearity:* The VIF-score of the used coefficients is 1.00 which is below the value of 10 at which point one should consider multicollinearity (Annex X). Therefore no perfect multicollinearity exists.

3. *External variables:* The included variables should not be correlated with other non-included variables. The correlation matrix (Annex VI) shows that other than trust and goal congruence, control power is also correlated with JV performance (r = -.415, p < .001). Hence, this assumption is not met.

4. *Independent errors:* residual terms should be independent when compared between two cases. To check this assumption, a Durbin-Watson test is conducted. The Durbin-Watson value is 2.16 (Annex X.III) which is within the acceptable range of 1 and 3 (Field, 2009).

5. *Linearity;* the reviewed equation should only contain a linear relationship. The developed equation from the regression analysis conforms to this assumption *(y = b x + c)*.

6. *Independence:* all the respondents were unfamiliar to each other and/or did not have contact with each other. This underlines the assumption of independence of the values of the variables.

7. *Homoscedasticity:* the residuals should have the same level for each level of the independent variable. The distribution of dots should look random in Figure 19 which marks homoscedasticity. The dots seem to cluster in the right part of the graph, hence this assumption is not met.

8. *Normally distributed errors:* the difference between the regression model and survey data should be most frequently (close to) zero. This is identified with a normal distribution in Figure 19.
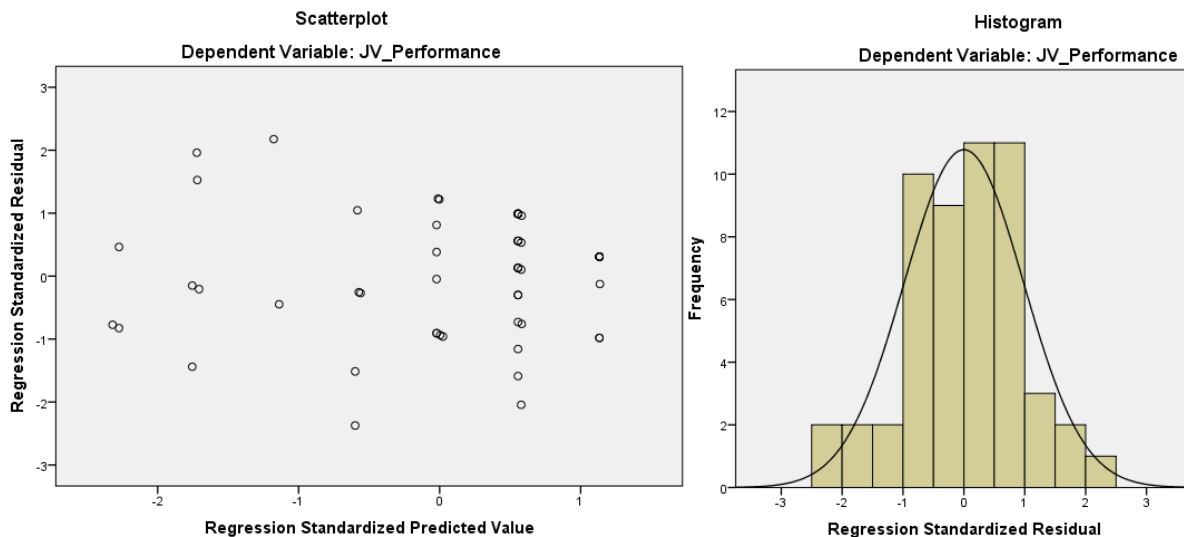
Figure 19 – Scatterplot of residuals against the predicted value (left) and histogram of residuals (right).

The equation to predict the JV performance is not generalisable, since the assumptions three and seven are violated. Therefore the developed equation only holds true within this sample.

4.6.2   MEDIATOR TRUST

The prior chapter showed that the regression analysis to predict JV performance included two models. In which the first model predicts JV performance with only the trust variable, while the second model tries to predict the outcome of JV performance with trust and goal congruence. One should expect that when more variables are used to predict an outcome, that the degree of accuracy determining this outcome increases. However, both models explain the same amount of variance in the JV performance *(R² = .592)*. Although the correlation matrix showed that the variables trust and goal congruence are correlated with JV performance *(r = .677 and r = .410)* and are highly significant *(p < .001)*, one should again expect the total variance to increase when both trust and goal congruence are used to predict JV performance rather than trust alone. Goal congruence becomes non-significant *(p = .908)* when added to the model. There should be no concern for multicollinearity as the VIF scores are below 10.0.

A mediating effect will be examined, because certain characteristics of such a relationship appeared after conducting the regression analysis. The causal relationship between an independent and dependent variable diminishes when a mediating effect is influencing the regression model (Baron & Kenny, 1986). Which is seen in the regression model when the goal congruence variable is added to the model. The causal relationship is sharply reduced and becomes non-significant, which indicates a strong mediator.

Baron and Kenny (1986) argue that certain conditions should be met for perfect mediation to occur. These conditions are stated below together with the corresponding paths visualised in Figure 20.

1. The independent variable is correlated with dependent variable – *path c (total effect)*
2. The independent variable is correlated with the mediator – *path a (indirect effect together with b)*
3. Mediator affects the dependent variable in a regression analysis with the dependent variable – *path b*
4. The mediator makes the independent-dependent variable relationship zero – *path c' (direct effect)*

To calculate the effect of the mediator, the SPSS add-in "PROCESS" written by Andrew F. Hayes (2017) is used. The output of this add-in is given in *Annex XI,* from which the following unstandardised coefficients are retrieved: a = 0.59 (p < .001), b = 0.75 (p < .001), c' = 0.02 (p = .906), and c = 0.46 (p < .001). This output aligns with the unstandardised coefficients from SPSS, and therefore it is assumed that the analysis with the PROCESS add-in is done correctly. An unstandardised coefficient (b) indicates the strength of a relationship, when one variable changes by one unit then the other unit changes by the value of b.
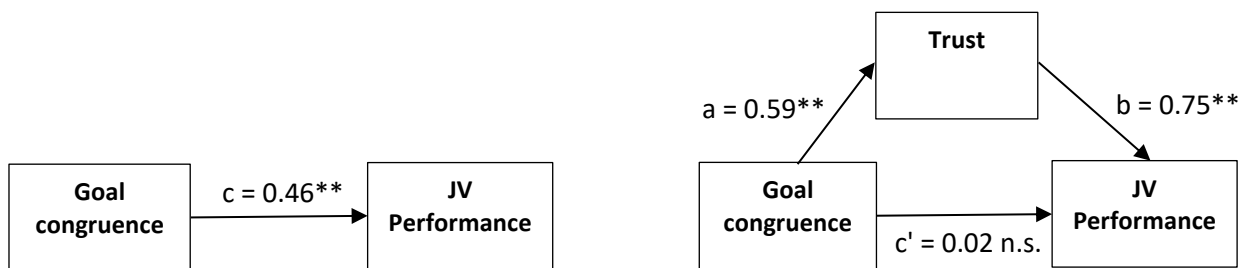
Figure 20 – Causal model and mediated model (left to right). ** p < .001

For the first condition, the independent variable has to be correlated with the dependent variable. Goal congruence is correlated with JV performance *(r = .41 and p < .01, Table 9),* and therefore the first condition is met. Next, goal congruence should be correlated with the mediating variable trust, which is the case. Goal congruence and trust are correlated and is highly significant *(r = .59 and p < .01, Table 9).* The third condition requires the mediating variable to affect the dependent variable. When trust changes by one unit then the outcome (JV performance) changes by 0.75 units (*b = .75 and p < .001, Figure 20)*, hence it may be assumed that the mediating variable affects the dependent variable. The fourth condition states that the mediator reduces the relationship between goal congruence and JV performance to zero. This is not the case as the mediator *(trust)* does not completely mediate the independent-dependent variable *(goal congruence and JV performance)* relationship to zero (c' = 0.02), which indicates partial mediation.

However, complete mediation may be assumed when the ratio between the indirect effect and direct effect is at least 0.80 (Kenny, 2016). The indirect effect is represented by the paths a and b, while the direct effect represents path c with no mediating variable(s). Hence the equation is equal to ab/c.

$$\frac{a*b}{c} > 0.8; \quad \frac{0.59*0.75}{0.46} = 0.962 > 0.80$$

Complete mediation may be assumed since 0.96 > 0.80. This aligns with the fact that trust mediates the relationship between goal congruence and JV performance for 96.4% *(measure: percent mediation (P_M) in Annex XI).* To make sure that this mediation effect if significant, the bootstrapping method is used with the SPSS add-in

PROCESS. For the mediation effect to be significant the bootstrap values' interval should not include a zero. The bootstrap values lie between 0.22 and 0.63 (Annex XI), which indicate that zero does not lie within this interval which indicate that the mediating effect is significant *(p < .05)* (Mackinnon, 2015)*.

This chapter showed that trust completely mediates the relationship of goal congruence and JV performance. This implies that goal congruence does not directly influence the performance of JVs. Also due reverse causal effects at perfect mediation; the outcome may also influences the mediator (Kenny, Kashy, & Bolger, 1998, p. 262). However, the reverse causal effect will not be examined in this research.

4.6.3   MEDIATOR GOAL CONGRUENCE

The path analysis showed that goal congruence mediates the relationship of control power and trust. This chapter will assess to what degree this mediator mediates the relationship. Again the mediating effect will be calculated with the SPSS add-in "PROCESS" (Hayes, 2017), and the output is given in *Annex XI.* From Annex XI the following unstandardised coefficients are retrieved: a = -0.82 (p < .041), b = 0.52 (p < .001), c' = -0.62 (p = .906), and c = 0.46 (p < .001). Please note that the values in Figure 21 are unstandardised coefficients and therefore can exceed 1.00 (total effect (c) = -1.05).
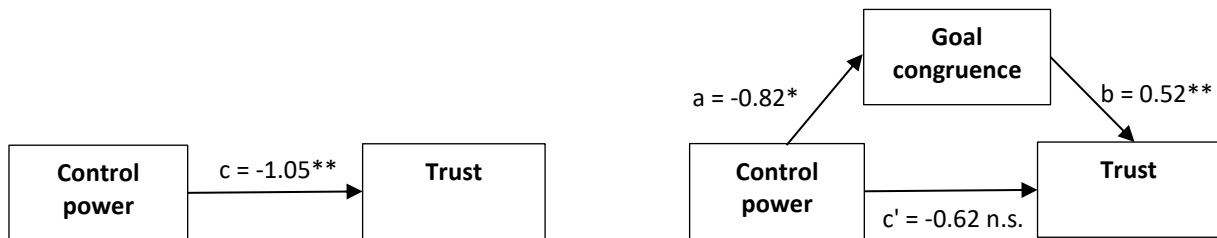
Figure 21 – Causal model and mediated model (left to right). ** p < .001 * p < .01

Again the same conditions apply for a mediating effect to exist (Baron & Kenny, 1986). For the exact formulation of these conditions, please refer back to the prior chapter. The first condition is met, as control power is correlated with trust *(r = .39 and p < .05, Table 9).* The second condition is also met, as control power and goal congruence are correlated *(r = -.31 and p < .05, Table 9).* The third condition requires goal congruence to affect trust, which is the case because when goal congruence changes by one unit than trust changes by 0.52 units *(b = 0.52 and p < 0.001, Figure 20).* The fourth condition states that the mediator reduces the relationship between control power and trust to zero. This is not the case as the mediator *(goal congruence)* does not completely mediate the independent-dependent variable *(control power and trust)* relationship to zero (c' = -0.62*, Figure 20*), which indicates partial mediation.

The mediator partially mediates the relationship for 41% and therefore does not completely mediate the relationship between control power and trust. Also perfect mediation may not be assumed since the ab/c ratio is lower than the threshold of 0.80 (0.69 < 0.80) (Kenny, 2016). The mediation effect is found to be significant. The bootstrap values' interval does not include a zero *(-0.34 and -0.03, Annex XI)*, which signify that the mediation effect is significant *(p < .05)* (Mackinnon, 2015)*.

4.6.4   MODERATOR

Next to the two mediators, the conceptual model also includes a categorical moderator. A relationship between two variables may be dependent on the context in which the variables are operating. In this case it is expected that the relationship between control power and goal congruence is dependent on whether the strategic direction has or has not been changed during the lifetime of the JV. This is expected, since a partner with high

control power is not able to steer the strategic direction if the strategic direction has not been changed yet. This chapter will determine whether the moderator is significant enough to include it within the conceptual model.

Some conditions should be met for a moderator effect to exist which are as follows (Baron & Kenny, 1986):

1. The moderator variable is uncorrelated with the independent variable.
2. Path c is significant in the regression model.

The correlation between the variables *control power* and *SD_change* is not significant (r = -.14, *Table 9*) and therefore the first condition is met. To determine the significance of path c in order to test condition 2, a multiple regression analysis is conducted (see Annex XII). Because the independent variable and moderator uses different scales, the variables should be centralised first. This is done by subtracting the mean of each variable. The c-path is made by multiplying the centralised variables (Figure 22).
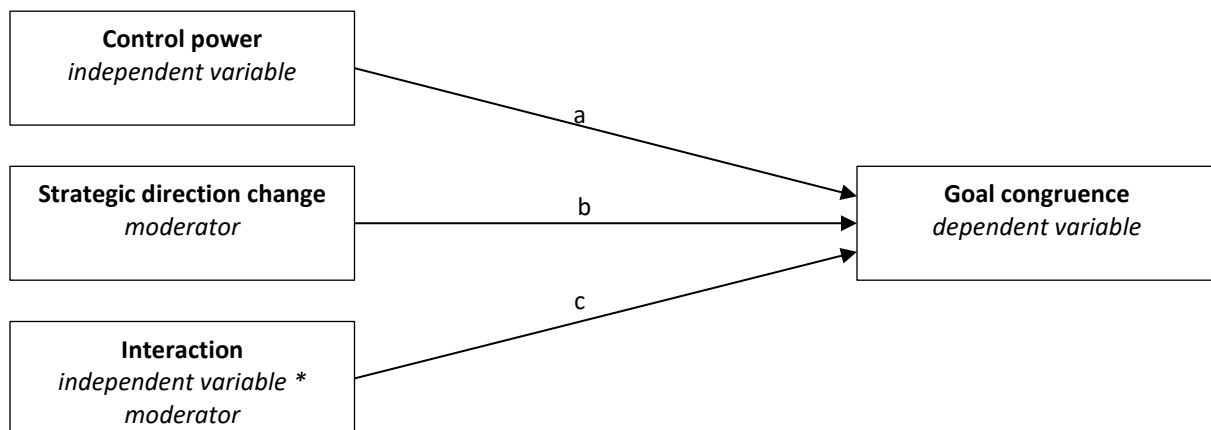
Figure 22 – Moderator model (Baron & Kenny, 1986)**.**

To make sure that the moderating effect exists, the c-path should be significant in Table 12 according to the second condition (Baron & Kenny, 1986). This is the case, and not only is the c-path significant *(p = .01)*, but also are the a and b-path *(p = .02 and p < .001).* This result is similar to the t-test conducted in the prior chapter, which showed significant differences in the mean of goal congruence when controlled for strategic direction change.

Table 12 – Multiple regression results predicting goal congruence.

	B	SE B	β
Model 1	5.90	0.14	
Control power *(centralised)*	-0.50	0.21	-0.19*
Strategic direction change *(centralised)*	2.51	0.27	0.73***
c-path *(multiplied centralised variables)*	1.14	0.43	0.211**

[a] n = 57. R^2 = .67 for model 1, (p < .001).

*** p < .001; ** p < .01; * p < .05; non-significant p > .05.

This chapter showed that the moderator variable is significant *(p = .01),* hence this moderator is valid in the theorised conceptual model.

4.6.5   CONTROL POWER

A multiple regression analysis is conducted to predict the control power of partners to change the strategic direction. This is done to see whether which type of power: non-mediated (expertise power) or mediated power

(financial power) explains the most variance in the degree of control accumulated by one partner. Again not all SPSS output is shown, but is stated in Annex XIII.

To control for extreme cases, each case is assessed for certain statistics. This was also done in the regression analysis in which JV performance was predicted (Chapter 4.6.1). Again the covariance ratio statistic is violated, since the values of 0.83 and 1.16 are outliers of the acceptable interval of 0.85 – 1.15. Next, the other statistics are reviewed: the Cook's distance criterion is satisfied (0.16 < 1.0), centred leverage value is satisfied (0.07 < 0.10), Mahalanobis distance is satisfied (4.16 < 11.0), and all the DFBeta statistics are below 1.0. The extremes cases are deleted from the model and a multiple regression analysis is conducted with 55 subjects.

When financial power is used to predict the control power of one partner in the JV, it explains 20.3% of the variance in the performance *(R^2 = .203, Table 13)*. The explained variance increases when expertise power is added to the model *(R^2 = .293, Table 13)*.. For both models the F-ratios are highly significant *(p < .001)*, however the F-ratio decreases from 13.51 to 10.78 when expertise power is added to the model. These F-ratios are above 1.00, which suggest that the models are able to predict the outcome of control power, but model 1 is better to do so. In both models the VIF score *(model 1 = 1.00 and model 2 = 1.01)* is below 10, which implies that multicollinearity is not biasing the models (Field, 2009).

Table 13 – Multiple regression results predicting control power.

	B	SE B	β
Model 1			
Constant	1.22	0.24	
Financial power	0.41	0.11	0.45**
Model 2			
Constant	0.69	0.30	
Financial power	0.39	0.11	0.43**
Expertise power	0.28	0.11	0.30*

[a] n = 55. R^2 = .20 for model 1, ΔR^2 = .09 for model 2 (p < .05).

** p < .01; * p < .05; non-significant p > .05.

The regression model is able to formulate a relationship for both models since the t-statistics are significant (p < 0.05). The following equation for control power is formulated based on the unstandardised coefficients (model 2).

$$Control\ power = 0.75 + 0.39 * Financial\ power + 0.28 * Expertise\ power$$

All the variables in this equation use the following range: 1 = majority power, 2 = equal power, and 3 = minor power. So, a low outcome of the equation above would imply high control power. When a partner invests an equal amount of financial resources instead of the majority (an increase of one unit), then this partner's control power will increase with 0.39 units (partner loses control power). As the contributed expertise increases by one unit, then control power will increase with 0.28 units. These interpretations are only true when the other independent variable is held constant.

The research objective of this thesis is to assess how the variables opportunistic behaviour and trust affect the performance of asymmetric JVs. Following from the literature review the relationships among the concepts were visualised in a conceptual model. The path analysis conducted in this chapter showed the conceptual model is effective enough to explain the relationships among the variables with the provided data. The relationships within the conceptual model were tested and are summarised in the table below.

Table 14 - Summary of the validated relationships.

Number	Relationship	Status	Test
1.1	Larger sized organisations in asymmetric JVs will invest the most financial resources more frequently than the smaller sized organisations.	Approved	Independent two samples T-test
1.2 (null)	The amount of symmetric JVs outweigh the amount of asymmetric JVs which are established in the last 10 years.	Rejected	One sample t-test
1.2 (alt)	The amount of asymmetric JVs outweigh the amount of symmetric JVs which are established in the last 10 years.	Approved	One sample t-test
2.1	Goal congruence is positively related with JV performance.	Approved	Bivariate analysis
2.2	Goal congruence is positively related with trust.	Approved	Bivariate analysis
3.1	Control power is negatively related to goal congruence when the strategic direction has changed.	Approved	Bivariate analysis (split cases)
3.2	Control power is not related with goal congruence when the strategic direction has not changed.	Rejected	Bivariate analysis (split cases)
3.3	The degree of financial resources invested is positively related with control power.	Approved	Bivariate analysis
3.4	The degree of expertise in the JV is positively related with control power.	Approved	Bivariate analysis
3.5	If JVs get more asymmetric, then the larger organisations will invest the majority of financial resources more frequently.	Rejected	Independent two samples T-test
4.1	Trust is positively related with JV performance.	Approved	Bivariate analysis
Moderator	Strategic manipulative opportunism cannot occur when the strategic direction has not been changed during the lifetime of the JV.	Approved	Multiple regression analysis
Mediator	The relationship between goal congruence and JV performance is mediated by trust.	Approved	Multiple regression analysis (PROCESS add-in)

The third central question is answered in this chapter: *"How do the variables power imbalance, opportunistic behaviour, and trust relate to each other?".* Following from the conceptual model and the approved hypotheses, the following relationships may be observed. Financial and expertise power are positively related with control power, which suggests that not only financial investments are related to more control in JVs but also the degree

of expertise contributed to the JV. This relationship is supported by the multiple regression analysis which shows that for every unit of financial resources contributed 0.39 units of control power are gained, and for every unit of expertise 0.28 units of control power are gained. The t-tests showed that in asymmetric JVs, the larger organisations are more likely to invest the majority amount of financial resources and accumulate more control to change the strategic direction of the JV than the smaller sized partners.

This brings us to the next relationship in the conceptual model, which is that control power is negatively related to goal congruence. Which suggests that whenever a partner gains the majority of power then it is likely to steer the strategic direction to their own benefit, which reduces the degree of goal congruence. Because goal congruence is reduced, the other partner might be less incentivised to act cooperative as her initial goals of the JVs are jeopardised, which results in a drop of JV performance. This is supported by a t-test in which the partners were not able to abuse their majority of control power because there was no strategic direction change, have higher goal congruence, trust, and JV performance.

The degree of goal congruence is positively related with trust and JV performance which has been proven with a multiple regression analysis. This analysis also showed that trust completely mediates the relationship of goal congruence and JV performance. This suggests that goal congruence does not have a direct effect on JV performance, but is always indirect via the degree of trust among the partners.

A t-test showed that an imbalance in financial power and control power between the partners does not necessary relate to significant mean differences with JVs with a balance in financial power and control power. However, an balance in expertise power does relate to higher JV performance, less strategic direction changes, and higher goal congruence.

Finally, the path analysis showed that the relationship between control power and trust is partially mediated by goal congruence. How this mediating effect and the other results listed above are interpreted with theory, and how this adds to the scientific and practical relevance of this research will be discussed in the following chapter.

5.1 SUMMARY

The objective of this chapter was to interpret the results from the results chapter to address the research objective. This was done by combining the found relationships with the literature. The literature is already partially described in the literature review, however some additional articles were required to understand or explain found relationships. The findings do corroborate the notion of Pérez et al. (2012) who argue around the asymmetric alliance concept based on dissimilar sized organisations. The practical relevance of this research prescribes executives of asymmetric JVs to be aware of disguised opportunistic behaviour of the larger partner and the critical relationship between trust and JV performance. To build trust in an asymmetric JV, however, may be more of a challenging task than in symmetric JVs due lack of familiarity. Future research may conduct a more comprehensive study to assess more characteristics which affect the JV performance of asymmetric joint ventures.

5.2 INTRODUCTION

This chapter will focus on answering the following research question: "*How does opportunism and trust between asymmetric sized partners affect the JV performance?*". This will be done by showing the main findings of each hypothesis. Next, the theoretical and practical relevance of these findings are discussed. The next section will focus on the limitations of this study and how this could be tackled in future research. Finally, the whole thesis will be concluded in the conclusion section.

5.3 DISCUSSION

This research focused on asymmetric JVs which are JVs established between dissimilar sized organisations (Pérez et al., 2012). These kind of JVs are subject to specific opportunistic behaviour that emerge due to the different endowments of resources by each organisation. A smaller organisation is likely to lack financial resources to commercialise an innovation and therefore needs to collaborate with a larger organisation to gain access to these resources (Beamish & Jung, 2005). Therefore it is expected that the larger organisation endows the majority of resources to the JV, and therefore accumulates the most power. An imbalance in bargaining power may promote strategic manipulative opportunistic behaviour that could reduce goal congruence, which is detrimental to the JV performance (Nyaga et al., 2013). To further explore the concept of asymmetric alliances, this study focused on asymmetric JVs and assessed how goal congruence affects the JV performance. Also trust is included, since trust is expected to be influenced by the degree of goal congruence (Gulati & Singh, 1998; Kale et al., 2000). To study these relationships, data was retrieved from alliance and financial databases, and a survey was sent to JV executives to measure the following constructs: power imbalance, goal congruence, trust, and JV performance.

ASYMMETRIC JOINT VENTURES

Almost 70% of the JVs established worldwide in the last ten years were found to be asymmetrical (H1.2). The turnover ratio ranges from one to over 13,000 which suggests that JVs are established between very similar and extreme dissimilar organisations. A turnover ratio of five is used as criterion to distinguish between symmetric JVs and asymmetric JVs, which is based on other articles that also used a ratio to control for firm size (Kalaignanam et al., 2007). A turnover ratio of five means that the larger organisation has five times the amount of the smaller organisation's turnover and therefore has a more sizeable resource pool to endow resources to the JV. One could argue that this ratio of five is too low and therefore the majority of asymmetric JVs appears to be high in the results. However, if this criterion is to be raised to thirteen (the median), then still 50% of the JVs are asymmetrical. Therefore, taking upon the notion of asymmetric JVs is relevant as the majority of recently

established JV worldwide are asymmetrical. This aligns with the theory that due recent market barriers, such as globalisation of business and rising research and development costs (Kilubi & Haasis, 2016; Teece, 1986), that smaller organisations are combining resources with larger sized organisations to overcome the market barriers (Beamish & Jung, 2005).

This study focuses on the power gained by either the amount of financial resources contributed to the JV and the degree of expertise of each partner. The study did not found any difference in the degree of expertise relative to the size of the partners. One could argue that the larger organisation would be the expert in every asymmetric JV due a sizeable knowledge base, however this is rejected within this study. Larger organisations collaborate with smaller organisations to gain access to proprietary knowledge that is owned by the smaller organisation to innovate (Alvarez & Barney, 2005). This knowledge is close to the larger organisation's core business and therefore no significant relationship was probably found between partner size and the degree of expertise power.

The findings do show that within the asymmetric JVs, that the larger organisation is the most likely to invest the majority of financial resources (H1.1). This result is as expected since larger organisations simply have more resources to share in an JV than smaller organisations. This likelihood increases when the asymmetry increases. When looking at the mean differences: the higher the asymmetry of the JV, the more the chance that the larger organisation invested the majority of financial resources (H3.5). Although the latter result was not significant enough to prove, this relationship may, however, be explained in the following manner. An extreme asymmetric JV would suggest that the larger organisation have significant more resources than the smaller organisation, which reduces the incentive for the smaller organisation to share their financial resources as their contribution will never match the investment made by the larger organisation (Xue et al., 2016). In this case, it is more likely that the smaller organisation will possess the majority of knowledge required for the innovation at hand in the JV such as proprietary knowledge.

When asymmetry is relatively small, then it is more likely that the smaller organisation will invest the majority of financial resources. This may be explained in the way that the difference in the resource pools of the partners becomes less extreme and therefore the smaller organisation is able to invest the majority. The smaller organisation may decide that the strategic direction of the JV is important to her survival and will therefore invest more than the larger organisation to accumulate the most bargaining power. However this speculated since this is not specifically measured within this research.

If the relationship between asymmetry and amount of financial resources invested in the JV is to be found significant in a more comprehensive study, then the following challenges should be taken into account by the smaller sized organisation. If asymmetry is high, then smaller organisations cannot match the investment made by the larger organisation by which it accumulates low control power and therefore loses control to limit the larger partner's opportunistic behaviour (Nyaga et al., 2013). The achievement of the strategic direction may be critical to the survival of the smaller organisation, which is jeopardised by the low degree of control power. Next, the endowments made by the smaller organisation may be a significant proportion of their resource pool while the investment made by the larger organisation is a small proportion of their resources. Combined with the fact that the larger organisation will accumulate more control power over the strategic direction, the larger organisation may pursue more riskier projects with the JV, which also jeopardises the survival of the smaller organisation.

POWER IMBALANCE AND GOAL CONGRUENCE

Financial and expertise power were found to be positively related with control power (H3.3 and 3.4). This aligns with the study of Nyaga et al. (2013) who argue that control power is gained by multiple sources of power; non-mediated power and mediated power. Also the review paper of Ren et al. (2009) shows that control power is partially determined by the contribution of strategic resources (financial resources and knowledge). Therefore it can be learned that not only the financial endowments will solely determine each partner's control over the strategic direction but other types of endowments may also contribute to this, such as expertise. This finding

provides smaller organisations the opportunity to gain control power in asymmetric JVs in which the larger organisations accumulated the majority of the control power based on financial endowments. The smaller organisation may limit the control power of the larger organisation by significantly contributing in expertise to the JV. However, she must be aware of the fact that if this knowledge is shared within the JV, that she loses her expertise power. To maintain expertise power, the smaller organisation must carefully share the knowledge within the JV to control the larger organisation's incentive to collaborate with her. If she does not, then the larger organisation fully learns about her knowledge and loses its incentive to collaborate, which may put the survival of the smaller organisation at risk. Next, this finding also implicates that it is unwise for smaller organisations to enter an asymmetric JV in which they do not possess the majority of the required expertise next to financial resources, since this will ultimately result in low bargaining power that endangers the survivability of their organisation.

When the smaller and larger organisation contributed an equal amount of expertise to the JV, then this results in higher JV performance, higher goal congruence, and less strategic direction changes than JVs with an imbalance in expertise power. Because both partners are experts, they might be better able to formulate the strategic direction at the start of the JV, which results into less adjustments to correct any misalignments. Because the initial strategic direction is better understood, the JVs are less subject to strategic manipulative opportunism as less strategic direction changes are made and therefore achieve higher goal congruence. Also less misunderstandings may emerge between the partners which promotes cooperative behaviour and thus trust (Jong, 2016; Silva et al., 2012). This finding aligns with the study of Xue et al. (2016) who argue that due a power imbalance in expertise, opportunistic behaviour is promoted. The powerful partner is trusted by the weaker partner due high competence trust, which the powerful partner may abuse to act opportunistic.

While a different balance in expertise power result in significant differences in JV performance, non-significant differences were found when a financial (im)balance or control power (im)balance existed in the JV. This suggests that JV performance is not affected by different balances in either financial power or control power. However, the non-significance is probably contributed to the lack of statistical power and therefore fails to identify an effect, since the mean differences do suggest that a power imbalance in either financial power or control power do result in lower JV performance. This is expected, because this study found that control power does negatively affect goal congruence (H3.1), which could reduce the incentive for a partner to act cooperative and which also negatively affects JV performance. This aligns with multiple authors who argue that bargaining power is related to strategic manipulative opportunism (Ren et al., 2009; Walter et al., 2015). However, strategic manipulative opportunism is only possible when the initial strategic direction has been 0changed during the operation of the JV. Hence, the degree of goal congruence cannot be affected when the strategic direction of the JV has not been changed yet. Therefore the relationship between control power and goal congruence is moderated (H3.2). JVs with no strategic direction change have higher goal congruence and higher JV performance. The higher performance and higher goal congruence may be contributed to the fact that the strategic direction was not affected by strategic manipulative opportunism to gain private rents. This kind of opportunistic behaviour is done at the expense of the JV performance since cooperative behaviour will be limited thereafter (Walter et al., 2015; Xue et al., 2016). This limits the relational openness and trust, since the partners do not perceive each other as integer as before (Fulmer & Gelfand, 2012). This is supported by this study that when goal congruence is limited, trust among the partners decreases. Despite the fact that JV performance decreases due lower goal congruence does not imply that both partners are disadvantaged since one partner may accumulate private rents on the expense of the other.

The practical relevance of the relationship between power imbalance and goal congruence is that in asymmetric JVs power imbalances are likely to exist which could incentivise opportunistic behaviour. The more control power accumulated by either financial or expertise endowments to the JV, the more opportunistic a partner could act. This is seen by the fact that control power negatively influences goal congruence, what is argued to be limited by strategic opportunistic behaviour. This finding should not be interpreted that control power should be used

to steer the strategic direction to one partner's own interests to accumulate more rents from the alliance, since these rents are mostly short-term oriented and will jeopardise the long-term rents from the alliance (Silva et al., 2012). Also acting opportunistic may challenge future alliances with the focal partner and other organisations due interorganisational trust (Poppo et al., 2008). If an organisation decides to act opportunistic on the expense of the other organisation in several alliances, then this may back-fire in the future. Due networking effects, external organisations may become acknowledged of the opportunistic organisation by which trust is reduced in potential future alliances which limits the opportunistic organisation's survival in a competitive market. High control levels may also be used to show benevolence to the weaker partner, which increases trust and promotes cooperative behaviour and therefore increases the long-term benefits gained by the JV (Schoorman et al., 2007).

TRUST

The degree of goal congruence is positively related with JV performance and is fully mediated by trust (H2.1, 2.2 and 4.1). The literature is not consistent on proving that trust is positive related with JV performance since authors do or do not find significant results within their study for this relationship (Silva et al., 2012). This study's findings support the literature stream in which a large effect was found between trust and JV performance.

The mediating effect suggests that goal congruence does not have a direct effect on JV performance at all, but indirectly affects JV performance via the degree of trust among the partners. This hints that if goal congruence is affected by strategic manipulative opportunistic behaviour, that it may not even be recognised by the weaker partner. Since high levels of trust may make her perceive the powerful partner as benevolent to change to strategic direction to a win-win situation. However, during the operation of the new strategic direction, the weaker partner may start to recognise that she is disadvantaged by the strategic direction change by which she perceives her partner as less benevolent and therefore less trustworthy, which limits cooperative behaviour (Gulati et al., 2012). This aligns with the general definition of opportunistic behaviour; *"self-interest seeking with guile, (Walter et al., 2015)",* the weaker partner might not recognise opportunism as this may be disguised as a win-win situation by which she was misled. If trust is already challenged between the partners, then a strategic direction change will more quickly affect JV performance. Because the weaker partner may be suspicious and therefore question the strategic direction change by the powerful partner. Although the actions of the powerful partner may not be intended as opportunistic, the weaker partner still may fear opportunistic behaviour by which she disinvests in the relationship by withholding information (Ireland & Webb, 2007).

The practical implication of this finding is that organisations, especially smaller organisations in asymmetric JVs, should be aware of opportunistic behaviour which could reduce the goal congruence. The reason for both organisations to establish an JV is that they both can financially gain from it. Therefore, JV partners perceive each other trustworthy since they believe that trusting the other party is in the interest of themselves (Schilke & Cook, 2015). This trust is based upon calculative and institutional trust (D. M. Rousseau, Sitkin, Burt, & Camerer, 1998). During the operation of the JV, the partners become more familiar with each other through which the partners may perceive each other as benevolent and integer. Due to the interactions over time, the calculative trust turns into relational trust which means that when the partners violate the relationship, the relationship will be likely to be restored (Fulmer & Gelfand, 2012). This interplay of trust is challenged by the degree of absorptive capacity. Due to the different sizes of absorptive capacities of the participating organisations in the asymmetric JV, the larger organisation may outlearn the other partner or identify new opportunities within the JV, that she can follow in self-interest by behaving opportunistic (Jiang et al., 2013). However, in a relational trust setting the larger organisation is enabled to act more opportunistic, since the smaller organisation may still perceive the larger organisation as benevolent and integer when the strategic direction is to be changed. This assumption can be supported with the interplay of interpersonal and interorganisational trust. Zaheer et al. (1998) argue that boundary spanners are more involved in the relationship of the JV partners than other departments of an organisation. Therefore, recognised opportunistic behaviour on the boundary spanner level (interpersonal trust) may not be recognised by the executives who decide over the survival of the JV (interorganisational trust). This

implicates that opportunistic behaviour is first recognised on interpersonal level while it takes time to affect the interorganisational trust. This is seen in the model in which goal congruence and JV performance is mediated by trust.

The results of the path analysis suggest that the relationship of control power and trust is partially mediated by goal congruence. Gulati et al. (2012) argue that when the strategic direction of the JV is in conflict with the interests of both partners that it will harm the relationship over time. Therefore, it could be suggested that the trust between the weaker and powerful partner within an asymmetric JV depends on the powerful partner's decision to alter the strategic direction. She can do this in favour of both organisations to shape a win-win situation by which she is perceived more benevolent by the other partner and ultimately gains trust (Nyaga et al., 2013). However, she may also decide to act opportunistic on the expense of the weaker partner. This finding implicates that high control power is not decisive to opportunistic behaviour which was suggested by the initial conceptual model. A powerful partner may decide to change the strategic direction to either a win-win or a win-lose situation.

5.4   THEORETICAL IMPLICATIONS

This paper extended the strategic alliance literature by focussing on asymmetric alliances, specifically asymmetric JVs. Hottenrot & Lopes-Bento (2016) argued that potential drawbacks of alliances, such as opportunistic behaviour, are under addressed in the literature of strategic alliances. This was also seen in articles addressing asymmetric alliances, in which authors like Mahamadou (2016), Chen and Chen (2002), Beamish and Jung (2005), and Pérez et al. (2012) investigated asymmetric alliances but did mention or did not measure opportunistic behaviour specifically. Therefore, this research took up on the argument of the authors Hottenrot & Lopes-Bento by investigating it in asymmetric alliances. Next, the scope was narrowed down to asymmetric JVs, because it was expected that opportunistic behaviour in JVs was promoted by different resource endowments of the asymmetrically sized partners. The findings of this paper provide new insights in how power imbalances between asymmetrically sized JV partners affect the goal congruence and trust between them, which ultimately affect the JV performance. Specific contributions to the current state of knowledge will be discussed below.

The results show that nearly 70% of the JVs established worldwide in the last ten years are asymmetric. Next, the research shows (non-significant, however) that asymmetric JVs achieve lower JV performance, are subject to less goal congruence, and have lower degrees of trust than symmetric JVs. Some other articles citing asymmetric alliances also found that asymmetric alliances achieve lower performance than symmetric alliances (Mahamadou, 2016; Pérez et al., 2012). Despite these empirical findings, the recent literature describing asymmetric alliances is still insufficient and is mainly focused on symmetric alliances, this can be argued since there is not even a framework to classify asymmetric alliances (Mahamadou, 2016). Next to the lack of literature describing asymmetric alliances, the literature to this date did barely (or did not) touch the subject of asymmetric JVs in which specific characteristics are described that may negatively affect JV performance. JVs are a specific type of alliances which are mostly expected to differ from non-equity based alliances. This is argued since non-equity based alliances do not involve exchanges of equity which determine control power, but are based on contractual agreements (Gulati & Singh, 1998).

This research studied strategic manipulative opportunistic behaviour emergent in asymmetric JVs by focussing on the degree of goal congruence. This is done because strategic manipulative opportunism changes the degree of goal congruence. The results of this study indicate that power imbalance is gained through different endowments of resources (financial or expertise) made by the larger and smaller organisation. The power imbalance is most of the times in favour of the larger organisation by which it is enabled to act opportunistic on the expense of the smaller organisation. Because the smaller organisation cannot control the strategic direction, she must have trust in the larger organisation that it will not abuse its bargaining power to act opportunistic. This is confirmed by the fact the relationship between control power and trust is mediated by the degree of goal

congruence. If the larger organisation does not abuse its majority bargaining power to act opportunistic and thus not changing the strategic direction to its own benefit, then the smaller partner will be incentivised to trust the larger organisation more.

Also the study showed that the larger organisations have more control over the strategic direction than smaller organisations, which indicate that the powerful actor in asymmetric JVs are mainly the larger organisations. This is not the case in symmetric JVs in which JVs are established between similar sized and competing organisations. Walter et al. (2015) identified that symmetric JVs are also subject to appropriation of core technologies due opportunism, but does not indicate the direction of which partner may appropriate the technology. Also strategic manipulative opportunism is expected to be different across symmetric and asymmetrically JVs. This kind of opportunism is relatively easy to apply by the powerful actor in asymmetric JVs due hierarchy; the larger partner has the majority control over the strategic direction. However, in symmetric JVs, in which the partners are similar sized and therefore have an equal amount of power, negotiations are required to influence the other partner's interests. To do this, detailed long-planned strategic plans are developed by the opportunistic partner, which often have radical consequences for the other partner. This may be done to deter (potential) competition by misleading them in an JV (Walter et al., 2015).

Next, this research made an attempt to establish a framework to classify asymmetric JVs, since there is not yet an accepted framework to do this (Mahamadou, 2016). This research distinguished JVs into asymmetric JVs when the turnover ratio between the organisations is at least five. However, this criteria brings in two implications when a theoretical framework is established to characterise asymmetric alliances. The turnover ratio suggests that it can only be used for JVs owned by two organisations. Yet, the alliance database SDC Platinum showed that there were at least 852 JVs established among more than two organisations, which represents roughly ten percent of the total JVs established worldwide in the last ten years. Hence, using a ratio is not sufficient alone when a researcher wants to study JVs with more than two partners. The second implication is that no distinction is made among asymmetric JVs, such as an JV between an entrepreneurial and a large firm, and an JV between incumbents. One could expect that the characteristics of the latter JV differ with the former JV. Asymmetric JVs established by incumbents may have been established between subsidiaries and or between sub-divisions, through which the turnover ratio does not represent the actual size of the partner.

5.5 PRACTICAL IMPLICATIONS

The practical objective of this research was to make JV executives more aware on how JV performance is influenced by characteristics of asymmetric JVs. The previous part already discussed some of the practical implications for executives from the perspective from either the smaller or the larger organisation in the asymmetric JV. The discussion mainly focused on the practical relevance for the smaller organisation within the asymmetric JV. This is done as literature is mainly pointing out the implications for managers of the larger organisations (Lee et al., 2010; Yang, Zheng, & Zhao, 2014).

In overall, this study found that bargaining power is determined by the degree of financial resources and expertise contributed to the JV. A power imbalance is mainly in favour of the larger partner as she endowed the majority of financial resources. This implicates that a smaller organisation may still limit the bargaining power of the larger partner by contributing the majority of expertise. However, when possessing the majority of expertise may introduce a new challenge for the smaller organisation. In order for the JV to successfully operate, the shared innovation has to be fully understood by both partners, which puts the smaller organisation at risk. The larger partner may start underinvest in the JV, because she lost incentive to collaborate when she fully learned about the shared innovation. To tackle this, the authors Alvarez and Barney (2005) provide suggestions for smaller organisation to reduce this risk, such as by providing future technological opportunities (increased alliance horizon (Das & Rahman, 2010)).

The smaller organisation should also be aware of JVs in which she does not possess the majority of the required expertise and or financial resources since this will limit her bargaining power and become prone to the powerful partner's opportunistic behaviour. Next, when an JV may be a significant proportion of an organisation's total assets, it may be wise to accumulate bargaining power, because otherwise the focal organisation's survival will be put in the hands of the powerful organisation. The powerful organisation may act benevolent which will positively affect the growth of the weaker organisation, but may also act opportunistic on the expense of the weaker organisation.

This study also indicates that the relationship between goal congruence and JV performance is fully mediated by trust. This has already been discussed in the previous part, but in short this entails that if goal congruence is affected by opportunistic behaviour that it does not directly affect JV performance as it requires time to surface. At first the powerful partner may be perceived as trustworthy, but after a while when the weaker partner realises that she is misled, she will disinvest in the relationship as the powerful actor cannot be perceived as trustworthy anymore. A reduced degree of trust limits relational openness and therefore limits cooperative behaviour and JV performance (Gulati et al., 2012). This suggest that executives should be aware of opportunistic behaviour of untrustworthy partners but also of trustworthy partners. This can be done by questioning why a strategic direction is proposed and whether this is still in the focal organisation's interests. Blindly following a trustworthy partner may result in opportunistic behaviour, since the powerful partner may calculate that the rents accumulated by acting opportunistic outweigh the rents gained by cooperation. This could be strengthened by the different sizes of absorptive capacities between the partners in asymmetric JVs. The larger partner may have outlearned the smaller partner and have identified new (private) opportunities to explore. This absorptive capacity is increased by the fact that larger organisations are more likely to engage in several JVs which enrich their knowledge base to discover new opportunities (Kostopoulos, Papalexandris, Papachroni, & Ioannou, 2011). Because the partners differ in absorptive capacity, opportunities may not be recognised by the smaller partner but do get recognised by the larger partner which results in ignorance for the smaller partner.

Trust accounts for nearly 60% of the variance in JV performance within this study and therefore is critical in asymmetric JVs to achieve high JV performance. However, to build trust in an asymmetric JV may be more challenging than in a symmetric JVs, since the partners greatly differ from each other in organisational size and practices (Beamish & Jung, 2005). Fulmer and Gelfand (2012) argue that shared characteristics increase trust among the partners due mutual understanding. Because asymmetric JVs are JVs between dissimilar organisations, it is expected that they differ largely in shared characteristics and therefore may have trouble in building a relationship over time. To reduce uncertainties, an organisation may decide only to establish JVs with organisations with which they share a substantial amount of characteristics since this may help both to build trust in an asymmetric JV. In contrast with asymmetric alliances, building trust in JVs may evolve more smoothly than in asymmetric alliances, since both partners are highly adapted by equity investments in the JV (Nyaga et al., 2013).

5.6   LIMITATIONS AND FUTURE RESEARCH

During this research several limitations were identified that can be improved in future research. The limitations are subdivided into theoretical and statistical limitations.

5.6.1   THEORETICAL LIMITATIONS

- ▪ *Symmetric JVs:* The present research studied how asymmetric JVs were influences by power imbalances and was not dedicated to compare this group with symmetric JVs. Prior research and this research (non-significant, however) showed that asymmetric alliances achieve lower JV performance (Mahamadou, 2016; Pérez et al., 2012). A future research may corroborate these studies to check whether the mean differences between symmetric and asymmetric JVs are also significantly different for the JV alliance structure.

- *Mechanisms:* This study focused on the mediated and non-mediated power types identified by Nyaga et al. (2013) of which financial, control, and expertise power were considered to be the most important. However, more sources of power and or other mechanisms may promote opportunistic behaviour in asymmetric JVs. Mechanisms may include operational processes by which the weaker organisations limit opportunistic behaviour in JVs in which they are disadvantaged by a power imbalance. For example, the weaker partner may protect or defend itself against the powerful partner with contractual agreements (institutional trust (D. M. Rousseau et al., 1998)). A future study may give more insight in how opportunism is promoted in asymmetric JVs by including more mechanisms.

- *Asymmetric JVs*: The designation used for asymmetric JV partners may incorrectly imply that this research is based on JVs between small organisations (e.g. less than one million turnover) and large organisations. However, within this research an asymmetric JV is also an organisation with e.g. two billion turnover and an organisation with ten billion turnover. Which challenges the results of this research since JVs between incumbents may have been established between subsidiaries or sub-divisions. Therefore the turnover ratio of the whole organisation may not reflect the actual size of the sub-division. A future research should look into how this distinction between asymmetric JVs can be enhanced. This might provide even stronger effects for asymmetric JVs than this research did, since this research probably included JVs in which JVs were established between subsidiaries or sub-divisions.

- *Cultural diversity:* Cultural diversity is expected to influence opportunistic behaviour (Das & Rahman, 2010). This effect could not be identified with the sample size used in this research. However, this effect may be critical as this research focused on worldwide JVs. JVs between organisations with the same mother language may achieve higher JV performance than supranational JVs. This is argued as familiarity breeds trust and thereby positively affects JV performance (Fulmer & Gelfand, 2012).

- *Opportunistic behaviour:* goal congruence was measured to measure strategic manipulative opportunistic behaviour indirectly. This was done because the answers to the questions tapping opportunistic behaviour were expected to be biased to socially desirability (Sekaran & Bougie, 2009). To prevent this, questions were asked about the strategic direction and how this was changed in the interests of both partners. Because strategic manipulative opportunism affects the strategic direction of the JV, a change in the strategic direction in the interest of only one partner would indicate opportunism and thus low goal congruence. Because opportunism was indirectly measured, interpreting the results with regard to opportunistic behaviour should be done carefully. A more comprehensive study may use more questions to tap the opportunistic behaviour construct directly by using methods that control for the social desirability tendency.

5.6.2   STATISTICAL LIMITATIONS

- *Survey size:* The survey was limited in questions in order to decrease the time required to finish the survey. Due the limitations of questions not all constructs are reliable enough. The constructs goal congruence, JV performance and trust were found to be reliable. However, the constructs trust, control power, financial power, and expertise power were measured by a single-item construct. Single-item constructs are acceptable when they measure self-reported facts, however they are inadequate when they are used to measure psychological constructs (Wanous, Reichers, & Hudy, 1997). The limitation of a single-item construct is that the reliability of such a construct is unknown. Control power, financial power, and expertise power may be regarded as self-reported facts, but trust must be regarded as a psychological construct. Hence, the reliability of the trust construct is unknown which challenges the reliability of the results. A more comprehensive study may give room for more questions to tap the trust construct with multiple questions.

- *Sample size*: The survey resulted in 77 fully completed surveys, which is limited to identify medium to large. This implies that a type II error could be biasing the results as small to medium effect cannot be identified due the lack of statistical power. Due to the fact that this research was time and budget constrained a more comprehensive study could result in more response by e.g. personally administered telephone interviews. A larger sample size would tackle the type II error by which the data is able to detect small to medium effects.

5.7 CONCLUSION

JVs are established worldwide to overcome market trends and firm size specific challenges (Kilubi & Haasis, 2016; Teece, 1986). Small sized organisations, for example, collaborate with larger sized organisations to gain financial resources to develop and introduce their innovations to the market. By these collaborations, larger sized organisations are also enabled to overcome their size-specific challenge by renewing their core business models through innovating (Rothaermel, 2001). However, JVs are not only beneficial as they are also subject to opportunistic behaviour. This kind of behaviour is promoted by the degree of control power gained through power imbalances between the partners of an JV (Nyaga et al., 2013). These power imbalances are expected to prevail in asymmetric JVs, since a larger organisation will presumably be the powerful actor through her ability to endow more resources than the smaller partner to the JV. Also opportunistic behaviour is expected to negatively influence trust which eventually affects JV performance since cooperative behaviour will be limited (Ireland & Webb, 2007). To explore the effect of opportunistic behaviour on the performance of asymmetric JVs and how this is limited by trust, the following research objective was formulated: "*How does opportunism and trust between asymmetric sized partners affect the JV performance?*".

The results of this research show that the amount of financial resources and expertise brought to the JV will determine the control power of each partner. The majority of control power is accumulated by the larger organisation through the majority of financial investments made to the JV. Next, control power can be used to alter the strategic direction of the JV which can be done in favour of both partners or in favour of just one partner, by which the goal congruence between the partners changes. The analyses show that whenever the strategic direction was changed that it resulted in lower JV performance, less goal congruence, and lower degrees of trust. This finding could hint on strategic manipulative opportunism as the degree of goal congruence decreased and resulted in a drop of JV performance. This is expected, because opportunistic behaviour increases the rents accumulated by one partner but does this on the expense of the common rents of the JV (Dussauge et al., 2004).

The relationship between goal congruence and JV performance was found to be fully mediated by trust. This suggests that whenever the degree of goal congruence is altered due opportunistic behaviour, it takes time to affect the JV performance. This is explained in the way that opportunism is disguised and that it takes time for the disadvantaged partner to recognise (Walter et al., 2015). When recognised, the opportunistic partner will be perceived as less benevolent and integer by which the degree of trust decreases. Through the lower degree of trust, cooperative behaviour is limited which reduces JV performance. Vice versa, when the powerful partner does not use its majority of control power to act opportunistic, then the weaker partner will perceive the powerful partner as more benevolent and integer which increases JV performance through enhanced trust.

The following practical implications should be taken into account by organisations within asymmetric JVs. First of all, the larger partner is likely to be the powerful partner through its financial investments in the JV. The smaller organisation may limit its control power by significantly contributing in expertise power. However, the smaller partner must be aware of the fact that the larger partner's incentive to collaborate reduces when she fully learns about the shared expertise (Alvarez & Barney, 2005). Secondly, the absorptive capacity of both partners is expected to differ due to the dissimilar sizes. Which implicates that the stronger partner is better at identifying opportunities to enact upon in the JV than the weaker partner which could incentivise opportunistic behaviour. Thirdly, trust has shown to be a critical factor to achieve high JV performance. However, to build trust in an asymmetric JV may be challenging task due to the unfamiliarity of the partners. (Beamish & Jung, 2005).

Nearly 70% of the established JVs worldwide in the recent ten years were found to be asymmetric JVs. Next, asymmetric alliances were found to achieve lower performance than symmetric alliances (Mahamadou, 2016; Pérez et al., 2012). Despite these empirical findings, literature describing asymmetric JVs is still lacking. Future research should be conducted to identify challenges which may unnecessary hamper the performance of asymmetric JVs.

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The table below shows the sample characteristics of the sample in which 1.608 asymmetric JVs were identified by combining the alliance database and financial database. The sample characteristics include 1.556 asymmetric JVs due removal of outliers.

Table 15 - Sample characteristics.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
TR_Log	1556	100,0%	0	0,0%	1556	100,0%

Descriptives

			Statistic	Std. Error
TR_Log	Mean		1,3404	,02534
	95% Confidence Interval for Mean	Lower Bound	1,2907	
		Upper Bound	1,3901	
	5% Trimmed Mean		1,2833	
	Median		1,1156	
	Variance		,999	
	Std. Deviation		,99966	
	Minimum		,00	
	Maximum		4,12	
	Range		4,12	
	Interquartile Range		1,44	
	Skewness		,753	,062
	Kurtosis		-,246	,124

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TR_Log	,092	1556	,000	,934	1556	,000

a. Lilliefors Significance Correction

An one sample t-test was conducted to test hypothesis 1.1, which assumes that there are more symmetric JVs than asymmetric JVs. In the analysis below asymmetric JVs are coded with a value 1,0 and symmetric JVs with a value of 2,0. Because hypothesis 1.1 assumes that more symmetric JVs exist than asymmetric JVs worldwide, the test-value is set above average in which 50% JVs are asymmetric and 50% symmetric. An test-value of 1,8 is used which resembles a majority of symmetric JVs. Because the difference between the mean (1,31) and the expected mean (1,8) is significant, the null hypothesis should be rejected.

Table 16 - One sample t-test.

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Asymmetric_JV	1608	1,3091	,46226	,01153

One-Sample Test

	Test Value = 1.8					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Asymmetric_JV	-42,586	1607	,000	-,49092	-,5135	-,4683

Dear Sir or Madam **X**,

I am a master student at the Delft University of Technology, for which I am researching over 300 joint ventures worldwide. This research is conducted to gain insight in the effect of organisational factors, such as size and trust, on the performance of joint ventures. The practical relevance of this study is to make organisations aware of these factors, in order to improve company performance, since more and more joint ventures are established worldwide.

I was hoping you could answer the 12 closed and 2 open questions below about the joint venture your **organisation X** has or had with **organisation Y**. This will approximately take 4 minutes of your time. As compensation for your time, I will return you the generalised findings of this research, should you be interested. Please note that all of the provided information will be treated as confidential *(the deadline for returning this e-mail is May the 5th, 2017)*.

The survey can be completed by replying to this e-mail or by using the following SurveyMonkey link: https://nl.surveymonkey.com/r/M7HRBWK.

*My apologies in the case if I have incorrectly identified you as participant in this joint venture. Please, if this is the case, could you identify the person within your organisation who is more likely to be familiar with this joint venture? If so, would you forward this e-mail to him or her, or provide me with his or her contact details?

The following questions will ask you about the strategic direction of the joint venture. This strategic direction relates to the objective and shared goals each organisation had at the establishment of the joint venture. The strategic direction is likely to be changed over time due internal events (e.g. governance misfit) and/or due external events (e.g. increased competition).

Instructions: Please indicate for the 9 statements below to what extent you agree or disagree, on a scale ranging from 1 to 7: in which 1 = totally disagree, 4 = neither disagree nor agree (neutral), and 7 = totally agree. Please answer after the "--" after each statement.

1. The joint venture is successful in meeting its strategic direction (insofar). –

2. *If the joint venture is still operating please answer 2a, if not, please answer 2b.*

    2a. The termination of the joint venture is still as specified within the contracts. –

    2b. The termination of the joint venture was unintended. –

If the strategic direction has not been changed at all, please skip 3-6.

3. Both partners could easily agree to change the strategic direction to adapt to new events. --

4. The strategic direction was changed to benefit our organisation. --

5. The strategic direction was changed to benefit the other organisation. --

6. The change of the strategic direction was done in full consent of both organisations. −

7. Our organisation would have made financial sacrifices for the other organisation if needed. --

8. Our organisation would have taken advantage of private opportunities if they arose. --

9. Our organisation completely trusts the other organisation in its actions performed within the joint venture. −

For the following statements please choose among: 1 = the majority / 2 = an equal / 3 = the minority, to fill in the gaps.

10. Our organisation invested ...... amount of financial resources into the joint venture. −

11. Our organisation had .... amount of control when deciding over the strategic objective. --

12. Our organisation had .... degree of expertise compared to the other organisation in the joint venture. --

Open questions:

13. What was your role in the joint venture? -- *e.g. executive, manager, employee, or other (please specify)*

14. Please determine which percentage of the joint venture's goals are achieved (insofar)? -- *e.g. 25%, 50%, or N/A.*

Thank you very much for your participation in this short questionnaire. Again, all the provided information will be treated as confidential. Please, indicate below if you would like to receive the generalised findings of this research, and if you would like to stay involved for further research. Please feel free to mention any remarks you have on this e-mail or research.

Remark −

Thank you in advance,

T.P. (Thom) de Koning

Delft University of Technology, The Netherlands

Faculty of Technology, Policy, and Management

P.S. your e-mail information has been identified with the database SDC Platinum or via internet desk research. A reminder e-mail will be sent in seven days, after which no additional e-mails will be sent. All the provided information will be kept confidential.

The table below shows the codification of the data retrieved from the databases or survey used in SPSS.

Table 17 - Codification of variables used in SPSS.

Name	SPSS Code
Organisation's name of 1st partner	Participants_name
Joint venture date announced	Date
Performance	JV_Performance
Goal congruence	Goal_congruence
Trust	Trust
Question 1 - The joint venture is successful in meeting its strategic direction (insofar). –	Q1_success
Question 2 - The termination of the joint venture is still as specified within the contracts. / The termination of the joint venture was unintended.	Q2_survival
Question 3 - Both partners could easily agree to change the strategic direction to adapt to new events	Q3_SD_easily_ch
Question 4 - The strategic direction was changed to benefit our organisation.	Q4_benefit1
Question 5 - The strategic direction was changed to benefit the other organisation	Q5_benefit2
Combined question 4 and 5; measures strategic opportunism	Q45_strat.man
Question 6 - The change of the strategic direction was done in full consent of both organisations	Q6_SD_consent
Question 7 - Our organisation would have made financial sacrifices for the other organisation if needed.	Q7_finan.sacrifice
Question 8 - Our organisation would have taken advantage of private opportunities if they arose.	Q8_priv.opport
Question 9 - Our organisation completely trusts the other organisation in its actions performed within the joint venture	Q9_trust
Question 10 - Our organisation invested …… amount of financial resources into the joint venture.	Q10_financial_p
Question 11 - Our organisation had ……… amount of control when deciding over the strategic objective.	Q11_control_p
Question 12 - Our organisation had ……… degree of expertise compared to the other organisation in the joint venture.	Q12_expertise_p
Question 13 – What was your role in the joint venture? – e.g. executive, managers, employee, or other *(please specify)*	Q13_role
Question 14 - Please determine which percentage of the joint venture's goals are achieved (insofar)? -- *e.g. 25%, 50%, or N/A.*	Q14_achieved
JV's age in weeks	JV_Age
Strategic direction changed	SD_changed

Two independent t-tests were made to control the response for JV age and late response.

ANNEX IV.I – JV AGE

The results of the t-test below show that there is no significant difference between JVs in which the strategic direction has or has not been changed.

Table 18 – T-test, strategic direction change and JV age.

Group Statistics

	SD_changed	N	Mean	Std. Deviation	Std. Error Mean
JV_Age	Yes, SO changed	25	241,0800	126,57077	25,31415
	No, SO changed	32	208,3438	101,60601	17,96157

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
										95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
JV_Age	Equal variances assumed	1,630	,207	1,084	55	,283	32,73625	30,21051	-27,80697	93,27947
	Equal variances not assumed			1,055	45,350	,297	32,73625	31,03908	-29,76636	95,23886

ANNEX IV.II - LATE RESPONSE

The results of the t-test show that there is no significant difference in goal congruence, JV performance, trust, financial power, control power, expertise power, turnover ratio, and JV age between the early and late response of the survey.

Table 19 - T-test response bias, Group Statistics.

Group Statistics

	Response	N	Mean	Std. Deviation	Std. Error Mean
Goal_Congruence	Early	21	5,8889	1,81455	,39597
	Late	21	6,0635	1,48556	,32418
JV_Performance	Early	21	5,0476	2,15583	,47044
	Late	21	5,1667	1,59948	,34903
Q9_trust	Early	21	5,0952	1,81397	,39584
	Late	21	5,4762	1,24976	,27272
Q10_financial_p	Early	21	1,9524	,66904	,14600
	Late	21	2,0952	,76842	,16768
Q11_control_p	Early	21	1,9524	,49761	,10859
	Late	21	2,0476	,74001	,16148
Q12_expertise_p	Early	21	2,0000	,70711	,15430
	Late	21	2,0000	,70711	,15430
Turnover_ratio	Early	21	355,3340	841,84737	183,70616
	Late	21	339,9082	760,48625	165,95170
TR_Log	Early	21	1,7851	,87186	,19026
	Late	21	1,7334	,87070	,19000
JV_Age	Early	21	214,3333	79,50996	17,35050
	Late	21	234,2381	126,14789	27,52773

Table 20 - T-test response bias, Independent Samples Test.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Goal_Congruence	Equal variances assumed	,358	,553	-,341	40	,735	-,17460	,51174	-1,20887	,85967
	Equal variances not assumed			-,341	38,499	,735	-,17460	,51174	-1,21013	,86092
JV_Performance	Equal variances assumed	2,481	,123	-,203	40	,840	-,11905	,58578	-1,30296	1,06486
	Equal variances not assumed			-,203	36,898	,840	-,11905	,58578	-1,30607	1,06797
Q9_trust	Equal variances assumed	4,343	,044	-,793	40	,433	-,38095	,48069	-1,35247	,59056
	Equal variances not assumed			-,793	35,496	,433	-,38095	,48069	-1,35632	,59442
Q10_financial_p	Equal variances assumed	1,069	,307	-,643	40	,524	-,14286	,22234	-,59221	,30650
	Equal variances not assumed			-,643	39,257	,524	-,14286	,22234	-,59248	,30677
Q11_control_p	Equal variances assumed	3,825	,058	-,489	40	,627	-,09524	,19460	-,48854	,29806
	Equal variances not assumed			-,489	35,017	,628	-,09524	,19460	-,49029	,29981
Q12_expertise_p	Equal variances assumed	,000	1,000	,000	40	1,000	,00000	,21822	-,44103	,44103
	Equal variances not assumed			,000	40,000	1,000	,00000	,21822	-,44103	,44103
Turnover_ratio	Equal variances assumed	,002	,968	,062	40	,951	15,42578	247,56397	-484,91967	515,77123
	Equal variances not assumed			,062	39,594	,951	15,42578	247,56397	-485,07963	515,93120
TR_Log	Equal variances assumed	,010	,921	,192	40	,848	,05173	,26888	-,49171	,59516
	Equal variances not assumed			,192	40,000	,848	,05173	,26888	-,49171	,59516
JV_Age	Equal variances assumed	5,727	,021	-,612	40	,544	-19,90476	32,53944	-85,66943	45,85991
	Equal variances not assumed			-,612	33,725	,545	-19,90476	32,53944	-86,05276	46,24324

Reliability analyses were conducted to measure the Cronbach's α of the following construct: JV performance, goal congruence, power imbalance, and trust.

ANNEX V.I - CONSTRUCT JV PERFORMANCE

The initial Cronbach's α is equal to 0,243 which is insufficient to state that the construct JV performance is reliable. Therefore Q14 is deleted from the construct to gain more reliability.

Table 21 – Reliability statistics and item-total statistics of the measure (1/3): performance.

Reliability Statistics

Cronbach's Alpha	N of Items
,243	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1_succes	62,3200	1289,038	,714	,158
Q2_survival	61,7600	1340,635	,444	,209
Q9_trust	61,9000	1333,765	,650	,200
Q14_achieved	14,6000	29,020	,665	,809

After Q14 was removed, the Cronbach's α raised to 0,792 which is sufficient. However Q9 was also removed due accordance of the theory describing the JV performance construct.

Table 22 - Reliability statistics and item-total statistics of the measure (2/3): performance.

Reliability Statistics

Cronbach's Alpha	N of Items
,792	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1_succes	10,1930	10,873	,701	,648
Q2_survival	9,6842	14,398	,532	,822
Q9_trust	9,8070	14,837	,712	,665

The final Cronbach's α of the construct JV performance is 0,665.

Table 23 - Reliability statistics (3/3): performance.

Reliability Statistics

Cronbach's Alpha	N of Items
,665	2

The Cronbach's α of the goal congruence construct is equal to 0,901.

Table 24 - Reliability statistics and item-total statistics of the measure: goal congruence.

Reliability Statistics

Cronbach's Alpha	N of Items
,901	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q3_SD_easily_ch	11,7895	11,812	,843	,825
Q45_strat.man	12,0000	10,786	,819	,857
Q6_SD_consent	11,2982	14,534	,786	,888

ANNEX V.III - CONSTRUCT POWER IMBALANCE

The Cronbach's α of the power imbalance construct is equal to 0,485 which is insufficient. Also deleting questions form the construct does not enable the construct the be reliable at a Cronbach's α level of 0,70. Therefore each question should be a single item construct; financial power, control power, and expertise power.

Table 25 - Reliability statistics and item-total statistics of the measure: power imbalance.

Reliability Statistics

Cronbach's Alpha	N of Items
,485	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q10_financial_p	4,0526	1,158	,280	,430
Q11_control_p	4,0702	1,031	,492	,064
Q12_expertise_p	4,0526	1,301	,175	,602

ANNEX V.IV - CONSTRUCT TRUST

The Cronbach's α of the trust construct is negative and cannot reach a Cronbach's α higher than 0,70 when questions are deleted from the construct.

Table 26 - Reliability statistics and item-total statistics of the measure: trust.

Reliability Statistics

Cronbach's Alpha[a]	N of Items
-,237	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q7_finan.sacrifice	9,2982	6,892	-,234	,254
Q8_priv.opport	9,6491	4,910	-,036	-,382[a]
Q9_trust	8,8772	4,788	-,008	-,481[a]

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

Therefore the choice is made to measure trust with a single item construct. According to the theory trust should be correlated with JV performance, and thus Q9 is selected as single item construct representing trust.

Table 27 - Correlation matrix (partial).

Correlations

		JV_Performance	Q7_finan. sacrifice	Q8_priv. opport	Q9_trust
JV_Performance	Pearson Correlation	1	-,221[*]	,207	,677[**]
	Sig. (1-tailed)		,049	,061	,000
	N	57	57	57	57
Q7_finan.sacrifice	Pearson Correlation	-,221[*]	1	-,194	-,160
	Sig. (1-tailed)	,049		,074	,117
	N	57	57	57	57
Q8_priv.opport	Pearson Correlation	,207	-,194	1	,145
	Sig. (1-tailed)	,061	,074		,140
	N	57	57	57	57
Q9_trust	Pearson Correlation	,677[**]	-,160	,145	1
	Sig. (1-tailed)	,000	,117	,140	
	N	57	57	57	57

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

The descriptive statistics of the data used for the results chapter is stated below.

Table 28 – Descriptive statistics.

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Q1_succes	57	6,00	1,00	7,00	4,6491	,31113	2,34895	5,518
Q2_survival	57	6,00	1,00	7,00	5,1579	,27737	2,09412	4,385
Q3_SD_easily_ch	57	6,00	1,00	7,00	5,7544	,25315	1,91125	3,653
Q4_benefit1	57	6,00	1,00	7,00	5,9649	,23073	1,74197	3,034
Q5_benefit2	57	6,00	1,00	7,00	6,0175	,21749	1,64199	2,696
Q45_strat.man	57	6,00	1,00	7,00	5,5439	,27882	2,10501	4,431
Q6_SD_consent	57	6,00	1,00	7,00	6,2456	,20985	1,58431	2,510
Q7_finan.sacrifice	57	6,00	1,00	7,00	4,6140	,22494	1,69826	2,884
Q8_priv.opport	57	6,00	1,00	7,00	4,2632	,23149	1,74772	3,055
Q9_trust	57	6,00	1,00	7,00	5,0351	,22800	1,72135	2,963
Q10_financial_p	57	2,00	1,00	3,00	2,0351	,09354	,70622	,499
Q11_control_p	57	2,00	1,00	3,00	2,0175	,08485	,64063	,410
Q12_expertise_p	57	2,00	1,00	3,00	2,0351	,09354	,70622	,499
Q14_achieved	50	100,00	,00	100,00	52,2600	4,78619	33,84346	1145,380
JV_Age	57	481,00	30,00	511,00	222,7018	15,01422	113,35484	12849,320
Turnover_ratio	57	3654,01	5,07	3659,07	307,8898	98,30099	742,15618	550795,795
Date	57	3501 00:00:...	29-JAN-2007	30-AUG-2016	18-AUG-2011	136 08:20:0...	1029 09:34:...	7,910E+15
JV_Performance	57	6,00	1,00	7,00	4,8509	,25648	1,93641	3,750
Goal_Congruence	57	6,00	1,00	7,00	5,8480	,22745	1,71718	2,949
Valid N (listwise)	50							

The table below shows the Pearson correlations among the variables. This test is an bivariate one-tailed test.

Table 29 – Correlation matrix.

Correlations

		Goal_Congruence	Q10_financial_p	Q11_control_p	Q12_expertise_p	JV_Performance	Turnover_ratio	Q9_trust	JV_Age	SD_changed
Goal_Congruence	Pearson Correlation	1	,098	-,306*	-,059	,410**	-,196	,592**	-,252*	,766**
	Sig. (1-tailed)		,235	,010	,331	,001	,072	,000	,030	,000
	N	57	57	57	57	57	57	57	57	57
Q10_financial_p	Pearson Correlation	,098	1	,433**	,033	,017	,252*	,043	,174	,044
	Sig. (1-tailed)	,235		,000	,403	,450	,029	,375	,098	,372
	N	57	57	57	57	57	57	57	57	57
Q11_control_p	Pearson Correlation	-,306*	,433**	1	,275*	-,415**	,009	-,389**	,038	-,143
	Sig. (1-tailed)	,010	,000		,019	,001	,474	,001	,390	,145
	N	57	57	57	57	57	57	57	57	57
Q12_expertise_p	Pearson Correlation	-,059	,033	,275*	1	-,107	-,159	,102	,006	,044
	Sig. (1-tailed)	,331	,403	,019		,214	,118	,226	,482	,372
	N	57	57	57	57	57	57	57	57	57
JV_Performance	Pearson Correlation	,410**	,017	-,415**	-,107	1	-,142	,677**	,108	,346**
	Sig. (1-tailed)	,001	,450	,001	,214		,146	,000	,211	,004
	N	57	57	57	57	57	57	57	57	57
Turnover_ratio	Pearson Correlation	-,196	,252*	,009	-,159	-,142	1	-,088	,013	-,213
	Sig. (1-tailed)	,072	,029	,474	,118	,146		,258	,462	,055
	N	57	57	57	57	57	57	57	57	57
Q9_trust	Pearson Correlation	,592**	,043	-,389**	,102	,677**	-,088	1	-,122	,370**
	Sig. (1-tailed)	,000	,375	,001	,226	,000	,258		,183	,002
	N	57	57	57	57	57	57	57	57	57
JV_Age	Pearson Correlation	-,252*	,174	,038	,006	,108	,013	-,122	1	-,145
	Sig. (1-tailed)	,030	,098	,390	,482	,211	,462	,183		,142
	N	57	57	57	57	57	57	57	57	57
SD_changed	Pearson Correlation	,766**	,044	-,143	,044	,346**	-,213	,370**	-,145	1
	Sig. (1-tailed)	,000	,372	,145	,372	,004	,055	,002	,142	
	N	57	57	57	57	57	57	57	57	57

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

The conceptual model possesses a categorical moderator which is assessed with the table below. The correlation table cannot calculate the correlations when the strategic direction (SD) not has been changed, since these variables are constant. The methodology chapter explained that when the strategic direction has not been changed in the JV, that all the missing values are replaced with sevens. And therefore the split case cannot calculate the correlations for the second group.

Table 30 – Split case correlations.

Correlations

SD_changed			Goal_Con	Q11_control_p
Yes, SD changed	Goal_Con	Pearson Correlation	1	-,450*
		Sig. (1-tailed)		,012
		N	25	25
	Q11_control_p	Pearson Correlation	-,450*	1
		Sig. (1-tailed)	,012	
		N	25	25
No, SD changed	Goal_Con	Pearson Correlation	.b	.b
		Sig. (1-tailed)		.
		N	32	32
	Q11_control_p	Pearson Correlation	.b	1
		Sig. (1-tailed)	.	
		N	32	32

*. Correlation is significant at the 0.05 level (1-tailed).

b. Cannot be computed because at least one of the variables is constant.

ANNEX VIII.I - T-TEST – STRATEGIC DIRECTION CHANGE

This t-test tested the difference between group 1: JVs with strategic direction change and group 2: JVs without strategic direction change. The test showed significant mean differences for goal congruence, JV performance, and trust.

Table 31 – Group statistics of both groups.

Group Statistics

	SD_changed	N	Mean	Std. Deviation	Std. Error Mean
Goal_Congruence	Yes, SD changed	25	4,3733	1,68688	,33738
	No, SD changed	32	7,0000	,00000	,00000
JV_Performance	Yes, SD changed	25	4,1000	2,02073	,40415
	No, SD changed	32	5,4375	1,67404	,29593
Q9_trust	Yes, SD changed	25	4,3200	1,90875	,38175
	No, SD changed	32	5,5938	1,34066	,23700
Q10_financial_p	Yes, SD changed	25	2,0000	,76376	,15275
	No, SD changed	32	2,0625	,66901	,11827
Q11_control_p	Yes, SD changed	25	2,1200	,66583	,13317
	No, SD changed	32	1,9375	,61892	,10941
Q12_expertise_p	Yes, SD changed	25	2,0000	,86603	,17321
	No, SD changed	32	2,0625	,56440	,09977
Turnover_ratio	Yes, SD changed	25	485,5618	1050,32324	210,06465
	No, SD changed	32	169,0835	309,13706	54,64823
TR_Log	Yes, SD changed	25	1,6779	,95555	,19111
	No, SD changed	32	1,6768	,74475	,13165

Table 32 – Result of independent samples t-test.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Goal_Congruence	Equal variances assumed	49,083	,000	-8,831	55	,000	-2,62667	,29744	-3,22275	-2,03058
	Equal variances not assumed			-7,786	24,000	,000	-2,62667	,33738	-3,32298	-1,93036
JV_Performance	Equal variances assumed	1,944	,169	-2,733	55	,008	-1,33750	,48938	-2,31825	-,35675
	Equal variances not assumed			-2,670	46,326	,010	-1,33750	,50091	-2,34558	-,32942
Q9_trust	Equal variances assumed	5,569	,022	-2,958	55	,005	-1,27375	,43065	-2,13678	-,41072
	Equal variances not assumed			-2,835	41,314	,007	-1,27375	,44933	-2,18099	-,36651
Q10_financial_p	Equal variances assumed	,494	,485	-,329	55	,743	-,06250	,19003	-,44333	,31833
	Equal variances not assumed			-,324	48,034	,748	-,06250	,19318	-,45092	,32592
Q11_control_p	Equal variances assumed	,477	,493	1,069	55	,290	,18250	,17078	-,15976	,52476
	Equal variances not assumed			1,059	49,778	,295	,18250	,17235	-,16371	,52871
Q12_expertise_p	Equal variances assumed	9,561	,003	-,329	55	,743	-,06250	,19003	-,44333	,31833
	Equal variances not assumed			-,313	39,226	,756	-,06250	,19989	-,46673	,34173
Turnover_ratio	Equal variances assumed	14,552	,000	1,621	55	,111	316,47826	195,28612	-74,88387	707,84038
	Equal variances not assumed			1,458	27,262	,156	316,47826	217,05664	-128,68516	761,64167
TR_Log	Equal variances assumed	2,007	,162	,005	55	,996	,00117	,22508	-,44991	,45225
	Equal variances not assumed			,005	44,437	,996	,00117	,23207	-,46640	,46874

ANNEX VIII.II - T-TEST - ASYMMETRY AND FINANCIAL POWER – H1.1

This t-test tested the difference between group 1: larger organisations and group 2: smaller organisations. The test showed significant mean differences for the amount of financial and control power accumulated.

Table 33 - T-test firm size and financial power.

Group Statistics

	Large_small	N	Mean	Std. Deviation	Std. Error Mean
Financial	Larger	57	2,2807	,64792	,08582
	Smaller	57	1,7193	,64792	,08582

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Financial	Equal variances assumed	,000	1,000	4,626	112	,000	,56140	,12137	,32093	,80188
	Equal variances not assumed			4,626	112,000	,000	,56140	,12137	,32093	,80188

Table 34 – T-test firm size and control power.

Group Statistics

	Size	N	Mean	Std. Deviation	Std. Error Mean
Control	Smaller	57	1,8772	,62878	,08328
	Larger	57	2,1228	,62878	,08328

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Control	Equal variances assumed	,000	1,000	-2,085	112	,039	-,24561	,11778	-,47898	-,01225
	Equal variances not assumed			-2,085	112,000	,039	-,24561	,11778	-,47898	-,01225

Table 35 – T-test firm size and expertise power.

Group Statistics

	Size	N	Mean	Std. Deviation	Std. Error Mean
Expertise	Smaller	57	1,9298	,70355	,09319
	Larger	57	2,0702	,70355	,09319

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Expertise	Equal variances assumed	,000	1,000	-1,065	112	,289	-,14035	,13179	-,40147	,12077
	Equal variances not assumed			-1,065	112,000	,289	-,14035	,13179	-,40147	,12077

Hypothesis 3.5 argues that due increasing asymmetry, that it is more likely that the larger organisation invests the majority of financial resources within an asymmetric JV. The t-test showed no significant mean differences. However, the t-test did show the expected effect that larger organisations are more frequently investing the majority of financial resources when the asymmetry increases.

Table 36 – T-test comparing the means of minority financial power and equal financial power.

Group Statistics

	Q10_financial_p	N	Mean	Std. Deviation	Std. Error Mean
Turnover_ratio	Minority F Power	6	95,5712	104,66537	42,72946
	Equal F Power	29	267,8498	535,40784	99,42274

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Turnover_ratio	Equal variances assumed	1,629	,211	-,776	33	,443	-172,27860	221,94378	-623,82662	279,26942
	Equal variances not assumed			-1,592	32,995	,121	-172,27860	108,21593	-392,44682	47,88962

Table 37 - T-test comparing the means of equal financial power and majority financial power.

Group Statistics

	Q10_financial_p	N	Mean	Std. Deviation	Std. Error Mean
Turnover_ratio	Equal F Power	29	267,8498	535,40784	99,42274
	Majority F Power	22	418,5749	1027,63650	219,09284

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Turnover_ratio	Equal variances assumed	3,674	,061	-,679	49	,500	-150,72516	221,97490	-596,80043	295,35011
	Equal variances not assumed			-,626	29,598	,536	-150,72516	240,59624	-642,36814	340,91783

Table 38 – T-test comparing the means of minority financial power and majority financial power.

Group Statistics

	Q10_financial_p	N	Mean	Std. Deviation	Std. Error Mean
Turnover_ratio	Minority F Power	6	95,5712	104,66537	42,72946
	Majority F Power	22	418,5749	1027,63650	219,09284

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Turnover_ratio	Equal variances assumed	2,928	,099	-,758	26	,455	-323,00375	425,88291	-1198,41862	552,41111
	Equal variances not assumed			-1,447	22,491	,162	-323,00375	223,22069	-785,34961	139,34210

This t-test tested the difference between group 1: symmetric JVs and group 2: asymmetric JVs. The test showed mean differences in JV performance, goal congruence, and trust. However these mean differences are not significant. This is probably contributed to the fact that the group size of symmetric JVs is limited.

Table 39 – T-test symmetric and asymmetric JVs.

Group Statistics

	Symmetry	N	Mean	Std. Deviation	Std. Error Mean
Goal_Congruence	Symmetric JV	15	6,2000	1,55737	,40211
	Asymmetric JV	57	5,8480	1,71718	,22745
JV_Performance	Symmetric JV	15	5,1333	1,93157	,49873
	Asymmetric JV	57	4,8509	1,93641	,25648
Q9_trust	Symmetric JV	15	4,7333	1,62422	,41937
	Asymmetric JV	57	5,0351	1,72135	,22800
Q10_financial_p	Symmetric JV	15	2,0000	,53452	,13801
	Asymmetric JV	57	2,0351	,70622	,09354
Q11_control_p	Symmetric JV	15	2,1333	,51640	,13333
	Asymmetric JV	57	2,0175	,64063	,08485
Q12_expertise_p	Symmetric JV	15	2,0000	,53452	,13801
	Asymmetric JV	57	2,0351	,70622	,09354
Turnover_ratio	Symmetric JV	15	2,8494	1,25160	,32316
	Asymmetric JV	57	307,8898	742,15618	98,30099
TR_Log	Symmetric JV	15	,4073	,22026	,05687
	Asymmetric JV	57	1,6773	,83568	,11069
JV_Age	Symmetric JV	15	260,2000	129,34185	33,39592
	Asymmetric JV	57	222,7018	113,35484	15,01422

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Goal_Congruence	Equal variances assumed	1,536	,219	,719	70	,474	,35205	,48938	-,62400	1,32809
	Equal variances not assumed			,762	23,783	,454	,35205	,46198	-,60189	1,30599
JV_Performance	Equal variances assumed	,330	,567	,503	70	,617	,28246	,56165	-,83771	1,40263
	Equal variances not assumed			,504	22,000	,620	,28246	,56082	-,88060	1,44552
Q9_trust	Equal variances assumed	,002	,961	-,611	70	,543	-,30175	,49401	-1,28703	,68352
	Equal variances not assumed			-,632	22,997	,534	-,30175	,47734	-1,28922	,68571
Q10_financial_p	Equal variances assumed	2,992	,088	-,179	70	,858	-,03509	,19599	-,42598	,35580
	Equal variances not assumed			-,210	28,323	,835	-,03509	,16673	-,37644	,30626
Q11_control_p	Equal variances assumed	,246	,621	,646	70	,520	,11579	,17927	-,24176	,47334
	Equal variances not assumed			,733	26,548	,470	,11579	,15804	-,20875	,44033
Q12_expertise_p	Equal variances assumed	2,992	,088	-,179	70	,858	-,03509	,19599	-,42598	,35580
	Equal variances not assumed			-,210	28,323	,835	-,03509	,16673	-,37644	,30626
Turnover_ratio	Equal variances assumed	6,539	,013	-1,584	70	,118	-305,04038	192,62988	-689,22856	79,14779
	Equal variances not assumed			-3,103	56,001	,003	-305,04038	98,30152	-501,96189	-108,11887
TR_Log	Equal variances assumed	26,324	,000	-5,805	70	,000	-1,27000	,21878	-1,70634	-,83365
	Equal variances not assumed			-10,205	69,966	,000	-1,27000	,12444	-1,51819	-1,02180
JV_Age	Equal variances assumed	,956	,332	1,107	70	,272	37,49825	33,87322	-30,05977	105,05626
	Equal variances not assumed			1,024	20,027	,318	37,49825	36,61577	-38,87433	113,87082

This t-test tested the difference between group 1: JVs with power balances and group 2: JVs with power imbalances. The test showed significant mean differences in power (im)balance in expertise power in JV performance, Strategic direction changes, and goal congruence. The tests showed that there is no significant mean difference for power (im)balances in either financial or expertise power.

Table 40 - T-test power balance and imbalance in financial power.

Group Statistics

	Financialp	N	Mean	Std. Deviation	Std. Error Mean
Turnover_ratio	Imbalance	28	349,3598	917,39153	173,37070
	Balance	29	267,8498	535,40784	99,42274
JV_Performance	Imbalance	28	4,5714	2,09812	,39651
	Balance	29	5,1207	1,76096	,32700
SD_changed	Imbalance	28	1,5000	,50918	,09623
	Balance	29	1,6207	,49380	,09170
Goal_Congruence	Imbalance	28	5,8452	1,81553	,34310
	Balance	29	5,8506	1,64892	,30620
Q9_trust	Imbalance	28	4,6786	1,96362	,37109
	Balance	29	5,3793	1,39933	,25985
Q10_financial_p	Imbalance	28	2,0714	1,01575	,19196
	Balance	29	2,0000	,00000	,00000
Q11_control_p	Imbalance	28	2,0357	,79266	,14980
	Balance	29	2,0000	,46291	,08596
Q12_expertise_p	Imbalance	28	1,8929	,73733	,13934
	Balance	29	2,1724	,65841	,12226
JV_Age	Imbalance	28	223,3571	118,57369	22,40832
	Balance	29	222,0690	110,18262	20,46040

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Turnover_ratio	Equal variances assumed	1,676	,201	,411	55	,682	81,51007	198,10710	-315,50544	478,52558
	Equal variances not assumed			,408	43,176	,685	81,51007	199,85565	-321,48974	484,50987
JV_Performance	Equal variances assumed	2,256	,139	-1,072	55	,288	-,54926	,51236	-1,57606	,47754
	Equal variances not assumed			-1,069	52,707	,290	-,54926	,51395	-1,58026	,48173
SD_changed	Equal variances assumed	1,672	,201	-,908	55	,368	-,12069	,13285	-,38692	,14554
	Equal variances not assumed			-,908	54,759	,368	-,12069	,13292	-,38709	,14571
Goal_Congruence	Equal variances assumed	,021	,885	-,012	55	,991	-,00534	,45908	-,92535	,91468
	Equal variances not assumed			-,012	54,065	,991	-,00534	,45987	-,92729	,91661
Q9_trust	Equal variances assumed	4,222	,045	-1,556	55	,125	-,70074	,45039	-1,60334	,20186
	Equal variances not assumed			-1,547	48,683	,128	-,70074	,45302	-1,61127	,20979
Q10_financial_p	Equal variances assumed	5456,579	,000	,379	55	,706	,07143	,18856	-,30645	,44931
	Equal variances not assumed			,372	27,000	,713	,07143	,19196	-,32244	,46529
Q11_control_p	Equal variances assumed	12,190	,001	,209	55	,836	,03571	,17120	-,30738	,37881
	Equal variances not assumed			,207	43,193	,837	,03571	,17271	-,31254	,38397
Q12_expertise_p	Equal variances assumed	,287	,595	-1,511	55	,136	-,27956	,18500	-,65031	,09120
	Equal variances not assumed			-1,508	53,818	,137	-,27956	,18538	-,65124	,09213
JV_Age	Equal variances assumed	,071	,791	,043	55	,966	1,28818	30,30435	-59,44310	62,01946
	Equal variances not assumed			,042	54,355	,966	1,28818	30,34404	-59,53885	62,11520

Table 41 - T-test power balance and imbalance in control power.

Group Statistics

	Controlp	N	Mean	Std. Deviation	Std. Error Mean
Turnover_ratio	Imbalance	23	440,1638	996,02438	207,68544
	Balance	34	218,4103	502,85557	86,23902
JV_Performance	Imbalance	23	4,6087	1,95957	,40860
	Balance	34	5,0147	1,93252	,33142
SD_changed	Imbalance	23	1,5217	,51075	,10650
	Balance	34	1,5882	,49955	,08567
Goal_Congruence	Imbalance	23	5,5797	1,98534	,41397
	Balance	34	6,0294	1,51395	,25964
Q9_trust	Imbalance	23	4,6522	1,96813	,41038
	Balance	34	5,2941	1,50815	,25865
Q10_financial_p	Imbalance	23	1,9565	,87792	,18306
	Balance	34	2,0882	,57036	,09782
Q11_control_p	Imbalance	23	2,0435	1,02151	,21300
	Balance	34	2,0000	,00000	,00000
Q12_expertise_p	Imbalance	23	2,0435	,82453	,17193
	Balance	34	2,0294	,62694	,10752
JV_Age	Imbalance	23	224,9130	115,71121	24,12745
	Balance	34	221,2059	113,45985	19,45820

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Turnover_ratio	Equal variances assumed	4,402	,041	1,109	55	,272	221,75349	199,95847	-178,97224	622,47922
	Equal variances not assumed			,986	29,653	,332	221,75349	224,87866	-237,73550	681,24248
JV_Performance	Equal variances assumed	,045	,832	-,774	55	,442	-,40601	,52468	-1,45749	,64547
	Equal variances not assumed			-,772	46,929	,444	-,40601	,52611	-1,46446	,65244
SD_changed	Equal variances assumed	,604	,440	-,489	55	,627	-,06650	,13609	-,33922	,20623
	Equal variances not assumed			-,487	46,660	,629	-,06650	,13668	-,34152	,20853
Goal_Congruence	Equal variances assumed	2,119	,151	-,969	55	,337	-,44970	,46385	-1,37929	,47988
	Equal variances not assumed			-,920	38,718	,363	-,44970	,48866	-1,43834	,53893
Q9_trust	Equal variances assumed	1,889	,175	-1,393	55	,169	-,64194	,46088	-1,56557	,28168
	Equal variances not assumed			-1,323	38,861	,193	-,64194	,48509	-1,62324	,33935
Q10_financial_p	Equal variances assumed	10,495	,002	-,688	55	,495	-,13171	,19157	-,51563	,25220
	Equal variances not assumed			-,635	34,482	,530	-,13171	,20755	-,55330	,28987
Q11_control_p	Equal variances assumed	17322,105	,000	,249	55	,804	,04348	,17442	-,30607	,39303
	Equal variances not assumed			,204	22,000	,840	,04348	,21300	-,39825	,48521
Q12_expertise_p	Equal variances assumed	4,328	,042	,073	55	,942	,01407	,19238	-,37148	,39961
	Equal variances not assumed			,069	38,634	,945	,01407	,20278	-,39621	,42435
JV_Age	Equal variances assumed	,000	,996	,120	55	,905	3,70716	30,87663	-58,17099	65,58531
	Equal variances not assumed			,120	46,742	,905	3,70716	30,99606	-58,65795	66,07227

Table 42 - T-test power balance and imbalance in expertise power.

Group Statistics

	Expertisep	N	Mean	Std. Deviation	Std. Error Mean
Turnover_ratio	Imbalance	28	381,0452	857,69805	162,08970
	Balance	29	237,2570	617,81861	114,72604
JV_Performance	Imbalance	28	4,2321	1,98831	,37576
	Balance	29	5,4483	1,71311	,31812
SD_changed	Imbalance	28	1,3571	,48795	,09221
	Balance	29	1,7586	,43549	,08087
Goal_Congruence	Imbalance	28	5,2262	1,82812	,34548
	Balance	29	6,4483	1,38379	,25696
Q9_trust	Imbalance	28	4,6071	1,77094	,33468
	Balance	29	5,4483	1,59432	,29606
Q10_financial_p	Imbalance	28	1,9643	,74447	,14069
	Balance	29	2,1034	,67320	,12501
Q11_control_p	Imbalance	28	2,0357	,74447	,14069
	Balance	29	2,0000	,53452	,09926
Q12_expertise_p	Imbalance	28	2,0714	1,01575	,19196
	Balance	29	2,0000	,00000	,00000
JV_Age	Imbalance	28	222,3929	111,67292	21,10420
	Balance	29	223,0000	116,93160	21,71365

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Turnover_ratio	Equal variances assumed	2,571	,115	,728	55	,470	143,78817	197,46218	-251,93489	539,51122
	Equal variances not assumed			,724	48,976	,472	143,78817	198,58281	-255,28387	542,86020
JV_Performance	Equal variances assumed	2,269	,138	-2,477	55	,016	-1,21613	,49103	-2,20018	-,23208
	Equal variances not assumed			-2,470	53,214	,017	-1,21613	,49233	-2,20353	-,22874
SD_changed	Equal variances assumed	3,480	,067	-3,280	55	,002	-,40148	,12240	-,64678	-,15618
	Equal variances not assumed			-3,273	53,810	,002	-,40148	,12265	-,64740	-,15556
Goal_Congruence	Equal variances assumed	6,170	,016	-2,852	55	,006	-1,22209	,42848	-2,08079	-,36338
	Equal variances not assumed			-2,838	50,294	,007	-1,22209	,43057	-2,08678	-,35739
Q9_trust	Equal variances assumed	1,033	,314	-1,886	55	,065	-,84113	,44600	-1,73493	,05267
	Equal variances not assumed			-1,882	53,940	,065	-,84113	,44683	-1,73700	,05474
Q10_financial_p	Equal variances assumed	,207	,651	-,741	55	,462	-,13916	,18787	-,51566	,23734
	Equal variances not assumed			-,739	54,004	,463	-,13916	,18821	-,51649	,23817
Q11_control_p	Equal variances assumed	4,840	,032	,209	55	,836	,03571	,17120	-,30738	,37881
	Equal variances not assumed			,207	48,888	,837	,03571	,17218	-,31032	,38174
Q12_expertise_p	Equal variances assumed	5456,579	,000	,379	55	,706	,07143	,18856	-,30645	,44931
	Equal variances not assumed			,372	27,000	,713	,07143	,19196	-,32244	,46529
JV_Age	Equal variances assumed	,054	,818	-,020	55	,984	-,60714	30,30474	-61,33920	60,12491
	Equal variances not assumed			-,020	54,994	,984	-,60714	30,27986	-61,28948	60,07520

ANNEX IX.I – FULL MODEL

To calculate the standardised coefficients multiple regression analyses were conducted:

Table 43 – Path analysis. Full model – financial power.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,263[a]	,069	,035	,69393

a. Predictors: (Constant), Q12_expertise_p, Turnover_ratio

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,804	,294		6,132	,000
	Turnover_ratio	,000	,000	,264	1,984	,052
	Q12_expertise_p	,075	,133	,075	,567	,573

a. Dependent Variable: Q10_financial_p

Table 44 – Path analysis. Full model – trust.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,675[a]	,456	,403	1,33012

a. Predictors: (Constant), Goal_Congruence, Q12_expertise_p, Q10_financial_p, Turnover_ratio, Q11_control_p

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,354	1,107		2,128	,038
	Turnover_ratio	2,142E-5	,000	,009	,081	,936
	Q12_expertise_p	,556	,266	,228	2,090	,042
	Q10_financial_p	,354	,310	,145	1,144	,258
	Q11_control_p	-,989	,355	-,368	-2,788	,007
	Goal_Congruence	,482	,118	,480	4,072	,000

a. Dependent Variable: Q9_trust

Table 45 – Path analysis. Full model – goal congruence.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,484[a]	,234	,175	1,55959

a. Predictors: (Constant), Q11_control_p, Turnover_ratio, Q12_expertise_p, Q10_financial_p

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6,683	,908		7,361	,000
	Turnover_ratio	-,001	,000	-,283	-2,221	,031
	Q12_expertise_p	,028	,312	,012	,090	,929
	Q10_financial_p	,902	,341	,371	2,645	,011
	Q11_control_p	-1,252	,378	-,467	-3,314	,002

a. Dependent Variable: Goal_Congruence

Table 46 – Path analysis. Full model – control power.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,509[a]	,259	,217	,56695

a. Predictors: (Constant), Q10_financial_p, Q12_expertise_p, Turnover_ratio

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,759	,313		2,425	,019
	Turnover_ratio	-5,353E-5	,000	-,062	-,500	,619
	Q12_expertise_p	,227	,109	,250	2,084	,042
	Q10_financial_p	,399	,111	,440	3,590	,001

a. Dependent Variable: Q11_control_p

Table 47 – Path analysis. Full model – JV Performance.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,725[a]	,526	,469	1,41085

a. Predictors: (Constant), Q9_trust, Q10_financial_p, Q12_expertise_p, Turnover_ratio, Goal_Congruence, Q11_control_p

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,260	1,225		2,662	,010
	Turnover_ratio	,000	,000	-,157	-1,469	,148
	Q10_financial_p	,359	,333	,131	1,080	,285
	Q11_control_p	-,620	,404	-,205	-1,534	,131
	Q12_expertise_p	-,414	,294	-,151	-1,407	,166
	Goal_Congruence	-,097	,144	-,086	-,673	,504
	Q9_trust	,724	,149	,644	4,875	,000

a. Dependent Variable: JV_Performance

Multiple regression analyses were conducted to calculate the β in simple mediation models.

Table 48 – Path analysis. Mediation – X1Y3.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,804	,294		6,132	,000
	Turnover_ratio	,000	,000	,264	1,984	,052
	Q12_expertise_p	,075	,133	,075	,567	,573

a. Dependent Variable: Q10_financial_p

Table 49 – Path analysis. Mediation – Y6Y7 (1).

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,505	1,056		2,372	,021
	Q11_control_p	-,541	,320	-,179	-1,689	,097
	Q9_trust	,683	,119	,607	5,725	,000

a. Dependent Variable: JV_Performance

Table 50 – Path analysis. Mediation - Y6Y7 (2).

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4,741	1,281		3,702	,001
	Q11_control_p	-,967	,371	-,320	-2,602	,012
	Goal_Congruence	,352	,139	,312	2,542	,014

a. Dependent Variable: JV_Performance

Table 51 – Path analysis. Mediation – Y5Y7.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,970	,722		1,343	,185
	Goal_Congruence	,017	,140	,015	,120	,905
	Q9_trust	,751	,140	,668	5,373	,000

a. Dependent Variable: JV_Performance

The standardised coefficients had to be determined again for the trimmed model

Table 52 – Path analysis. Trimmed model – trust.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,631ᵃ	,398	,376	1,35997

a. Predictors: (Constant), Q11_control_p, Goal_Congruence

Coefficientsᵃ

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,222	1,027		3,136	,003
	Goal_Congruence	,523	,111	,522	4,704	,000
	Q11_control_p	-,617	,298	-,230	-2,071	,043

a. Dependent Variable: Q9_trust

Table 53 – Path analysis. Trimmed model – goal congruence.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,484ᵃ	,234	,191	1,54492

a. Predictors: (Constant), Q11_control_p, Turnover_ratio, Q10_financial_p

Coefficientsᵃ

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6,726	,765		8,788	,000
	Turnover_ratio	-,001	,000	-,285	-2,280	,027
	Q10_financial_p	,900	,337	,370	2,669	,010
	Q11_control_p	-1,243	,360	-,464	-3,454	,001

a. Dependent Variable: Goal_Congruence

Table 54 – Path analysis. Trimmed model – control power.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,505ᵃ	,255	,228	,56300

a. Predictors: (Constant), Q12_expertise_p, Q10_financial_p

Coefficientsᵃ

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,753	,311		2,424	,019
	Q10_financial_p	,385	,107	,424	3,609	,001
	Q12_expertise_p	,237	,107	,261	2,219	,031

a. Dependent Variable: Q11_control_p

Table 55 – Path analysis. Trimmed model – JV performance.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,677[a]	,458	,438	1,45182

a. Predictors: (Constant), Goal_Congruence, Q9_trust

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,970	,722		1,343	,185
	Q9_trust	,751	,140	,668	5,373	,000
	Goal_Congruence	,017	,140	,015	,120	,905

a. Dependent Variable: JV_Performance

ANNEX IX.IV – TRIMMED MODEL 2

Because two paths were deleted in the trimmed model, again the standardised coefficients had to be determined.

Table 56 – Path analysis. Trimmed model 2 – control power.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,505[a]	,255	,228	,56300

a. Predictors: (Constant), Q10_financial_p, Q12_expertise_p

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,753	,311		2,424	,019
	Q12_expertise_p	,237	,107	,261	2,219	,031
	Q10_financial_p	,385	,107	,424	3,609	,001

a. Dependent Variable: Q11_control_p

Table 57 – Path analysis. Trimmed model 2 – trust.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,631[a]	,398	,376	1,35997

a. Predictors: (Constant), Goal_Congruence, Q11_control_p

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,222	1,027		3,136	,003
	Q11_control_p	-,617	,298	-,230	-2,071	,043
	Goal_Congruence	,523	,111	,522	4,704	,000

a. Dependent Variable: Q9_trust

Table 58 – Path analysis. Trimmed model 2 – goal congruence.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,306ª	,094	,077	1,64963

a. Predictors: (Constant), Q11_control_p

Coefficientsª

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7,503	,728		10,308	,000
	Q11_control_p	-,820	,344	-,306	-2,383	,021

a. Dependent Variable: Goal_Congruence

Table 59 – Path analysis. Trimmed model 2 – JV performance.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,677ª	,458	,438	1,45182

a. Predictors: (Constant), Q9_trust, Goal_Congruence

Coefficientsª

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,970	,722		1,343	,185
	Goal_Congruence	,017	,140	,015	,120	,905
	Q9_trust	,751	,140	,668	5,373	,000

a. Dependent Variable: JV_Performance

This annex shows the output of the multiple regression to predict JV performance.

ANNEX X.I - FIRST REGRESSION MODEL

Table 60 – Model summary of multiple regression analysis – JV performance.

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	,677[a]	,458	,448	1,43875	,458	46,441	1	55	,000	
2	,677[b]	,458	,438	1,45182	,000	,014	1	54	,905	1,916

a. Predictors: (Constant), Q9_trust

b. Predictors: (Constant), Q9_trust, Goal_Congruence

c. Dependent Variable: JV_Performance

Table 61 - ANOVA of multiple regression analysis – JV performance.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	96,132	1	96,132	46,441	,000[b]
	Residual	113,850	55	2,070		
	Total	209,982	56			
2	Regression	96,163	2	48,081	22,811	,000[c]
	Residual	113,820	54	2,108		
	Total	209,982	56			

a. Dependent Variable: JV_Performance

b. Predictors: (Constant), Q9_trust

c. Predictors: (Constant), Q9_trust, Goal_Congruence

Table 62 – Coefficients of multiple regression analysis – JV performance.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1,018	,594		1,715	,092	-,172	2,208					
	Q9_trust	,761	,112	,677	6,815	,000	,537	,985	,677	,677	,677	1,000	1,000
2	(Constant)	,970	,722		1,343	,185	-,478	2,418					
	Q9_trust	,751	,140	,668	5,373	,000	,471	1,032	,677	,590	,538	,650	1,539
	Goal_Congruence	,017	,140	,015	,120	,905	-,264	,298	,410	,016	,012	,650	1,539

a. Dependent Variable: JV_Performance

ANNEX X.II - EXTREME CASES

Because the regression analysis failed to make significant relationships to predict the outcome of the dependent variable, the following part will focus on extreme cases influencing the regression model. Table 63 shows the residual statistics that there are four cases that should be assessed for extreme cases. An ordinal sample without extreme cases should have 95% of the subjects to have standardised residuals of ±2,0. The table below shows that there are four subjects outside this interval which is 7,0%. Therefore, the assumption of an ordinal data is violated, since 93% of the standardised residuals is within ±2,0. Because this assumption is violated, these four cases will be reviewed whether they should be removed from the sample or not.

Table 63 – Casewise diagnostics of multiple regression analysis – JV performance.

Casewise Diagnostics[a]

Case Number	Std. Residual	JV_Performance	Predicted Value	Residual
28	-2,465	2,00	5,5783	-3,57830
33	-2,305	3,00	6,3463	-3,34634
57	-2,119	1,00	4,0758	-3,07584
73	-2,095	1,00	4,0422	-3,04223

a. Dependent Variable: JV_Performance

To further assess the extreme cases in this regression model, various statistics are used to assess influencing cases (Field, 2009);

- *Cook's Distance* is used to measure the influence of one case on the whole model and should be below 1,0 if the case is not significantly influencing the whole model. The maximum value is 0,128 and thus satisfies the criterion (Table 64).
- *Centred Leverage Value* measures the effect of the influence of the dependent variable over the independent variables. The average leverage is (k+1)/n in which k resembles the total number of independent variables and n the sample size. Extreme cases should be assessed when it is twice the value of the average leverage. In this case the average leverage is 0,05 (k = 2, n = 57). The maximum leverage value is 0,155 and thus does not satisfy the criterion *(0,155 > 2 * 0,05, Table 64)*.
- *Mahalanobis Distance* measures the distance of the extreme cases from the mean of the independent variables and should be less than 11,0 when N = 30. The maximum Mahalanobis distance is 8,67 which is below 11,0, and thus meets the criterion (Table 64).

Table 64 – Residual statistics of multiple regression analysis – JV performance.

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1,7381	6,3463	4,8509	1,31042	57
Std. Predicted Value	-2,375	1,141	,000	1,000	57
Standard Error of Predicted Value	,194	,603	,315	,109	57
Adjusted Predicted Value	1,5795	6,4887	4,8553	1,31005	57
Residual	-3,57830	2,65858	,00000	1,42566	57
Std. Residual	-2,465	1,831	,000	,982	57
Stud. Residual	-2,496	1,924	-,001	1,007	57
Deleted Residual	-3,66923	2,93486	-,00443	1,49929	57
Stud. Deleted Residual	-2,629	1,975	-,008	1,028	57
Mahal. Distance	,016	8,668	1,965	2,295	57
Cook's Distance	,000	,128	,017	,027	57
Centered Leverage Value	,000	,155	,035	,041	57

a. Dependent Variable: JV_Performance

All the influence statistic values seem to be within the criteria, and thus the cases identified in Table 63 are not influencing the regression model significantly. Next, the DFBeta statistic is assessed to assess the influence of each case on the regression itself. None of these values are greater than 1,0, by which is satisfies the criterion (Table 65).

Case Summaries

		Case Number	Standardized DFBETA Intercept	Standardized DFBETA Q9_trust	Standardized DFBETA Goal_Congruence	Standardized DFFIT	COVRATIO
1		28	,00291	-,22427	,10735	-,41906	,75086
2		33	,21152	-,31014	,00197	-,50768	,79699
3		57	-,12959	,24511	-,16664	-,38798	,83306
4		73	-,37239	-,01332	,26939	-,44128	,84373
Total	N	4	4	4	4	4	4

Finally the upper and lower limit of the covariance ratio (COVRATIO) is calculated. These values represent the values in which the COVRATIO is acceptable.

$$COVRATIO_{upper} = 1 + 3 * average\ leverage = 1 + 3 * 0,05 = 1,15$$
$$COVRATIO_{lower} = 1 - 3 * average\ leverage = 1 + 3 * 0,05 = 0,85$$

The criteria for the COVRATIO is not met for all the four extreme cases (Table 65). Because this criterion is not met and not all cases represent the 95% standardised residuals, these cases are to be deleted from the regression model.

ANNEX X.III   - UPDATED REGRESSION MODEL

The table below shows the output of the SPSS analysis to predict JV performance. This analysis was done without the identified extreme cases.

Table 66 – Model summary of multiple regression analysis – JV performance (without extreme values).

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	,769[a]	,592	,584	1,15231	,592	73,917	1	51	,000	
2	,769[b]	,592	,576	1,16362	,000	,014	1	50	,908	2,159

a. Predictors: (Constant), Q9_trust

b. Predictors: (Constant), Q9_trust, Goal_Congruence

c. Dependent Variable: JV_Performance

Table 67- ANOVA table – JV performance (without extreme values).

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	98,149	1	98,149	73,917	,000[b]
	Residual	67,719	51	1,328		
	Total	165,868	52			
2	Regression	98,167	2	49,084	36,250	,000[c]
	Residual	67,701	50	1,354		
	Total	165,868	52			

a. Dependent Variable: JV_Performance

b. Predictors: (Constant), Q9_trust

c. Predictors: (Constant), Q9_trust, Goal_Congruence

Table 68- Coefficients of multiple regression analysis – JV performance (without extreme values).

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1,141	,485		2,352	,023	,167	2,116					
	Q9_trust	,786	,091	,769	8,597	,000	,602	,969	,769	,769	,769	1,000	1,000
2	(Constant)	1,180	,590		2,000	,051	-,005	2,365					
	Q9_trust	,794	,114	,777	6,958	,000	,564	1,023	,769	,701	,629	,655	1,527
	Goal_Congruence	-,013	,114	-,013	-,117	,908	-,241	,215	,443	-,017	-,011	,655	1,527

a. Dependent Variable: JV_Performance

This annex shows the output given by the PROCESS add-in (Hayes, 2017). The required data is highlighted.

ANNEX XI.I – MEDIATIOR TRUST

```
Run MATRIX procedure:


************** PROCESS Procedure for SPSS Release 2.16.3 ******************


        Written by Andrew F. Hayes, Ph.D.        www.afhayes.com
    Documentation available in Hayes (2013). www.guilford.com/p/hayes3


**************************************************************************
Model = 4
    Y = JV_Perf
    X = Goal_Con
    M = Q9_trust


Sample size
        57


**************************************************************************
Outcome: Q9_trust


Model Summary
        R         R-sq       MSE          F          df1        df2          p
     ,5919      ,3503     1,9601     30,4399     1,0000     55,0000      ,0000


Model
          coeff       se         t          p        LLCI       ULCI
constant   1,5655     ,6646     2,3555     ,0221      ,2336     2,8973
Goal_Con    ,5933     ,1075     5,5172     ,0000      ,3778      ,8088
            a-path
**************************************************************************
Outcome: JV_Perf


Model Summary
        R         R-sq       MSE          F          df1        df2          p
     ,6767      ,4580     2,1078     24,5899     2,0000     54,0000      ,0000
```

Model

	coeff	se	t	p	LLCI	ULCI
constant	,9701	,6435	1,5075	,1375	-,3200	2,2602
Q9_trust	,7512	,1543	4,8696	,0000	,4419	1,0605
	b-path					
Goal_Con	,0168	,1339	,1256	,9005	-,2516	,2852
	c'-path					

************************* TOTAL EFFECT MODEL ***************************

Outcome: JV_Perf

Model Summary

R	R-sq	MSE	F	df1	df2	p
,4102	,1682	3,1756	18,0095	1,0000	55,0000	,0001

Model

	coeff	se	t	p	LLCI	ULCI
constant	2,1461	,6401	3,3527	,0015	,8633	3,4289
Goal_Con	,4625	,1090	4,2438	,0001	,2441	,6809
	c-path					

***************** TOTAL, DIRECT, AND INDIRECT EFFECTS ********************

Total effect of X on Y

Effect	SE	t	p	LLCI	ULCI
,4625	,1090	4,2438	,0001	,2441	,6809

Direct effect of X on Y

Effect	SE	t	p	LLCI	ULCI
,0168	,1339	,1256	,9005	-,2516	,2852

Indirect effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI	
Q9_trust	,4457	,1110	,2502	,6986	**indirect effect (a*b)**

Partially standardized indirect effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI
Q9_trust	,2302	,0529	,1352	,3455

Completely standardized indirect effect of X on Y

	Effect	Boot SE	BootLLCI	BootULCI	
Q9_trust	,3952	,1040	,2170	,6291	**Effect size 1: ab_cs**

Ratio of indirect to total effect of X on Y

```
              Effect    Boot SE   BootLLCI   BootULCI
Q9_trust      ,9637      ,5630      ,4868     1,8648
```

Effect size 2: P_M

Ratio of indirect to direct effect of X on Y

```
              Effect    Boot SE   BootLLCI   BootULCI
Q9_trust     26,5149   245,6086   16,2824   2635,7183
```

R-squared mediation effect size (R-sq_med)

```
              Effect    Boot SE   BootLLCI   BootULCI
Q9_trust      ,1681      ,0887      ,0236      ,3781
```

Normal theory tests for indirect effect

```
     Effect        se         Z          p
      ,4457      ,1232     3,6177      ,0003
```

******************** ANALYSIS NOTES AND WARNINGS ************************

Number of bootstrap samples for bias corrected bootstrap confidence intervals:
     5000

Level of confidence for all confidence intervals in output:
     95,00

NOTE: All standard errors for continuous outcome models are based on the HC3
estimator

NOTE: Kappa-squared is disabled from output as of version 2.16.

------ END MATRIX -----

ANNEX XI.II - MEDIATOR GOAL CONGRUENCE

Run MATRIX procedure:

************* PROCESS Procedure for SPSS Release 2.16.3 ******************

          Written by Andrew F. Hayes, Ph.D.   www.afhayes.com
     Documentation available in Hayes (2013). www.guilford.com/p/hayes3

****
Model = 4

```
    Y = trust

    X = control

    M = Goal_Con
```

Sample size
         57

```
**************************************************************************
Outcome: Goal_Con
```

Model Summary
```
         R       R-sq       MSE         F        df1        df2          p
     ,3060      ,0936     2,7213     4,4001     1,0000    55,0000      ,0405
```

Model
```
              coeff        se          t          p        LLCI        ULCI
constant    7,5025      ,7092    10,5785      ,0000      6,0812      8,9239
control     -,8201      ,3910    -2,0976      ,0405     -1,6036      -,0366
```

```
**************************************************************************
Outcome: trust
```

Model Summary
```
         R       R-sq       MSE         F        df1        df2          p
     ,6310      ,3981     1,8495    16,2535     2,0000    54,0000      ,0000
```

Model
```
              coeff        se          t          p        LLCI        ULCI
constant    3,2221     1,0081     3,1961      ,0023      1,2009      5,2433
Goal_Con     ,5229      ,1112     4,7017      ,0000       ,2999       ,7459
control     -,6170      ,3355    -1,8387      ,0715     -1,2897       ,0557
```

```
************************* TOTAL EFFECT MODEL **************************
Outcome: trust
```

Model Summary
```
         R       R-sq       MSE         F        df1        df2          p
     ,3892      ,1515     2,5599     8,1589     1,0000    55,0000      ,0060
```

Model
```
              coeff        se          t          p        LLCI        ULCI
constant    7,1450      ,6887    10,3743      ,0000      5,7648      8,5253
```

```
control         -1,0458    ,3661    -2,8564    ,0060  -1,7795    -,3121


***************** TOTAL, DIRECT, AND INDIRECT EFFECTS ********************


Total effect of X on Y
     Effect        SE        t          p       LLCI       ULCI
   -1,0458     ,3661   -2,8564     ,0060   -1,7795     -,3121


Direct effect of X on Y
     Effect        SE        t          p       LLCI       ULCI
    -,6170     ,3355   -1,8387     ,0715   -1,2897      ,0557


Indirect effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Goal_Con    -,4288      ,2331     -,9983     -,0749


Partially standardized indirect effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Goal_Con    -,2491      ,1271     -,5415     -,0422


Completely standardized indirect effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Goal_Con    -,1596      ,0798     -,3408     -,0284


Ratio of indirect to total effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Goal_Con     ,4100      ,3176      ,0890     1,0716


Ratio of indirect to direct effect of X on Y
            Effect    Boot SE   BootLLCI   BootULCI
Goal_Con     ,6950    42,8182      ,0361     8,7089


R-squared mediation effect size (R-sq_med)
            Effect    Boot SE   BootLLCI   BootULCI
Goal_Con     ,1037      ,0615      ,0134      ,2588


Normal theory tests for indirect effect
     Effect        se        Z          p
    -,4288     ,2280   -1,8805     ,0600


******************** ANALYSIS NOTES AND WARNINGS ************************
```

```
Number of bootstrap samples for bias corrected bootstrap confidence intervals:
     5000


Level of confidence for all confidence intervals in output:
     95,00


NOTE: All standard errors for continuous outcome models are based on the HC3
estimator


NOTE: Kappa-squared is disabled from output as of version 2.16.


------ END MATRIX -----
```

The output below shows that de moderator was found to be significant in the multiple regression analysis.

Table 69 – Model summary of multiple regression analysis – moderator.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,819[a]	,670	,651	1,01394

a. Predictors: (Constant), Q11Control_QSO, QSO_centr, Q11Control_centr

Table 70– Coefficients table of multiple regression analysis – moderator.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	5,899	,136		43,482	,000		
	Q11Control_centr	-,500	,214	-,186	-2,333	,023	,975	1,025
	QSO_centr	2,510	,274	,732	9,176	,000	,979	1,021
	Q11Control_QSO	1,139	,428	,211	2,661	,010	,994	1,006

a. Dependent Variable: Goal_Congruence

Before control power is predicted with a multiple regression analysis, it is controlled for extreme cases.

Table 71 – Covariance ratio for multiple regression model – control power.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
COVRATIO	57	,83027	1,15982	1,0564831	,06982249
Valid N (listwise)	57				

Table 72 - Residuals statistics for multiple regression model - control power.

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1,3745	2,6170	2,0175	,32365	57
Std. Predicted Value	-1,987	1,852	,000	1,000	57
Standard Error of Predicted Value	,075	,171	,124	,035	57
Adjusted Predicted Value	1,3112	2,6722	2,0159	,32688	57
Residual	-1,23231	1,15240	,00000	,55286	57
Std. Residual	-2,189	2,047	,000	,982	57
Stud. Residual	-2,247	2,148	,001	1,017	57
Deleted Residual	-1,29859	1,26875	,00161	,59288	57
Stud. Deleted Residual	-2,338	2,225	,002	1,034	57
Mahal. Distance	,005	4,158	1,965	1,510	57
Cook's Distance	,000	,155	,025	,038	57
Centered Leverage Value	,000	,074	,035	,027	57

a. Dependent Variable: Q11_control_p

The analysis included two extreme cases which were deleted in the following analysis.

Table 73 – Model summary of multiple regression analysis – control power.

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	,451[a]	,203	,188	,57417	,203	13,513	1	53	,001	
2	,541[b]	,293	,266	,54598	,090	6,613	1	52	,013	1,475

a. Predictors: (Constant), Q10_financial_p

b. Predictors: (Constant), Q10_financial_p, Q12_expertise_p

c. Dependent Variable: Q11_control_p

Table 74 – ANOVA of multiple regression analysis – control power.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4,455	1	4,455	13,513	,001[b]
	Residual	17,472	53	,330		
	Total	21,927	54			
2	Regression	6,426	2	3,213	10,779	,000[c]
	Residual	15,501	52	,298		
	Total	21,927	54			

a. Dependent Variable: Q11_control_p

b. Predictors: (Constant), Q10_financial_p

c. Predictors: (Constant), Q10_financial_p, Q12_expertise_p

Table 75 – Coefficients table of multiple regression analysis – control power.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1,216	,236		5,151	,000					
	Q10_financial_p	,406	,111	,451	3,676	,001	,451	,451	,451	1,000	1,000
2	(Constant)	,694	,303		2,291	,026					
	Q10_financial_p	,386	,105	,428	3,664	,001	,451	,453	,427	,994	1,006
	Q12_expertise_p	,277	,108	,301	2,572	,013	,332	,336	,300	,994	1,006

a. Dependent Variable: Q11_control_p