Channel Governance through Brand Equity: How Brand Equity Shapes Distribution Channel Structure

Mohammad B. Kayed*
Assistant Professor of Marketing and Entrepreneurship
Williams School of Business, Bishop's University
2600 Rue College, Sherbrooke, QC, J1M 1Z7, Canada
Telephone: +1 819 822 9600
Email: mkayed@ubishops.ca

Manish Kacker
Associate Professor, Marketing
DeGroote School of Business, McMaster University
1280 Main St. W. Hamilton, ON, L8S 4M4, Canada
Telephone: +1 905 525 9140, ext. 21658
Email: mkacker@mcmaster.ca

Ruhai Wu
Associate Professor, Marketing
DeGroote School of Business, McMaster University
1280 Main St. W. Hamilton, ON, L8S 4M4, Canada
Telephone: +1 905 525 9140
Email: wuruhai@mcmaster.ca

Farhad Sadeh
Assistant Professor, Marketing
Eastern Illinois University
600 Lincoln Avenue Charleston, IL 61920-3099
Telephone: +1 +1 217 581 5000
Email: fsadeh@eiu.edu

Keywords: *distribution channel governance, vertical integration, brand equity, marketing strategy, distribution channel structure, vector autoregression.*

Acknowledgments: *The authors are thankful for the valuable feedback provided by Rob Palmatier, Venky Shankar, and the participants in the 7th Theory + Practice in Marketing (TPM) Conference, the 2018 AMA Winter Academic Conference, the 2018 European Marketing Academy (EMAC) Conference, the 2018 ISBM Academic Conference, and other conferences and seminars. Mohammad B. Kayed and Manish Kacker gratefully acknowledge funding from the Social Sciences and Humanities Research Council (SSHRC) of Canada. Additional funding for this Research was provided by the Institute for the Study of Business Markets (ISBM) at Penn State. However, the contents of this research reflect the views of the researchers who are solely responsible for the facts and the accuracy of the data presented herein.*

* *Corresponding author*

Channel Governance through Brand Equity: How Brand Equity Shapes Distribution Channel Structure

Abstract

The relationship between brand equity and channel governance is recognized in practice and is of particular interest to senior managers. However, research in marketing on this topic is limited and practitioners and scholars seem divided on the nature of this relationship. To guide practice and enrich scholarship on this issue, we investigate the causal impact of brand equity on channel governance. We advance a theoretical framework and estimate a Bayesian Panel Vector Autoregression, on a large panel data set (n=6,292) covering 44 sectors. Our results reveal that brand equity has a direct, powerful, but lagging impact on channel governance such that higher brand equity leads to a less hierarchical channel governance structure. Furthermore, reverse causality analysis suggests that this effect is more powerful, pronounced, and persistent than the reverse effect. We contribute to three literature streams and provide actionable managerial insights, primarily in the areas of channel governance and capital allocation decision-making.

Keywords: distribution channel governance, vertical integration, brand equity, marketing strategy, distribution channel structure, vector autoregression.

> "...[we take] vertical integration to the extreme…We prefer to train all our own people and operate all our own stores, so that each cup of coffee you buy from Starbucks is the real thing.*"*
>
> *(H. Schultz, Starbucks CEO, 1997)*

> "…vertical integration successfully created coordination, allowing Pepsi and Coke to build their brands. Once brand equity was firmly established, Coke and later Pepsi realized they no longer needed to [vertically integrate]."
>
> *(Coughlan, Anderson, Stern, & El-Ansary, 2006, p.354)*

INTRODUCTION

Brand equity – the differential value added by the brand name to a product in comparison with an unbranded duplicate (Yoo, Donthu, & Lee, 2000) – is a central concept in marketing theory and practice. It is a vital market-based asset that benefits the firm at various stakeholder levels such as customers (Keller, 2003; Wilson, Giebelhausen, & Brady, 2017), employees (Tavassoli, Sorescu, & Chandy, 2014), distributors (Fader & Schmittlein, 1993; Montgomery, 1975), and shareholders (Shankar, Azar, & Fuller, 2008). As a result, the role brand equity plays in marketing strategy is not only a *focal* one that shapes the firm's overall marketing strategy, but also a *multifaceted* one that influences how the firm approaches other elements of marketing strategy. Marketing scholars have extensively researched this multidimensional role and explained how brand equity influences a firm's product (e.g., DelVecchio & Smith, 2005;

Sinapuelas, Wang, & Bohlmann, 2015), price (e.g., Ailawadi, Lehmann, & Neslin, 2003; Taylor & Bearden, 2002), and promotion (e.g., Keller, 1993; Mazodier & Merunka, 2012) strategies. Interestingly, the influence of brand equity on another primary element of marketing strategy, *distribution strategy*, has not received commensurate research attention in marketing. Indeed, the influence of brand equity on distribution, as a general phenomenon, is still a relatively underresearched topic in marketing despite practitioners' and scholars' recognition of the crucial role brands play in distribution channels. Hoeffler and Keller (2003) conduct a review of the literature on the impact of brand equity on various elements of marketing strategy and conclude that the effect of brand equity on channel strategies and tactics appears to be the most neglected research area in this literature. In their review, they document only three studies that examine the impact of brand equity on distribution, none of which is on distribution channel governance. Our current survey of marketing literature reveals a few additional studies that examine the impact of brand equity on distribution but still no empirical work on the impact of brand equity on distribution channel governance. This study, which to the best of our knowledge is the first study in marketing that investigates the influence of brand equity on distribution channel governance, is an initial effort to attend to this research imperative. Table 1 presents a summary of existing marketing research on the impact of brand equity on distribution and illustrates the positioning of our contribution within this limited body of research.

[Insert Table 1 about here]

Managerial Relevance and Importance to Practice

On the managerial front, our inquiry is of particular interest to senior managers for a number of reasons. First, as evident in the opening quotes, practice seems divided on whether higher brand equity calls for more forward vertical integration (a more hierarchical channel

governance structure) or diffuses pressures for doing so. Hence, more scholarly work on the topic would be useful in guiding practice in making better strategic decisions. Second, senior corporate executives often find themselves dealing with a capital allocation conundrum where different marketing strategies (e.g., invest in acquiring downstream channel members vs. invest in strengthening the brand) compete for financial resources. Remarkably, whereas "gaining organization support and resources for brand building activities is often difficult, even with a consensus that brands are strategically important to the organization," (Biel & Aaker, 1993, p.333) the desire for control compels many executives to pursue vertical integration, even though it is a costly, risky investment that demands large resource commitments that often outweigh the foreseeable gains of such a venture (Bateman, 2016; Hitt, Harrison, & Ireland, 2001). Therefore, a better understanding of the relationship between brand equity and vertical integration, and whether these two strategic controls are substitutable, would help senior corporate executives in making superior capital allocation decisions. Third, despite falling from grace as a distribution strategy in the past three decades, vertical integration is witnessing a renewed interest from practice (Bateman, 2016; Economist, 2016). "It seems to be making a comeback… [and] it's been given a new label … the "full stack" business model. Some companies are migrating upstream: Take Netflix and Amazon … Others are integrating downstream. Consider Apple ... and Google … Some companies are even doing both. Tesla, for instance ..." (Favaro, 2015). This has led some practitioners to believe that "the pendulum has shifted from disintegration to integration" (Worthen & Scheck, 2009). This is surprising considering that (a) companies' track record of vertical integration had been "ugly" (Rumelt, 1974); (b) recent business memory is still replete with unsuccessful vertical integration adventures by prominent brand names (e.g., Google acquiring Motorola Mobility in 2011, Bank of America buying Countrywide in 2008, Allianz

owning Dresdner in 2001, AOL purchasing Time Warner in 2000, Merck buying Medco in 1990); and (c) financial markets have developed a habit of harshly punishing vertical integration ventures from their commencement (Moeller, Schlingemann, & Stulz, 2005). Against this backdrop, we examine the impact of brand equity on channel governance to provide practitioners with additional insights on the factors to consider before taking the resource-intensive vertical integration decision.

Study Overview

On the theoretical front, we draw on the theory of self-enforcing contracts from new institutional economics, on marketing's extensions of transaction cost theory, and on relevant literatures in marketing strategy and brand equity to develop our theoretical arguments. Our primary argument is that *brand equity affects channel governance directly and functions as an alternative governance mechanism (alternative to hierarchical governance) that enables the firm to effectively govern its channel by escalating the opportunity cost of opportunistic behavior for downstream channel partners and amplifying their replaceability. This motivates them to exercise self-enforcement and diffuses pressures for instituting a more hierarchical governance structure in the channel (higher levels of forward vertical integration)* [1].

On the methodological front, we overcome limitations of previous empirical work on the topic by estimating a Bayesian Panel Vector Autoregressive model using a large panel data set. The data set we use in our research is an unbalanced panel of 6,292 observations from North American franchise chains. Our results reveal that brand equity has a direct, powerful, but lagging impact on channel governance such that higher brand equity leads to (Granger-causes) a less hierarchical channel governance structure - as indicated earlier and in the rest of this paper, less hierarchical channel governance structure reflects lower levels of forward vertical

integration. The impulse response functions indicate that a shock to one of the proxies of brand equity takes a year or two to start materially impacting the governance structure of the channel. However, that effect keeps building momentum over time leading to a total decrease of 1.5% to 3% in the degree of forward vertical integration in the channel. Our reverse causality analysis suggests that the effect of brand equity on forward vertical integration is more pronounced, more powerful, and more persistent than the reverse effect.

Our study contributes to three marketing research streams, the brand equity literature, the channel governance literature, and a third stream focusing on the interactions among various elements of marketing strategy (e.g., Gatignon & Hanssens, 1987; Srinivasan, 2006). Substantively, we put in the hands of the senior marketing executive (e.g., CMO) empirical evidence that aids her in selling brand building initiatives to the board of directors by arguing that investments in brand equity are *dual investments* directly in the brand and indirectly in the channel which makes their risk/reward ratio superior to many other investment alternatives, especially investments in acquiring downstream channel members. This makes the challenging task of gaining organizational support for brand building activities easier considering that companies trade off competing marketing strategy options based on projected financial return (Rust, Lemon, & Zeithaml, 2004).

This paper is organized as follows. First, we review the relevant literature and introduce our theoretical arguments. Then, we describe our research methodology and present our results. Thereafter, we discuss our findings, contributions, and managerial implications. Finally, we highlight the limitations of our work and suggest some directions for future research.

LITERATURE REVIEW

Extant research in marketing on the impact of brand equity on distribution focuses mostly on channel coordination and primarily investigates how an upstream firm's (brand owner) brand equity influences the behavior of its downstream channel partners (brand sellers). In his classic paper, Montgomery (1975) observes that stronger brands have a better chance of being accepted at stores and in gaining shelf-space. In the same vein, Farris, Olver, and De Kluyver (1989) report that retailers provide better in-store merchandising and stocking to stronger brands. Subsequently, and within the same context of grocery stores, Fader and Schmittlein (1993) find that stronger brands have higher availability at retailers, and that retailers who carry few brands often carry those with higher brand equity. Lal & Narasimhan (1996) develop an analytical model that shows how retailers are willing to accept lower margins on stronger brands and are more likely to advertise stronger brands than weaker ones. In the same spirit, Bell, Chiang, and Padmanabhan (1999) document evidence that retailers stockpile stronger brands more than weaker brands during promotion periods. Similarly, Besanko, Dubé, and Gupta (2005) establish that stronger brands receive higher promotion pass-through from retailers. As evident (see Table 1), a common theme in these studies seems to be that stronger brands get better distribution, receive preferential treatment from sellers, and are less prone to downstream channel partners' opportunism. Consequently, the logical inference from this would be that brand equity helps in overcoming many channel issues and thus mitigates the channel coordination problem faced by the upstream firm (brand owner). Therefore, this should reflect on how the firm governs its channel, and the natural manifestation of this would be a less hierarchical channel governance structure i.e. lower levels of forward vertical integration (Rindfleisch & Heide, 1997). In line with this conclusion are the only two arguments we found in marketing literature on this topic.

The first argument is by Ghosh and John (1999) who posit that when brand equity is high, the firm is more capable of using market governance, whereas weaker brands "handicap" the firm from doing so. The second argument is by Coughlan, Anderson, Stern, and El-Ansary, (2006, p.351) who argue that when brand equity is high, vertical integration into distribution is not only unnecessary but rather "wasteful." However, empirical evidence on this view is yet to be comprehensively documented in marketing. Aside from the abovementioned two theoretical arguments, marketing theory seems relatively silent on the subject despite its recognition that "brand equity influences governance directly." (Ghosh & John, 1999, p.140).

In response to this research need, we undertake the first empirical effort in marketing toward studying the influence of brand equity on channel governance structure – we define channel governance structure as the institutional structure within which the firm organizes its distribution transactions (Heide, 1994; Williamson & Ouchi, 1981). In doing so, we test whether the theoretical conclusion we laid out previously, which reflects the general view in marketing, holds empirically or not. Interestingly, this view is in sharp contrast with the prevalent view on the matter in extant research (as detailed in the next section). Hence, we put these two opposing theoretical views to test and examine which one holds up better empirically.

THEORY

The relationship between brand equity and the governance structure of a distribution channel has been investigated to some extent in other disciplines, mainly organizational economics. Much of the existing research approaches the question from a pure economic organization point of view, relying on the theoretical lenses of transaction cost theory (TCT)

and/or agency theory (AT)[2]. The central idea here is that an upstream firm's brand equity is an intangible specific asset to be safeguarded against downstream channel members' opportunism (Minkler & Park, 1994; Nickerson & Silverman, 2003; Norton, 1988a) or free riding (Brickley & Dark, 1987; Lafontaine & Shaw, 2005; Mathewson & Winter, 1985). Hence, an increase in brand equity, calls for a more hierarchical channel governance structure i.e. higher levels of forward vertical integration[3].

Proponents of transaction cost theory perceive brand equity as an intangible specific asset that stimulates opportunistic behavior (e.g., poor service quality) by downstream channel members. Hence, as brand equity increases, the threat of opportunism rises, and the brand owner rationally relies on a more hierarchical channel governance structure to safeguard this valuable specific asset – the brand. For example, Norton (1988a) examines a sample of franchise chains, from the eating places and motel industries in the U.S., and finds that as brand equity increases, firms rely more on vertical integration because brand equity "creates opportunistic incentives" (Norton, 1988a, p.108). In the same vein, and within the context of the U.S. trucking industry, Nickerson and Silverman (2003) observe that the more a trucking company (motor carrier) invests in its brand name, the more likely it is to employ company drivers, as opposed to owner-operators i.e. the more vertically integrated it is. Along the same lines, Minkler and Park (1994) empirically examine a sample of public American firms from three industries (restaurants, hotels, and professional services) and find that an increase in brand equity is positively related with an increase in the degree of downstream vertical integration.

In a similar spirit, agency theorists view brand equity as a motivation for free riding by downstream channel members due to the inherent incentive divergence between the brand owner and the brand seller. Hence, as brand equity increases, distributors' incentive to free ride on the

brand, by under-delivering the pledged channel services or lowering quality standards, increases. Therefore, an increase in brand equity, calls for a more hierarchical channel governance structure to alleviate the risk of distributors' moral hazard. In their 1987 paper, Brickley and Dark study a sample of American firms from nine industries and report evidence on a positive relationship between brand equity (trademark value) and forward vertical integration. Similarly, Lafontaine and Shaw (2005) establish, using a multi-industry longitudinal sample of franchise chains, that companies with more valuable brand names are more vertically integrated and argue that they do so to protect their brands from channel partners' free-riding. In the same vein, Mathewson and Winter (1985) demonstrate, using a game theoretic model, that when brand equity increases, distributors' temptation to free ride on the brand name increases which consequently increases monitoring costs. In response to that, brand owners rely more on forward vertical integration.

An interesting observation on the aforementioned body of research is that despite the differences in the theoretical underpinnings and methodological approaches of those studies, there is clearly a strong convergence in their conception of the subject matter. First, all these studies view the relationship between brand equity and channel governance as a pure economic organization concern and thus approach it from a cost-centered perspective that is focused primarily on managing transaction/agency costs. Second, they perceive brand equity as a relatively static, external transactional attribute rather than a conscious strategic choice. Therefore, with this cost-centered and static view, it is no surprise that research in this space has predicted a positive relationship between brand equity and hierarchical channel governance structures (see Table 2). To represent this line of thinking we introduce the following view:

View 1: Higher brand equity leads to a more hierarchical channel governance structure.

[Insert Table 2 about here]

In contrast with the previous view (which perceives brand equity as a relatively static, external transactional attribute), and in line with a deep-rooted view in economics (Hoos, 1959; Nerlove & Arrow, 1962) and marketing (Fischer & Himme, 2017), we recognize brand equity as a conscious, strategic choice that involves substantial investments and carries long-term implications for the firm. Then, we draw on the theory of self-enforcing contracts from new institutional economics (Bull, 1987; Klein, 1985; Telser, 1980) as well as marketing strategy and brand equity literatures, and on marketing's extensions of TCT (primarily the alternative governance mechanisms literature e.g., Rindfleisch and Heide, 1997), to establish our theoretical arguments. Our primary argument is that the role of brand equity in interorganizational relationships is too significant to be reduced to simply being a passive transactional attribute or a stimulus for moral hazard, as proposed by previous research. Hence, we argue for a more strategic role for brand equity in governing the channel and contend that *brand equity functions as an alternative governance mechanism that enables the firm to effectively govern its channel by increasing the opportunity cost of opportunistic behavior (incentives for compliance) for downstream channel partners and amplifying their replaceability. This carrot-and-stick mechanism motivates them to exercise self-enforcement which provides an effective safeguard against their opportunism, and subsequently diffuses pressures for instituting a more hierarchical governance structure.* In what follows, we provide a more detailed explanation of our argument and the underlying theoretical logic.

What Are Alternative Governance Mechanisms?

Alternative governance mechanisms are arrangements or investments that solve governance issues without the need for vertical integration (Rindfleisch & Heide, 1997; Houston & Johnson, 2000; Brown, Dev, & Lee, 2000). Examples of such mechanisms include pledges

(Anderson & Weitz, 1992), partner selection, incentive design, and monitoring (Stump & Heide, 1996), relational norms (Heide & John, 1992), and dependence balancing (Heide & John, 1988). In this study, we extend this literature by suggesting brand equity as an additional alternative governance mechanism.

What Is a Self-Enforcing Agreement?

Most real world contracts are incomplete because the ex-ante costs (search costs, negotiation costs, and "ink costs") associated with covering all future risks and contingencies are prohibitively high (Klein, 2002). Moreover, not all aspects of a business relationship can be contracted upon or can be adequately measured due to the significant information asymmetries, several contingencies, and performance measurement issues that surround such relationships (Klein, 1985; Heide & John, 1988). However, contracting parties must be prevented from "taking advantage of the unspecified elements of contractual performance to opportunistically breach the contractual understanding." (Klein, 1985, p.90). In most business relationships, performance is secured through contractual self-enforcement rather than legal enforcement (Klein, 2002). Contractual self-enforcement occurs when the party facing termination believes that it is better off by keeping its promises than by violating them (Stump & Heide, 1996; Telser, 1980). In other words, when the rents an individual expects to gain in a relationship are greater than those available outside, the termination sanction is sufficient to make him provide the desired effort level and not act opportunistically (Klein, 2002; Wathne & Heide, 2000). Therefore, the higher and/or more stable the expected future rents from a business relationship, the more self-enforcing is that relationship, and the lower is the threat of opportunism within it.

Wathne and Heide (2000) maintain that contractual self-enforcement can be facilitated by a variety of instruments such as price premiums, margin premiums, and "hostages" – assets that

have limited salvage value outside the relationship. In this paper, we propose brand equity as an additional instrument of contractual self-enforcement in distribution partnerships. In the following sections, we discuss how brand equity leads to contractual self-enforcement by increasing the opportunity cost of opportunism for downstream channel partners and amplifying their replaceability.

How Does Brand Equity Increase The Opportunity Cost of Opportunism (Incentives for Compliance) for Downstream Channel Partners?

Srivastava, Shervani, and Fahey (1998) provide a detailed explanation of how brand equity translates into growing, persisting economic rents[4] by boosting the firm's financial performance in four ways. First, brand equity enhances cash flow through price premiums, higher market share, product cross-selling, increased revenues from the development/extension of product lines, lower sales and service cost, working capital reduction, and cobranding. Second, brand equity accelerates cash flow through faster response to marketing efforts, earlier brand trials and referrals, and reduced market penetration time. Third, brand equity reduces volatility in cash flow by enhancing customer loyalty and retention, increasing customer switching costs, improving operational stability, and enabling the firm to generate additional cash flows from services and consumables that are less vulnerable to competitive actions. Fourth, brand equity enhances the residual value of cash flow by growing the installed base, allowing cross-selling of products and services, and capitalizing on product upgrades. As a result, the economic rents of an upstream firm's brand equity boost the channel's overall financial performance by *growing the pie* and constituting a credible promise of continuing to do so. This increases the opportunity cost of opportunistic behavior for downstream channel members and boosts the self-enforceability of the relationship which, in turn, discourage downstream members

from engaging in opportunism so as to avoid losing their share of those persisting, growing future rents (Klein, 1985, 2002). This view is consistent with Davis and Mentzer's (2008) argument that brand equity increases retailers' dependence on manufacturers. In addition to growing the pie, an upstream firm's brand equity also increases the opportunity cost of opportunism to downstream channel partners through the generation of *excess rents.* Studies in economics and finance provide evidence on this practice of *opportunity cost escalation* via excess rents. Kaufmann and Lafontaine (1994) found evidence that McDonald's intentionally leaves rents on the table for its downstream partners as a mechanism for countering their opportunism and incentivizing them to exercise self-enforcement. Michael and Moore (1995) report that this practice is also common among European franchisors who deliberately leave "well-above-average returns" for their franchisees as a mechanism for curbing their opportunism through self-enforcement. Furthermore, they report that these excess rents vary from one franchisor to another where larger brands tend to leave more rents on the table for their channel partners. Therefore, the economic rents of an upstream firm's brand equity boost the channel's overall financial performance which, in turn, raises the opportunity cost of opportunism to downstream channel partners (growing and persisting pie, excess rents) and incentivizes them to uphold their promises and rein their opportunism.

How Does Brand Equity Amplify Downstream Channel Partners' Replaceability?

First, brand equity reinforces customers' loyalty (Russell & Kamakura, 1994) and intensifies their switching costs (Boulding, Lee, & Staelin, 1994). This makes *customers' attachment to the brand less dependent on retailers* and consequently increases retailers' replaceability. Second, brand equity builds barriers against competition (Srivastava, Shervani, & Fahey, 1998), creates sustainable competitive advantage (Barney, 2014), reduces the threats of

new entrants (Breivik & Thorbjørnsen, 2008), facilitates innovation (Brexendorf, Bayus, & Keller, 2015), and strengthens demand (Keller, 2003). This fortifies the firm's market position and increases its attractiveness to high-quality distribution partners should the firm be interested in replacements for existing downstream channel members. Moreover, the temptation of excess rents and persisting, growing financial returns discussed earlier creates a large queue of qualified replacements ready to step in whenever the upstream firm wants to replace an incumbent downstream partner. This gives the upstream firm more *partnering optionality*. Third, brand equity not only expands the firm's partnering optionality, but also enhances its *bargaining position* (Ghosh & John, 2009). This makes the process of replacing an incumbent downstream member much easier and enables the firm to extract even more favorable contractual terms. Therefore, the brand equity of an upstream firm connects current and future customers to the brand rather than the seller, increases the firm's partnering optionality, and enhances its bargaining position, all of which amplifies the replaceability of its downstream channel partners should they choose to prefer the short-term gains of opportunism to the long-term rewards of compliance. This reasoning is similar in spirit to Heide and John's (1988) work on dependence balancing via offsetting investments wherein they argue that retailers safeguard themselves against manufacturers' opportunism by investing in customer relationships that increase manufacturers' replaceability, and consequently reduce the retailers' dependence on them. In our reasoning, we examine the situation from the opposite angle: manufacturers safeguarding themselves against retailers' opportunism by investing in brand equity to increase retailers' replaceability by connecting current and future customers to the brand, rather than the retailer, and by enhancing their partnering optionality and bargaining position.

Channel Governance through Brand Equity

The economic rents of an upstream firm's brand equity constitute a *credible promise* of continuing and improving overall financial performance of the channel. This escalates the opportunity cost of opportunistic behavior for downstream members and acts as an incentive for compliance. In addition to that, an upstream firm's brand equity constitutes a *credible threat* of replaceability to downstream channel members by connecting customers to the brand rather than the seller, and enhancing the upstream firm's partnering optionality and bargaining position. This intensifies the cost of opportunism to downstream members and acts as a deterrent against deviance. Taken together, these two effects discourage downstream channel partners from engaging in opportunistic actions and motivates them to exercise self-enforcement which makes brand equity an effective channel governance mechanism. In other words, by investing in brand equity, an upstream firm sends two messages to its downstream channel partners. First, there is too much at stake in the long-term (a growing pie for all channel members and excess future rents for the downstream channel member) to jeopardize for some short-term gains from opportunistic actions. Second, if a downstream partner chooses to overlook this *carrot* and engage in opportunism, he is more replaceable (stronger customer attachment to the brand, more partnering optionality, enhanced bargaining position). This *carrot-and-stick* mechanism leads to a *self-enforcing contractual relationship* that effectively curbs opportunism and reduces the need for hierarchical governance (for a graphical step-by-step illustration of this logic, please refer to Appendix A). To reflect our line of thinking, we advance the following rival view:

View 2: Higher brand equity leads to a less hierarchical channel governance structure.

DATA AND MEASUREMENTS

Research Context

To empirically test the two theoretical views we discussed earlier, we choose the context of franchising. We believe that franchising is an appropriate empirical setting for our research for the following reasons. First, *Economic Prevalence*: Franchising is a ubiquitous business format that occupies a significant place in the business landscape. Large franchises such as Subway, McDonald's, Hilton, Radisson, Petland, Baskin-Robbins, Cinnabon, Coldwell Banker, Radio Shack, and Hertz are leading brands that constitute a part of consumers' everyday life all around the globe. More than 40% of all retail sales in the U.S. and approximately one third of all retail sales in the U.K. go through franchise chains (Lindblom & Tikkanen, 2010). In 2016, there were 795,932 business establishments in the U.S. franchise systems, which employed more than nine million people, with direct economic output close to $552 billion (IHS Economics, 2016). Second, *Industrial and Organizational Diversity*: Franchising offers a rich empirical environment in that it spans a broad range of industries and comprises a diverse universe of companies: large and small, private and public, local and global which increases the generalizability of our results. As observed in Web Appendix A, our sample includes brands from more than 40 industries. Third, *The Salience of Brand Equity:* Brand equity is a vital asset that can be employed to generate future rents, boost market position, enhance customer loyalty, and increase trustworthiness (Keller, 2003). In the franchising context, brand equity plays an even more crucial role and is often considered as "the most distinguishing feature of a franchise" (Wu, 1999, p.87). Brand equity can serve as a magnet that attracts high quality partners, who are the cornerstone of any successful franchise system, and may act as a reliable signal that mitigates the high informational asymmetry between the franchisor and its would-be franchisees. The

entire franchising business model can be thought of as a "leasing of the brand name" as Brickley and Dark (1987, p.402) refer to it. This makes franchising an ideal setting for our research question that has brand equity at its core. Fourth, *Significant Variations in Channel Governance and in Brand Equity.* Franchise chains exhibit substantial variations in their degree of vertical integration: Some are almost 100% integrated (hierarchies), others are less than 0.01% integrated (markets), and the rest are distributed along the continuum between these two endpoints. A similar level of variation is present in brand equity as well: Some franchise chains carry global brand names such as McDonald's, Radisson, and Hertz while others reflect small local brands. These variations provide an excellent setting for our research question, which is assessing the causal link between brand equity and channel governance.

Data

The data sources we use in this study are *Bond's Franchise Guide* and the *Annual Franchise 500 Ranking* by *Entrepreneur* magazine. Both sources have been used in prior research, and their consistency and reliability have been verified by a number of researchers (Lafontaine, 1995; Shane, Shankar, & Aravindakshan, 2006). Researchers from various disciplines have used *Bonds'* (e.g., Gillis, Combs, & Ketchen, 2014; Jindal, 2011; Kacker et al., 2016; Scott, 1995) and *Entrepreneur*'s (e.g., Lafontaine, 1992; Shane, 1998; Shane, Shankar, & Aravindakshan, 2006) data in their work, and some (e.g., Antia, Zheng, Frazier, 2013; Lafontaine & Shaw, 2005) have used the two sources jointly, as we do in this study. Using these two sources, we compiled a panel data set of North American, franchise-level annual observations for the period from 2001 to 2009. Our data set is an unbalanced panel that consists of 6,292 observations[5, 6].

Measures

Dependent variable. We operationalize channel governance structure as the degree of vertical integration in the franchise system and measure it as the percentage of company-owned units in the overall chain. We obtain this measure by dividing the number of company-owned outlets by the total number of outlets (company-owned plus franchised) in the chain. This measurement approach has frequently been used in the channel governance literature (e.g., Anderson & Weitz, 1992; John & Weitz, 1988; Vinhas & Anderson, 2005) to represent the continuum of governance structures extending between the two polar extremes: market and hierarchy. In our model, the higher the percentage of forward vertical integration, the more hierarchical is the channel governance structure; the lower the percentage, the less hierarchical the governance structure.

Independent variable. We recognize that our independent variable brand equity is a complex, multidimensional construct and that, similar to all previous research in this domain (see Tables 1 and 2), we use proxies to measure this construct. However, for a proxy to be valid, the link between the proxy and the target construct should be based on "reasonable assumptions" (Antia, Mani, & Wathne, 2017). To achieve this, we (a) rely on existing, established proxies that were used by previous research in this domain and whose link to brand equity is explicit and/or reasonable, and (b) use two proxies, rather than one, one formative and one reflective to capture both *actions* that enhance brand equity (e.g., advertising) and *indications* of brand equity (e.g., brand rankings or media recognition). In so doing, we depart from previous research, which relied on either reflective or formative proxies for operationalizing brand equity (see Tables 1 and 2) and mostly used a single proxy.

Our first proxy - a formative proxy - is the *advertising fee,* which is an ongoing fee that is contractually imposed by the franchisor on all its franchisees for the sake of promoting the brand through advertising. This fee is in the form of a percentage of total sales that is paid periodically by each franchisee toward an advertising fund that is managed by the franchisor. In this regard, Windsperger (2004, p.1364) notes that "The more important the franchisor's brand name … the more marketing investments (national advertising and promotion measures) are required to maintain the brand name value, and the higher are the advertising fees paid by the franchisees." Prior research in marketing (e.g., Agrawal and Lal, 1995; Windsperger, 2004), economics (Lafontaine & Shaw, 2005), and management (Nickerson & Silverman, 2003) has employed this proxy in its operationalization of brand equity.

The second proxy – a reflective proxy - is *media recognition*. We measure media recognition as the reverse coded ranking of the franchise system by *Entrepreneur Magazine's Franchise 500* annual ranking of the top 500 North American franchises. *Entrepreneur* states that it uses a proprietary algorithm developed by its panel of experts to rank franchise systems based on a set of factors that include the brand. Scott and Spell (1998, p.50) maintain that when it comes to franchise systems, an "indication of brand name value is the system's ranking in Entrepreneur Magazine." In the same spirit, Combs, Ketchen, and Hoover (2004) assembled a panel of experts consisting of hospitality executives and academics, asked them to rank the franchise chains in their sample, and then used this ranking as a proxy for brand equity. Rao (1994) and Shane & Foo (1999) provide a detailed justification for this approach for measuring "intangible capabilities" such as brand equity. Shane and Foo (1999) provide a detailed description of the ranking process and the magazine.

Control variables. A firm's decision to operate at a high or low level of forward vertical integration is a strategic decision that can be influenced by several factors. Hence, to rule out some alternative explanations, we control for a number of possible confounding effects. First, some firms have substantial resources that enable them to own their entire distribution network, or a large part of it, which translates into higher levels of downstream vertical integration in their channels. To account for the confounding effect of firm resources, we use two control variables – financing support (whether the franchisor provides financing support to its current and prospective franchisees) and chain age. Previous research (e.g., Lafontaine, 1992; Minkler & Park, 1994) has used these two measures as indicators of firm resources based on the arguments that (a) the more established the firm, the higher its capital availability and (b) a firm should already have substantial resources to be able to finance its downstream channel partners. Second, a firm's ability to extensively engage in direct distribution might be influenced by whether it possesses or lacks the required knowledge and expertise for doing so. Some firms do not rely heavily on direct distribution simply because they do not have the required skill and experience to do that, regardless of any other consideration, whereas others do it simply because they can. To address this, we control for the business development time, which is the period for which the company operated as a non-franchising business, directly dealing with end customers before licensing its first franchisee. Third, following prior research, we control for chain size as a proxy for firm performance (Kacker et al., 2016; Shane, Shankar, & Aravindakshan, 2006) or firm responsiveness (Nickerson & Silverman, 2003). Fourth, we control for the geographic scope of the firm – whether the firm is active in international markets or not. Finally, there could be some systematic characteristics or prevailing trends within an industry, as a whole, that influence firms' behavior in that industry when it comes to channel governance. To account for this, we

control for industry-specific effects. Furthermore, in the robustness analyses section we conduct several validation checks to rule out other possible alternative explanations and statistical biases. Among those robustness tests is running the model on trimmed subsamples (e.g., Raassens, Wuyts, & Geyskens, 2012) that exclude firms with very high or very low levels of vertical integration (we excluded the ± 5, ±10, ±15, and ±20 percentiles), and running the model with and without control variables to test the robustness of the results to the inclusion or exclusion of control variables.

In Table 3 we provide a summary of the measures we use, along with their symbols as they appear in the empirical model

[Insert Table 3 about here]

The descriptive statistics and correlations are presented in Table 4.

[Insert Table 4 about here]

ECONOMETRIC MODELING

Limitations of Prior Studies

As highlighted earlier, the impact of brand equity on channel governance has been investigated by a number of researchers, primarily in organizational economics, during the past three decades. However, existing empirical work reveals several methodological limitations, most of which are acknowledged by the authors themselves. First, previous research does not model *lagged effects* which is a crucial concern when dealing with such a research question due to the logically lagged, slowly unfolding nature of the effect of one variable on the other, and the

strategic long-term nature of many channel and brand decisions. Marketing researchers have long established that only a small portion of the total effect of brand equity appears in the short run, while the majority of the impact is often realized in the long run (Aaker & Jacobson, 1994; Mizik, 2014). Second, several extant studies on the impact of brand equity on vertical integration do not control for *endogeneity*, which could be a significant source of bias considering that (a) the firm's decision to increase its downstream vertical integration or to invest in the brand are strategic decisions that could be influenced by many financial and non-financial factors and (b) both brand and distribution are elements of the firm's overall marketing strategy. Third, earlier empirical work does not assess any form of *causality* and focuses mainly on examining whether there is a significant association between brand equity and vertical integration. Fourth, existing research does not investigate *reverse causality* which is quite plausible in such a relationship. To overcome these methodological limitations and provide deeper insights into the impact of brand equity on channel governance, we use a Bayesian Panel Vector Autoregressive model (BPVARX). We present a comparison between the methodological approaches of prior studies and our study in Table 2.

The Empirical Model

Model motivation. To overcome the methodological limitations described earlier, we need an econometric modeling approach that enables us to (a) investigate lagged effects while controlling for endogeneity and firm-level heterogeneity, (b) estimate the "long-term or cumulative effects of causal variables" (Borah & Tellis, 2016, p.148), (c) conduct an assessment of reverse causality, and (d) "get as close to causality as possible with nonexperimental data" (Kang, Germann, & Grewal, 2016, p.72). These modeling needs suggest the use of a *Bayesian*

Panel Vector Autoregressive model (e.g., Canova & Ciccarelli, 2013; Chakravarty & Grewal, 2011) with exogenous variables (BPVARX).

In general, Panel Vector Autoregressive (PVARX) models (e.g., Borah & Tellis, 2016; Kang, Germann, & Grewal, 2016; Hewett et al., 2016) are powerful empirical models in that they bring together the ability of panel data models to capture unobserved individual heterogeneity with the dynamism of vector autoregressive models in their ability to model lagged effects while treating variables as endogenous and allowing for feedback loops among them. Bayesian Panel Vector Autoregressive (BPVARX) models bring in an additional layer of power by addressing some of the limitations of unrestricted (traditional) VAR models.

First, as Chakravarty & Grewal (2011, p.1601) note, "traditional VARX techniques work well with individual time series only if there are a substantial number of observations over time. With panel data, the time series for each cross-sectional unit typically is limited [as in] most firm-level panel data used in marketing, whereas consistent estimation of the parameters requires dozens of observations of both endogenous and exogenous variables (e.g., Holtz-Eakin et al., 1988; Kiviet, 1995). Econometrics research suggests dealing with small time-series observations for cross-sectional units by pooling the data from different units and allowing for heterogeneity in individual effects (e.g., Binder et al., 2005; Holtz-Eakin et al., 1988). With the BVARX approach, we can pool all cross-sectional units and allow for heterogeneity in the associations between variables (random effects parameterization)".

Second, "Unrestricted VAR models suffer from the problem of overparameterization" (Maddala, 1992, p.602) and hence "can handle only a few variables, because the number of parameters to be estimated grows at a quadratic rate with the number of variables, often leading to the omission of important variables and inconsistent parameter estimations (e.g., Leeper et al.,

1996). The BVARX approach overcomes this limitation by allowing for shrinkage of the parameter space through the imposition of prior distributions on the parameters (e.g., Doan et al., 1984; Leeper et al., 1996).” (Chakravarty & Grewal, 2011, p.1601).

Third, Bayesian models are known for their ability to “account for individual firm differences” (Hansen, Perry, & Reese, 2004, p.1280) and “adequately model” the heterogeneity in response parameters (Mackey, Barney, & Dotson, 2016) which provides stronger “predictive performance” (Rossi & Allenby, 1993, p.180). Moreover, “large samples cause Bayesian methods to become less dependent on subjective aspects of the prior distribution and therefore more objective” (Allenby, 1990, p.379).

For these reasons, it is no surprise that PVAR researchers such as Canova and Ciccarelli (2004, p.329) maintain that “Bayesian VARs are known to produce better forecasts than unrestricted VARs.”

Model specification. VAR models can be specified in levels, first differences, or as a mixture of both (Chakravarty & Grewal, 2011). Model specification depends on the stationarity of the endogenous variables such that stationary variables enter the VAR model in levels and nonstationary variables enter in their first difference (Steenkamp et al., 2005). As we discuss next, our variables have different orders of integration - some are stationary and others are not - and therefore we use a mixed specification (e.g., Hewett et al., 2016). The first and foremost step in any VAR model is to test for the order of integration to identify the presence of unit roots that could lead to spurious regressions (Granger & Newbold, 1974; Phillips, 1986). Hence, we used two tests of panel data stationarity, a Levin-Lin-Chu (Levin, Lin, & Chu, 2002) test - which assumes a common unit root process for all variables - and an Augmented Dickey-Fuller (ADF) test (Choi, 2001) - which assumes individual unit root processes. Due to the unbalanced nature of

our panel, we cannot use the Im-Pesaran-Shin (2003) test (Kang, Germann, & Grewal, 2016). For the first endogenous variable, *VI*, both the Levin-Lin-Chu ($p<0.03$) and the ADF ($p<0.0001$) tests rejected the null hypothesis of unit root presence. So, this variable enters the BPVARX system in level. Turning to the rest of the endogenous variables, a unit root was detected in the other two endogenous variables *Ad* and *Media.* Therefore, they are represented in the BPVARX model in their first differences. Next, we conducted a Johansen procedure (Johansen, 1995) to test for the presence of cointegrated vectors among the endogenous variables. The test reported no cointegrating equations by both the trace test ($p<0.05$) and the maximum Eigenvalue test ($p<0.05$). For lag length specification, we followed previous studies (e.g., Borah & Tellis, 2016; Hewett et al., 2016) and used the Schwartz Bayesian Information Criterion for identifying the optimal lag length. As per the results presented in Web Appendix B, the optimal lag length is five. So, all our endogenous variables are represented in the model by five lags. This lag length is sufficient to eliminate any residuals correlation from the model and this was further confirmed by the results of a Ljung-Box test (Box & Pierce, 1970; Ljung & Box, 1978) where the test failed to reject the null hypothesis of no serial correlation in residuals ($Q=11.62$; $p>0.23$).

Model construction. To explore the causal relationship between brand equity and channel governance structure (operationalized as the degree of forward vertical integration in the channel), we develop the following BPVARX model:

$$\begin{pmatrix} VI_{it} \\ \Delta Ad_{it} \\ \Delta Media_{it} \end{pmatrix} = \begin{pmatrix} C_{Vi,0} \\ C_{Ad,0} \\ C_{Media,0} \end{pmatrix} + \sum_{l=1}^{L} \begin{pmatrix} \beta_{11}^{l} & \beta_{12}^{l} & \beta_{13}^{l} \\ \beta_{21}^{l} & \beta_{22}^{l} & \beta_{23}^{l} \\ \beta_{31}^{l} & \beta_{32}^{l} & \beta_{33}^{l} \end{pmatrix} \begin{pmatrix} VI_{i,t-l} \\ \Delta Ad_{i,t-l} \\ \Delta Media_{i,t-l} \end{pmatrix} + \begin{pmatrix} \gamma_{1,1} & \cdots & \gamma_{1,6} \\ \vdots & \ddots & \vdots \\ \gamma_{6,1} & \cdots & \gamma_{6,6} \end{pmatrix} \begin{pmatrix} X1_{i,t} \\ X2_{i,t} \\ X3_{i,t} \\ X4_{i,t} \\ X5_{i,t} \\ X6_{i,t} \end{pmatrix}$$

$$+ \begin{pmatrix} \varepsilon_{VI,i,t} \\ \varepsilon_{Ad,i,t} \\ \varepsilon_{Media,i,t} \end{pmatrix}$$

where i = 1, 2,…, N firms is the cross-sectional index; t = 1,2,…,T years is the longitudinal time index; l = 1,2,…,L lags is the lag index; VI, Ad, Media are the endogenous variables (see Table 3); C_0 is the intercepts vector; β and γ are coefficients vectors to be estimated; X1, X2, …, X6 are exogenous control variables; ε_{it} is a vector of normally distributed errors.

RESULTS

We present our results in the following order: (1) generalized impulse response functions, (2) Granger causality analysis, (3) reverse causality analysis, and (4) robustness analyses.

Generalized Impulse Response Functions (GIRFs)

One of the distinctive features of the VAR family of models is their ability to demonstrate the causal long-term effect of one variable on another through dynamic graphical intuitions known as impulse response functions or IRFs. Hence, researchers (e.g., Dekimpe & Hanssens, 1999; Kang, Germann, & Grewal, 2016) often rely on IRFs to isolate the effect of a shock in one of the endogenous variables on another, while holding all other endogenous variables constant. So, for the ease of exposition, we report the Bayesian PVARX estimates in Web Appendix C and discuss the IRFs outputs in the following section.

To describe the effect of a shock in brand equity on channel governance over time, we present the graphs of the generalized impulse response functions (GIRFs) in Figure 1. The GIRFs displayed are based on generalized shocks (one standard deviation). However, for robustness purposes, we also produced (see Web Appendix D) the impulse response functions that are based on orthogonalized shocks (one standard deviation) obtained from a causal ordering procedure using Cholesky's decomposition of the residuals matrix (Hamilton, 1994). In addition

to the GIRFs, we report the accumulated GIRFs, which represent the cumulative sum of the impact of the shock to one of the proxies of brand equity on the degree of vertical integration in the channel over time (see Appendix B). As evident in all four IRF graphs, a shock to one of the proxies of brand equity (Ad or Media) negatively impacts the degree of forward vertical integration in the channel leading to a less hierarchical channel governance structure. Furthermore, the effect seems persistent and keeps building up over time rather than fading away. These results provide strong empirical support for the second theoretical view (V_2) over the rival view V_1.

[Insert Figure 1 about here]

Additionally, the GIRFs indicate that the majority of the effect of brand equity on channel governance tends to be lagged in nature. This is not surprising when we consider the strategic nature of both channel and brand decisions, and the fact that governance adjustment is a time-consuming process that demands significant resource allocation and careful execution. Previous research in marketing has documented similar trends (e.g., Mela, Gupta, & Lehmann, 1997) and established that, in general, only a small portion of the total impact of brand equity materializes in the short run, while the bulk of the impact is often realized in the future (Aaker & Jacobson, 1994; Mizik, 2014).

The GIRFs graphs in Figure 1 provide a more granular description of the effect dynamics and allow for a better understanding of the phenomenon. As demonstrated in these graphs, a shock to the first proxy of brand equity, Advertising Fee, has a slight initial impact (-0.05%) on the degree of vertical integration in the channel. However, starting from year 2, the impact starts to emerge (-0.25% in year 2) and then it keeps gaining momentum over time (getting to 0.48% in

year three) before it stabilizes from year 5 onwards. On the other hand, a shock to the second proxy of brand equity, Media Recognition, has a stronger initial impact (-0.24% in year 1) but it takes a while before it starts building momentum from year four onwards and then it stabilizes from year seven onwards. Therefore, the effect of the first proxy, advertising fee, starts at a slower pace but accelerates faster and delivers a stronger total effect, whereas the effect of the second proxy, Media Recognition, starts at a faster pace, but accelerates slowly and leads to a smaller total effect (see the accumulated IRFs in Appendix B). A possible explanation for these effects could be that the first proxy is a formative indicator (which represents actions that could enhance brand equity in the future), and hence it takes a while to reflect on the brand and consequently on the channel structure. On the other hand, the second proxy is a reflective indicator (i.e. a current manifestation or indication of an increase in brand equity) and hence carries a more immediate impact on channel structure.

Due to their Bayesian nature, the GIRFs of BPVARX models do not come with confidence intervals in most statistical packages. However, in the next section, we provide evidence on the statistical significance of the effect in three ways: (a) by reporting the results of the Autoregressive Distributed Lag model, which indicate significance levels (see Table 5); (b) in our robustness analyses section, we confirm statistical significance by providing the GIRFs of the unrestricted PVARX model, which are accompanied by confidence intervals (see Appendices C and D); and (c) we present the variance decomposition analysis results as a further confirmation (see Web Appendix E).

[Insert Table 5 about here]

Granger Causality

A distinctive feature of VAR models is their ability to assess a certain form of causality known as *Granger causality* (Granger, 1969). Granger causality is a form of *predictive causality* that relies on a set of Wald tests to investigate whether (a) the cause is correlated with the effect; (b) the cause precedes the effect, and (c) the cause carries a significant predictive ability about the future values of the effect i.e. Y(effect) can be better predicted using the lagged values of both X(cause) and Y(effect) than it can by using the lagged values of Y only (Granger, 1980). Statistical software such as EVIEWS, which we use in our analysis, do not provide direct tests for Granger causality for BPVARX models. However, since the explanatory variables are the same in each equation in the BPVARX model and since our model is free from any residuals correlation (see the model specification section earlier), the individual ARDL (Autoregressive Distributed Lag) estimates are equivalent to those of the system-of-equations, and so are their estimated variances (Borah & Tellis, 2016; Kang, Germann, & Grewal, 2016; Zellner, 1962). Therefore, to test for Granger causality, we extract the equation in which the degree of vertical integration (VI) is the dependent variable from the BPVARX system-of-equations, estimate it by OLS, and then apply the Granger causality procedure (Wald tests) on the estimates. As expected, the fit statistics (Adjusted R-square= 95.16%) for the individual ARDL are similar to those of the system of equations (Adjusted R-square=94.98%). The results reveal that both proxies of brand equity - Advertising Fee ($F=9.26$; $p<0.001$) and Media Recognition ($F=3.62$; $p<0.05$) - Granger-cause forward vertical integration (see Table 5). To test the robustness of our results to non-response selectivity bias, we extracted the balanced sub-panel from our unbalanced panel and ran the same model on it (Balestra & Nerlove, 1996). The result remained highly consistent.

Reverse Causality Analysis

In response to recent editorial calls in leading marketing journals (e.g., Tellis, 2017), we explore the possibility of reverse causality in the relationship under examination. Having established that brand equity Granger-causes channel governance (operationalized as the degree of forward vertical integration in the channel), we investigate Granger causality in the opposite direction i.e. whether channel governance has a causal impact on brand equity. Interestingly, we find evidence that Granger causality goes in the other direction as well ($F=45.97$; $p<0.001$ for Advertising Fee, and $F=3.84$; $p<0.05$ for Media Recognition). To get a better understanding of the dynamics of the effect in each direction, we turned to the GIRF graphs. The GIRFs suggest that the impact of brand equity on channel governance (Figure 1) is more pronounced, persistent, and powerful than that of channel governance on brand equity (Figure 2). The same results are further confirmed by the accumulated GIRFs (Appendix B vs. Appendix E). Therefore, we can conclude that *reverse causality exists but it is relatively weaker. The effect is more pronounced, powerful, and persistent from brand equity to channel governance than in the opposite direction.*

[Insert Figure 2 about here]

Robustness Analyses

To further validate our results and exclude some potential alternative explanations and statistical biases, we conducted several robustness checks. We discuss them below.

Unrestricted vs. Bayesian PVARX. As discussed earlier, "unrestricted VAR models suffer from the problem of overparameterization" (Maddala, 1992, p.602) which leads to forecasts with large standard errors and imprecise coefficient estimates (Canova, 2007, p.373). In addition to that, they do not work well with short panels, which is often the case in most marketing strategy

panel data where we often have many individual units and few time periods (Chakravarty & Grewal, 2011). This makes them less consistent than their Bayesian counterparts, which "has been found to give better results and has a good forecasting record." (Maddala, 1992, p.602). That said, we ran an unrestricted PVARX model to see whether our results remain consistent and to further confirm the temporal causation argument. Our results remained consistent - both the GIRFs (Appendix C) and the accumulated GIRFs (Appendix D) confirm the results of the Bayesian PVARX model in terms of statistical significance and directionality.

Alternative prior distributions. In this study, we followed previous research (e.g., Chakravarty & Grewal, 2011) in our choice of the Bayesian prior distribution and applied a Wishart prior. To test the robustness of our results against alternative prior distributions, we ran the model using a Minnesota prior. The results remained consistent (see Appendix F).

Orthogonalized vs. generalized IRFs. In our results section, we followed extant research in marketing (e.g., Borah & Tellis, 2016; Kang, Germann, & Grewal, 2016) and presented the IRFs that are based on generalized shocks. To further validate our results, we produced the IRFs that are based on orthogonalized shocks obtained from a causal ordering procedure using Cholesky's decomposition of the residuals matrix. We found them to be them very similar to the generalized IRFs. We report them in Web Appendix D.

Alternative lag lengths. To check the robustness of our results to alternative lag length selection criteria (e.g., Akaike Information Criterion, Hannan-Quinn Information criterion, and Akaike's Final Prediction Error), we ran our BPVARX model using the lag lengths suggested by different selection criteria (L=3,4,6). The results remained consistent (see Web Appendices F, G, H).

BPVAR vs. BPVARX. To test the robustness of our results against the potential influences of some of the control variables, we ran a BPVAR model i.e. the model with the endogenous variables only excluding all controls. The results remained consistent for both prior distributions (see Web Appendices I and J).

All-in-first-difference model specification. As we have discussed earlier in the model specification section, the standard practice in VAR models is to specify stationary variables in levels regardless of the order of integration of other endogenous variables (e.g., Hewett et al., 2016). However, some researchers choose to first difference stationary variables as well in the presence of some nonstationary endogenous variables to have an all-in-first-difference model specification. To further validate our results, we ran an all-in-first difference model by first differencing all variables. The results remained robust for both prior specifications (see Web Appendices K and L).

Non-response selectivity bias. To test the robustness of our results to non-response selectivity bias, we extracted the balanced sub-panel from our unbalanced panel and ran the same model on it (Balestra & Nerlove, 1996). The results remained consistent for both prior distributions. We present the IRFs in Web Appendices M and N.

Outliers. To test the robustness of our results to the exclusion of extreme values, and to further confirm the presence of the effect, we ran the BPVARX model on different trimmed subsamples (excluding $\pm$ 5, $\pm$10, $\pm$15, and $\pm$20 percentiles). The results remained consistent under both prior distributions, Wishart and Minnesota (see Web appendices Q to X).

Temporal causation verification. Panel VAR models combine the characteristics of panel regressions with those of vector autoregressions which enables them to capture both the temporal

effect and its cross-sectional variation. However, to further confirm the temporal effect, we conducted two additional analyses. First, as we discussed earlier, we ran an ARDL model (e.g., Borah & Tellis, 2016; Kang, Germann, & Grewal, 2016) which provided additional support to the temporal effect suggested by the BPVARX model as indicated by the results in Table 5. Second, we further validated the temporal effect by running an unrestricted PVARX model which captures unobserved firm-level heterogeneity (fixed-effects). Again, the unrestricted PVARX results confirmed the temporal effect in terms of both statistical significance and directionality. Further validation of this using individual brand-specific VARs is almost impossible because such decisions are strategic by nature. Firms do not change their channel governance strategy or brand strategy monthly or quarterly since such initiatives take time to implement and require even more time (years) before their results fully materialize and an objective assessment can be conducted. Therefore, such data (e.g., degree of vertical integration, brand ranking) are of low frequency and typically annual in nature. If we were to run a VAR model using a single brand, then a case to variable ratio of 10:1 would require 630 years of data (3 endogenous variables with 5 lags each, plus 6 control variables, multiplied by 3 equations i.e. 63 coefficients to be estimated). Even if we run the model with only two variables, using two lags, and only two controls, that would still require 120 years of data. Even if we assume that such decisions are taken quarterly, and we have quarterly data, that would still require more than thirty years of data to run a brand-specific VAR. This is where a Bayesian Panel VAR helps in overcoming the problems of overparameterization and the short nature of most strategic variables panels (Chakravarty & Grewal, 2011).

DISCUSSION

In our endeavor to calibrate the impact of brand equity on channel governance, we drew on the theory of self-enforcing contracts from new institutional economics, the marketing strategy and brand equity literatures, and marketing's extensions of transaction cost theory (primarily the alternative governance mechanisms literature e.g., Rindfleisch and Heide, 1997). Then, we advanced a theoretical view that argues that higher brand equity leads to a less hierarchical channel governance structure – this view contrasts with the prevalent view in extant research, which observed the relationship from a pure economic organization perspective. To provide empirical evidence on our view (while overcoming the methodological limitations of earlier research), we employed a Bayesian Panel Vector Autoregressive (BPVARX) model. Our results reveal a direct, powerful but lagging impact for brand equity on channel governance such that higher brand equity leads to (Granger-causes) a less hierarchical channel governance structure (lower levels of downstream vertical integration).

Theoretical Contributions

In this study, which to the best of our knowledge is the first study in marketing that examines how brand equity influences channel structure, we investigated the impact of brand equity on channel governance. In so doing, we scratched the surface of an important relationship that is recognized by both practitioners and scholars (e.g., "brand equity influences governance directly" – Ghosh and John, 1999, p.140), but yet not sufficiently researched in marketing. In responding to this research need, we contribute to the advancement of marketing theory in a number of ways. First, we extend the brand equity literature by identifying a new strategic role for brand equity that goes beyond customers, competitors, employees, and shareholders to reach

channel partners. Brand equity is a vital asset that helps the firm in governing its channel by curbing downstream members' opportunism through contractual self-enforcement. Second, we contribute to the channel governance literature by proposing brand equity as an additional alternative governance mechanism that enables the firm to govern its channel without the need for extensive downstream vertical integration. This points to the important role brand equity plays in channel coordination and governance. Third, we contribute to an under-researched stream in marketing strategy that is concerned with understanding the interactions among marketing mix elements. Most marketing strategy research focuses on a particular element of the marketing mix such as channel, brand, or pricing (Srinivasan, 2006). But, in reality, firms craft their marketing strategy as an intertwined whole and consider synergies, tradeoffs, and interdependencies among marketing mix elements (Capon, Farley, & Hoenig, 1990; Gatignon & Hanssens, 1987). Hence, exploring such interactions and interdependencies is crucial for both scholarship and practice. In this spirit, we add to this growing stream of research (e.g., Gatignon & Hanssens, 1987; Srinivasan, 2006; Yoo, Donthu, & Lee, 2000) by probing into one of the aspects of the dynamic association between brand and distribution. Finally, our modeling approach, which is new to the channels literature, offers many methodological advantages and presents a practical example of how sophisticated, dynamic research methods can assist in overcoming some of the limitations of previous research (see Table 2), and therefore provide deeper, richer, and more discerning insights into a number of phenomena.

Managerial Implications

On the managerial front, our study offers a number of valuable, actionable insights that can assist senior executives in their strategic decision making, especially in terms of capital allocation to competing marketing investments (see Table 6). First, senior marketing managers

are often faced with the challenge of justifying marketing investments to the board of directors and other stakeholders. When it comes to investments in brand equity, it becomes even more challenging due to the intangibility and the long-term nature of the beneficial outcomes of such investments. In this study, we put in the hands of the senior marketing manager empirical evidence that aids her in selling brand building initiatives to the board of directors by arguing that investments in brand equity could enhance channel performance. By strengthening its brand equity, a firm increases its influence on its downstream channel members which, in turn, improves channel coordination and subsequently boosts the firm's financial performance. Second, in line with a substantial body of scholarly work in marketing, we advise against unnecessary vertical integration especially in situations where the firm enjoys a moderate to high level of brand equity. Whereas the temptation of control might compel some mangers to pursue vertical integration, it is a costly, risky investment that demands large resource commitments that often outweigh the foreseeable gains of such a venture (Hitt, Harrison, & Ireland, 2001, p.3). Therefore, it should only be considered in situations of low or unstable brand equity and only after exhaustive scrutiny. As evidenced in this study, as brand equity increases, firms lean more on their brands to curb downstream members' opportunism, and hence reduce the need for extensive involvement in direct distribution. Finally, when contemplating two marketing investment decisions (one in forward vertical integration and the other in boosting brand equity), senior executives should note that investments in brand equity may offer a lower risk/reward ratio and a better hedge against uncertainty because of their nature as *dual investments* directly in the brand and indirectly in the channel. By investing in the brand, the firm reduces the need for investing in forward vertical integration because, as we have just theorized and empirically

assessed in this study, brand equity functions as an alternative governance mechanism that enables the firm to effectively govern its channel through contractual self-enforcement.

[Insert Table 6 about here]

Limitations & Research Directions

In this study, we strived to overcome the theoretical and methodological limitations of existing research on the topic. Notwithstanding that, our work has several limitations that offer opportunities for future research. First, despite the broadness of our context and its adequacy to the research question, and our reliance on well-established measures from the literature, the generalizability of our results could be further enhanced through the convergence of findings from other studies using alternative measures in different contexts. Hence, future research could examine the robustness of our results to different contexts and measures. Second, regarding causality, as Granger himself cautioned, predictive causation is not natural causation (Granger, 2004), and an investigation of natural causality requires experimental research designs (Shadish, Cook, & Campbell, 2002). Therefore, despite our detection of empirical evidence on the presence of predictive causality, a contention that higher brand equity causes less hierarchical channel governance could be overstated due to the non-experimental setting of our research. Third, due to data restrictions and because the focus of this study is to establish the causal impact of brand equity on channel governance, we do not test the underlying process by which higher brand equity leads to lower levels of downstream vertical integration. Moreover, doing so would require measuring concepts such as replaceability, opportunity cost of opportunism, degree of self-enforceability, incentives, and opportunistic behavior. Such constructs lend themselves naturally to survey data and cannot be easily captured by the data sources used in this study. Fourth, we do not control for some relevant factors such as environmental uncertainty - a

common element in many channel governance models. Future research may apply different measurements, use alternative contexts, test some of the links in the underlying process, control for some of the factors that we could not control for, and perhaps apply experimental designs to validate the consistency of our results. In addition to that, future research could examine whether the same effect holds for backward vertical integration, especially that there is some anecdotal evidence suggesting that retailers such as Walmart and Amazon rely on their brand equity in governing their supply chain without the need to acquire their suppliers. Finally, as we have explained earlier, the effect of brand equity on various aspects of distribution strategy is a much underresearched topic in marketing. Hence, future research is urged to delve into this research area and explore other facets of the influence of brand equity on distribution strategy.

Conclusion

We conclude that brand equity has a powerful, direct but lagging impact on channel governance, in that higher brand equity leads to a less hierarchical channel governance structure (lower levels of forward vertical integration). Brand equity functions as an alternative governance mechanism that enables the firm to safeguard itself against downstream channel members' opportunism, and hence diffuses pressures for more vertical integration into distribution. In general, as firms accumulate brand equity they rely more on indirect distribution to facilitate the appropriation of due economic rents while leaning on their brands to effectively govern their channels without the need for deep involvement in direct distribution. Therefore, senior executives should be aware that investments in brand equity are dual investments directly in the brand and indirectly in the channel. This may make their risk/reward ratio superior to many other investment alternatives, especially investments in acquiring downstream channel members.

REFERENCES

Aaker, D. A., & Jacobson, R. (1994). The financial information content of perceived quality. Journal of Marketing Research, 191-201.

Agrawal, D., & Lal, R. (1995). Contractual arrangements in franchising: An empirical investigation. Journal of Marketing Research, 213-221.

Ailawadi, K. L., Lehmann, D. R., & Neslin, S. A. (2003). Revenue premium as an outcome measure of brand equity. Journal of Marketing, 67(4), 1-17.

Allenby, G. M. (1990). Hypothesis testing with scanner data: the advantage of Bayesian methods. Journal of Marketing Research, 379-389.

Anderson, E., & Weitz, B. (1992). The use of pledges to build and sustain commitment in distribution channels. Journal of Marketing Research, 18-34.

Antia, K. D., Zheng, X., & Frazier, G. L. (2013). Conflict management and outcomes in franchise relationships: the role of regulation. Journal of Marketing Research, 50(5), 577-589.

Antia, K. D., Mani, S., & Wathne, K. H. (2017). Franchisor-Franchisee Bankruptcy and the Efficacy of Franchisee Governance. Journal of Marketing Research.

Bagwell, K., & Staiger, R. W. (2011). What do trade negotiators negotiate about? Empirical evidence from the World Trade Organization. The American Economic Review, 101(4), 1238-1273.

Balestra, P., & Nerlove, M. (1966). Pooling cross section and time series data in the estimation of a dynamic model: The demand for natural gas. Econometrica: Journal of the Econometric Society, 585-612.

Barney, J. B. (2014). How marketing scholars might help address issues in resource-based theory. Journal of the Academy of Marketing Science, 42(1), 24-26.

Bateman, A. (2016). “The Guest Voices: New Supplier Strategies Revive Important Corporate Questions,” The Wall Street Journal, March 7, 2016.

Bell, D. R., Chiang, J., & Padmanabhan, V. (1999). The decomposition of promotional response: An empirical generalization. Marketing Science, 18(4), 504-526.

Besanko, D., Dubé, J. P., & Gupta, S. (2005). Own-brand and cross-brand retail pass-through. Marketing Science, 24(1), 123-137.

Biel, A. L., & Aaker, D. A. (Eds.). (1993). Brand Equity & Advertising: Advertising's Role in Building Strong Brands. Lawrence Erlbaum.

Binder, M., Hsiao, C., & Pesaran, M. H. (2005). Estimation and inference in short panel vector autoregressions with unit roots and cointegration. Econometric Theory, 21(04), 795-837.

Borah, A., & Tellis, G. J. (2016). Halo (Spillover) Effects in Social Media: Do Product Recalls of One Brand Hurt or Help Rival Brands?. Journal of Marketing Research, 53(2), 143-160.

Boulding, W., Lee, E., & Staelin, R. (1994). Mastering the mix: Do advertising, promotion, and sales force activities lead to differentiation?. Journal of Marketing Research, 159-172.

Box, G. E., & Pierce, D. A. (1970). Distribution of residual autocorrelations in autoregressive-integrated moving average time series models. Journal of the American Statistical Association, 65(332), 1509-1526.

Breivik, E., & Thorbjørnsen, H. (2008). Consumer brand relationships: an investigation of two alternative models. Journal of the Academy of Marketing Science, 36(4), 443-472.

Brexendorf, T. O., Bayus, B., & Keller, K. L. (2015). Understanding the interplay between brand and innovation management: findings and future research directions. Journal of the Academy of Marketing Science, 43(5), 548-557.

Brickley, J. A., & Dark, F. H. (1987). The choice of organizational form the case of franchising. Journal of Financial Economics, 18(2), 401-420.

Brown, J. R., Dev, C. S., & Lee, D. J. (2000). Managing marketing channel opportunism: the efficacy of alternative governance mechanisms. Journal of Marketing, 64(2), 51-65.

Bull, C. (1987). The existence of self-enforcing implicit contracts. The Quarterly Journal of Economics, 102(1), 147-159.

Canova, F. (2007). Methods for applied macroeconomic research (Vol. 13). Princeton University Press.

Canova, F., & Ciccarelli, M. (2013). Panel Vector Autoregressive Models: A Survey. In VAR Models in Macroeconomics–New Developments and Applications: Essays in Honor of Christopher A. Sims (pp. 205-246). Emerald Group Publishing Limited.

Canova, F., & Ciccarelli, M. (2004). Forecasting and turning point predictions in a Bayesian panel VAR model. Journal of Econometrics, 120(2), 327-359.

Capon, N., Farley, J. U., & Hoenig, S. (1990). Determinants of financial performance: a meta-analysis. Management Science, 36(10), 1143-1159.

Caselli, F., & Tesei, A. (2016). Resource windfalls, political regimes, and political stability. Review of Economics and Statistics, 98(3), 573-590.

Chakravarty, A., & Grewal, R. (2011). The stock market in the driver's seat! Implications for R&D and marketing. Management Science, 57(9), 1594-1609.

Choi, I. (2001). Unit root tests for panel data. Journal of International Money and Finance, 20(2), 249-272.

Combs, J. G., Ketchen, D. J., & Hoover, V. L. (2004). A strategic groups approach to the franchising–performance relationship. Journal of Business Venturing, 19(6), 877-897.

Coughlan, A. T., Anderson, E., Stern, L. W., & El-Ansary, A. I. (2006). Marketing channels (7th Edition). Upper Saddle River, NJ: Prentice Hall.

Davis, D. F., & Mentzer, J. T. (2008). Relational resources in interorganizational exchange: the effects of trade equity and brand equity. Journal of Retailing, 84(4), 435-448.

Dekimpe, M. G., & Hanssens, D. M. (1999). Sustained spending and persistent response: A new look at long-term marketing profitability. Journal of Marketing Research, 397-412.

DelVecchio, D., & Smith, D. C. (2005). Brand-extension price premiums: the effects of perceived fit and extension product category risk. Journal of the Academy of Marketing Science, 33(2), 184-196.

Doan, T., Litterman, R., & Sims, C. (1984). Forecasting and conditional projection using realistic prior distributions. Econometric reviews, 3(1), 1-100.

Economist (2016). “Keeping it under your hat,” Economist, April 16, 2016.

Fader, P. S., & Schmittlein, D. C. (1993). Excess behavioral loyalty for high-share brands: Deviations from the Dirichlet model for repeat purchasing. Journal of Marketing Research, 478-493.

Farris, P., Olver, J., & De Kluyver, C. (1989). The relationship between distribution and market share. Marketing Science, 8(2), 107-128.

Favaro, K., (2015). "Vertical Integration 2.0: An Old Strategy Makes a Comeback," Strategy+Business, (Autumn 2015), (accessed December 20, 2016), [available at http://www.strategy-business.com/blog/Vertical-Integration-2-0-An-Old-Strategy-Makes-a-Comeback?gko=41fe1]

Fischer, M., & Himme, A. (2017). The financial brand value chain: How brand investments contribute to the financial health of firms. International Journal of Research in Marketing, 34(1), 137-153.

Gallini, N. T., & Lutz, N. A. (1992). Dual distribution and royalty fees in franchising. Journal of Law, Economics, & Organization, 8(3), 471-501.

Gatignon, H., & Hanssens, D. M. (1987). Modeling marketing interactions with application to salesforce effectiveness. Journal of Marketing Research, 247-257.

Ghosh, M., & John, G. (1999). Governance value analysis and marketing strategy. Journal of Marketing, 131-145.

Ghosh, M., & John, G. (2009). When should original equipment manufacturers use branded component contracts with suppliers?. Journal of Marketing Research, 46(5), 597-611.

Gillis, W. E., Combs, J. G., & Ketchen, D. J. (2014). Using Resource-Based Theory to Help Explain Plural Form Franchising. Entrepreneurship Theory and Practice, 38(3), 449-472.

Granger, C. W. (1969). Investigating causal relations by econometric models and cross-spectral methods. Econometrica: Journal of the Econometric Society, 424-438.

Granger, C. W. (1980). Testing for causality: a personal viewpoint. Journal of Economic Dynamics and control, 2, 329-352.

Granger, C. W., & Newbold, P. (1974). Spurious regressions in econometrics. Journal of econometrics, 2(2), 111-120.

Granger, C. W. (2004). Time series analysis, cointegration, and applications. American Economic Review, 421-425.

Grewal, R., Chakravarty, A., & Saini, A. (2010). Governance mechanisms in business-to-business electronic markets. Journal of Marketing, 74(4), 45-62.

Hamilton, J. D. (1994). Time series analysis (Vol. 2). Princeton: Princeton university press.

Hansen, M. H., Perry, L. T., & Reese, C. S. (2004). A Bayesian operationalization of the resource-based view. Strategic Management Journal, 25(13), 1279-1295.

Heide, J. B. (1994). Interorganizational governance in marketing channels. Journal of Marketing, 71-85.

Heide, J. B., & John, G. (1988). The role of dependence balancing in safeguarding transaction-specific assets in conventional channels. Journal of Marketing, 20-35.

Heide, J. B., & John, G. (1992). Do norms matter in marketing relationships?. Journal of Marketing, 32-44.

Hewett, K., Rand, W., Rust, R. T., & van Heerde, H. J. (2016). Brand buzz in the echoverse. Journal of Marketing, 80(3), 1-24.

Hitt, M. A., Harrison, J. S., & Ireland, R. D. (2001). Mergers & acquisitions: A guide to creating value for stakeholders. Oxford University Press.

Hoeffler, S., & Keller, K. L. (2003). The marketing advantages of strong brands. Journal of Brand Management, 10(6), 421-445.

Holtz-Eakin, D., Newey, W., & Rosen, H. S. (1988). Estimating vector autoregressions with panel data. Econometrica: Journal of the Econometric Society, 1371-1395.

Hoos, S. (1959). The advertising and promotion of farm products—some theoretical issues. Journal of Farm Economics, 41(2), 349-363.

Houston, M. B., & Johnson, S. A. (2000). Buyer–supplier contracts versus joint ventures: Determinants and consequences of transaction structure. Journal of Marketing Research, 37(1), 1-15.

IHS Economics. (2016). Franchise Business Economic Outlook for 2016: International Franchise Association Educational Foundation, (accessed January 23, 2017), [available at http://emarket.franchise.org/FranchiseOutlookJan2016.pdf].

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. Journal of Econometrics, 115(1), 53-74.

Ishida, H., Spilerman, S., & Su, K. H. (1997). Educational credentials and promotion chances in Japanese and American organizations. American Sociological Review, 866-882.

Jeon, J. Q., & Ligon, J. A. (2011). How much is reasonable? The size of termination fees in mergers and acquisitions. Journal of Corporate Finance, 17(4), 959-981.

Jindal, R. (2011). Reducing the size of internal hierarchy: The case of multi-unit franchising. Journal of Retailing, 87(4), 549-562.

Johansen, S. (1995). A statistical analysis of cointegration for I (2) variables. Econometric Theory, 11(01), 25-59.

John, G., & Weitz, B. A. (1988). Forward integration into distribution: an empirical test of transaction cost analysis. Journal of Law, Economics, & Organization, 4(2), 337-355.

Kacker, M., Dant, R. P., Emerson, J., & Coughlan, A. T. (2016). How Firm Strategies Impact Size of Partner-Based Retail Networks: Evidence From Franchising. Journal of Small Business Management, 54(2), 506-531.

Kang, C., Germann, F., & Grewal, R. (2016). Washing Away Your Sins? Corporate Social Responsibility, Corporate Social Irresponsibility, and Firm Performance. Journal of Marketing, 80(2), 59-79.

Kaufmann, P. J., & Lafontaine, F. (1994). Costs of control: The source of economic rents for McDonald's franchisees. Journal of Law and Economics, 417-453.

Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. Journal of Marketing, 1-22.

Keller, K. L. (2003). Strategic brand management (Vol. 11998). New Jersey: Prentice Hall.

Kiviet, J. F. (1995). On bias, inconsistency, and efficiency of various estimators in dynamic panel data models. Journal of Econometrics, 68(1), 53-78.

Klein, B. (2002). “The Role of Incomplete Contracts in Self-Enforcing Relationships.” In The Economics of Contracts: Theories and Applications, ed. Eric Brousseau and Jean-Michel Glachant, 59–71. Cambridge: Cambridge University Press.

Klein, B. (1985). Self-enforcing contracts. Zeitschrift für die gesamte Staatswissenschaft/Journal of Institutional and Theoretical Economics, (H. 4), 594-600.

Lafontaine, F., & Shaw, K. L. (2005). Targeting managerial control: evidence from franchising. *RAND Journal of Economics*, 131-150.

Lafontaine, F. (1992). Agency theory and franchising: some empirical results. The RAND Journal of Economics, 263-283.

Lafontaine, F. (1995). A critical appraisal of data sources on franchising. Journal of Marketing Channels, 4(1-2), 5-25.

Lal, R., & Narasimhan, C. (1996). The inverse relationship between manufacturer and retailer margins: A theory. Marketing Science, 15(2), 132-151.

Leeper, E. M., Sims, C. A., Zha, T., Hall, R. E., & Bernanke, B. S. (1996). What does monetary policy do?. Brookings papers on economic activity, 1996(2), 1-78.

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. Journal of Econometrics, 108(1), 1-24.

Lindblom, A., & Tikkanen, H. (2010). Knowledge creation and business format franchising. Management Decision, 48(2), 179-188.

Ljung, G. M., & Box, G. E. (1978). On a measure of lack of fit in time series models. Biometrika, 65(2), 297-303.

Mackey, T. B., Barney, J. B., & Dotson, J. P. (2016). Corporate diversification and the value of individual firms: A Bayesian approach. Strategic Management Journal.

Maddala, G. S. (1992). Introduction to Econometrics. New York: Macmillan.

Mathewson, G. F., & Winter, R. A. (1985). The economics of franchise contracts. Journal of Law and Economics, 28(3), 503-526.

Mazodier, M., & Merunka, D. (2012). Achieving brand loyalty through sponsorship: the role of fit and self-congruity. Journal of the Academy of Marketing Science, 40(6), 807-820.

Mela, C. F., Gupta, S., & Lehmann, D. R. (1997). The long-term impact of promotion and advertising on consumer brand choice. Journal of Marketing research, 248-261.28, 503.

Michael, S. C., & Moore, H. J. (1995). Returns to franchising. Journal of Corporate Finance, 2(1), 133-155.

Minkler, A. P., & Park, T. A. (1994). Asset specificity and vertical integration in franchising. Review of industrial organization, 9(4), 409-423.

Mizik, N. (2014). Assessing the total financial performance impact of brand equity with limited time-series data. Journal of Marketing Research, 51(6), 691-706.

Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2005). Wealth destruction on a massive scale? A study of acquiring-firm returns in the recent merger wave. Journal of Finance, 60(2), 757-782.

Montgomery, D. B. (1975). New product distribution: An analysis of supermarket buyer decisions. Journal of Marketing Research, 255-264.

Nerlove, M., & Arrow, K. J. (1962). Optimal advertising policy under dynamic conditions. Economica, 129-142.

Nickerson, J. A., & Silverman, B. S. (2003). Why firms want to organize efficiently and what keeps them from doing so: Inappropriate governance, performance, and adaptation in a deregulated industry. Administrative Science Quarterly, 48(3), 433-465.

Norton, S. W. (1988a). Franchising, brand name capital, and the entrepreneurial capacity problem. Strategic Management Journal, 9(S1), 105-114.

Norton, S. W. (1988b). An empirical look at franchising as an organizational form. Journal of Business, 197-218.

Phillips, P. C. (1986). Understanding spurious regressions in econometrics. Journal of Econometrics, 33(3), 311-340.

Raassens, N., Wuyts, S., & Geyskens, I. (2012). The market valuation of outsourcing new product development. Journal of Marketing Research, 49(5), 682-695.

Rao, H. (1994). The social construction of reputation: Certification contests, legitimation, and the survival of organizations in the American automobile industry: 1895–1912. Strategic Management Journal, 15(S1), 29-44.

Rigobon, R., & Stoker, T. M. (2007). Estimation with censored regressors: basic issues. International Economic Review, 48(4), 1441-1467.

Rindfleisch, A., & Heide, J. B. (1997). Transaction cost analysis: Past, present, and future applications. Journal of Marketing, 30-54.

Rossi, P. E., & Allenby, G. M. (1993). A Bayesian approach to estimating household parameters. Journal of Marketing Research, 171-182.

Rumelt, R. P. (1974). Strategy, structure, and economic performance.

Russell, G., & Kamakura, W. A. (1994). Understanding brand competition using micro and macro scanner data. Journal of Marketing Research, 31 (May). 289-303.

Rust, R. T., Lemon, K. N., & Zeithaml, V. A. (2004). Return on marketing: Using customer equity to focus marketing strategy. Journal of Marketing, 68(1), 109-127.

Schultz, H., & Jones Yang, D. (1997). Pour your heart into it: How Starbucks built a company one cup at a time. Hyperion.

Scott Jr, F. A. (1995). Franchising vs. company ownership as a decision variable of the firm. Review of Industrial Organization, 10(1), 69-81.

Scott, S., & Spell, C. (1998). Factors for new franchise success. MIT Sloan Management Review, 39(3), 43.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). Experimental and quasi-experimental designs for generalized causal inference. Houghton, Mifflin and Company.

Shane, S. A. (1998). Research notes and communications: making new franchise systems work. Strategic Management Journal, 19(7), 697-707.

Shane, S., Shankar, V., & Aravindakshan, A. (2006). The effects of new franchisor partnering strategies on franchise system size. Management Science, 52(5), 773-787.

Shane, S., & Foo, M. D. (1999). New firm survival: Institutional explanations for new franchisor mortality. Management Science, 45(2), 142-159.

Shankar, V., Azar, P., & Fuller, M. (2008). Practice Prize Paper—BRAN* EQT: A Multicategory Brand Equity Model and Its Application at Allstate. Marketing Science, 27(4), 567-584.

Sinapuelas, I. C. S., Wang, H. M. D., & Bohlmann, J. D. (2015). The interplay of innovation, brand, and marketing mix variables in line extensions. Journal of the Academy of Marketing Science, 43(5), 558-573.

Srinivasan, R. (2006). Dual distribution and intangible firm value: Franchising in restaurant chains. Journal of Marketing, 70(3), 120-135.

Srivastava, R. K., Shervani, T. A., & Fahey, L. (1998). Market-based assets and shareholder value: A framework for analysis. Journal of Marketing, 2-18.

Steenkamp, J. B. E., Nijs, V. R., Hanssens, D. M., & Dekimpe, M. G. (2005). Competitive reactions to advertising and promotion attacks. Marketing Science, 24(1), 35-54.

Stump, R. L., & Heide, J. B. (1996). Controlling supplier opportunism in industrial relationships. Journal of Marketing Research, 431-441.

Tavassoli, N. T., Sorescu, A., & Chandy, R. (2014). Employee-based brand equity: Why firms with strong brands pay their executives less. Journal of Marketing Research, 51(6), 676-690.

Taylor, V. A., & Bearden, W. O. (2002). The effects of price on brand extension evaluations: The moderating role of extension similarity. Journal of the Academy of Marketing Science, 30(2), 131-140.

Telser, L. G. (1980). A theory of self-enforcing agreements. Journal of Business, 27-44.

Tellis, G.J. (2017). Interesting and impactful research: on phenomena, theory, and writing. Journal of the Academy of Marketing Science, 45(1), 1-6.

Vinhas, A. Sa., & Anderson, E. (2005). How potential conflict drives channel structure: Concurrent (direct and indirect) channels. Journal of Marketing Research, 42(4), 507-515.

Wathne, K. H., & Heide, J. B. (2000). Opportunism in interfirm relationships: Forms, outcomes, and solutions. Journal of Marketing, 64(4), 36-51.

Wathne, K. H., & Heide, J. B. (2004). Relationship governance in a supply chain network. Journal of Marketing, 68(1), 73-89.

Williamson, O. E., & Ouchi, W. G. (1981). The Markets and Hierarchies Program of Research. S. 347–370 in: Van de Ven, AH/Joyce, WF. Perspectives on Organization Design and Behaviour. New York.

Wilson, A. E., Giebelhausen, M. D., & Brady, M. K. (2017). Negative word of mouth can be a positive for consumers connected to the brand. Journal of the Academy of Marketing Science, 45(4), 534-547.

Windsperger, J. (2004). Centralization of franchising networks: evidence from the Austrian franchise sector. Journal of Business Research, 57(12), 1361-1369.

Worthen, C., & Scheck, J. (2009). “Companies More Prone to Go 'Vertical',” Wall Street Journal, (November 2009), (accessed December 27, 2016), [available at http://www.wsj.com/articles/SB125954262100968855]

Wu, L. (1999). The pricing of a brand name product: Franchising in the motel services industry. Journal of Business Venturing, 14(1), 87-102.

Yoo, B., Donthu, N., & Lee, S. (2000). An examination of selected marketing mix elements and brand equity. Journal of the Academy of Marketing Science, 28(2), 195-211.

Zellner, A. (1962). An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias. Journal of the American statistical Association, 57(298), 348-368.

FOOTNOTES

1. Governance structures are institutional structures that firms put in place for governing interorganizational relationships such as market, hierarchy, and hybrid governance structures (Heide, 1994; Williamson & Ouchi, 1981; Houston & Johnson, 2000). Governance mechanisms are means for managing interorganizational relationships in the form of contractual terms, transactional controls, investments, measures, or norms. Examples of these mechanisms include dependence balancing by offsetting investments, partner selection, market participation, relational norms, profit sharing, incentive structures, monitoring, supplier qualification programs, trust and commitment building, and disciplinary procedures. For more details on this, see Williamson (1989), Heide (1994), Grewal, Chakravarty, & Saini (2010), Brown, Dev, & Lee (2000), Wathne & Heide (2004), and Heide & John (1992).

2. Gallini and Lutz (1992) provide a game theoretic signaling argument suggesting that when brand equity is low, firms own a portion of the channel to signal their commitment to the brand to their partners. Then, as brand equity increases, vertical integration decreases.

3. An exception is Norton (1988b). He argues that when brand equity is high, a brand owner forfeits more economic gains to shirking managers than to independent agents. Hence, as brand equity increases, vertical integration should decrease.

4. Fischer and Himme (2017) provide a summary of existing empirical evidence on this.

5. Consistent with previous research (e.g., Bagwell & Staiger, 2011; Caselli & Tesei, 2016; Ishida, Spilerman, & Su, 1997; Jeon & Ligon, 2011), we do not include observations with missing/censored-at-zero dependent variables in our sample to obtain consistent estimators (Maddala, 1992; Rigobon & Stoker, 2007).

6. For robustness, we also ran our BPVARX model on the full sample including observations with missing/censored-at-zero dependent variable. The results remained very consistent under both prior distributions (Web Appendices O and P).

Table 1

Overview of Research in Marketing on the Impact of Brand Equity on Distribution

Study	Context	Channel Coordination / Governance	Channel Member Under Study	Brand Equity Operationalization	Key Relevant Findings
Montgomery, 1975	Grocery Store / Supermarket	Channel Coordination	Brand Seller (Downstream firm)	Advertising (formative indicator).	Stronger brands have better chance of being accepted at stores and in gaining shelf-space.
Farris, Olver, De Kluyver, 1989	Grocery Store / Supermarket	Channel Coordination	Brand Seller (Downstream firm)	% of survey subjects who would choose the brand over rivals (reflective indicator).	Retailers provide better in-store merchandising and stocking to stronger brands.
Fader & Schmittlein, 1993	Grocery Store / Supermarket	Channel Coordination	Brand Seller (Downstream firm)	Market share (reflective indicator).	Stronger brands have higher availability at retailers. Retailers who carry few brands carry those with higher brand equity.
Lal & Narasimhan, 1996	Not Applicable (Analytical model)	Channel Coordination	Brand Seller (Downstream firm)	Advertising (formative indicator)	Retailers are willing to accept lower margins on stronger brands because they see them as drivers of store traffic. Retailers are more likely to advertise stronger brands because customers use them to gauge the store's overall price levels.
Bell, Chaing, & Padmanabhan, 1999	Grocery Store / Supermarket	Channel Coordination	Brand Seller (Downstream firm)	Average number of purchases of the brand per consumer (reflective indicator)	During promotions, retailers stockpile stronger brands more than weaker brands.
Besanko, Dubé, & Gupta, 2005	Grocery Store / Supermarket	Channel Coordination	Brand Seller (Downstream firm)	Market share (reflective indicator)	Stronger brands receive higher promotion pass-through (by retailers) than weaker brands.
This Study	45 industries	Channel Governance	Brand Owner (Upstream firm)	Advertising (formative indicator), Brand Ranking (reflective indicator)	As brand equity increases, firms rely less on forward vertical integration. This is because brand equity functions as an alternative channel governance mechanism that solves many channel issues, via contractual self-enforcement, which provides an effective safeguard against downstream channel partners' opportunism.

Table 2
Existing Empirical Studies vs. Our Study

	Method						Theory	
Study	**Measure of Brand Equity**	**Controlled for Endogeneity**	**Modeled Lagged Effects**	**Controlled for Unobserved Heterogeneity**	**Examined Causality**	**Investigated Reverse Causality**	**Theoretical Lens**	**Impact of BE on VI**
Brickley & Dark, 1987	Repeat Customers (reflective indicator)						Agency Theory	+
Norton, 1988a	Travel Intensity (reflective indicator)						Transaction Cost Theory	+
Minkler & Park, 1994	Market Value minus Book Value (reflective indicator)			X			Transaction Cost Theory	+
Nickerson & Silverman, 2003	Advertising (formative indicator)						Transaction Cost Theory	+
Lafontaine & Shaw, 2005	Advertising (formative indicators)			X			Agency Theory	+
This Study	Advertising (formative), Brand Ranking (reflective)	X	X	X	X	X	Theory of Self-enforcing contracts, Transaction Costs Theory	-

BE: Brand Equity; VI: Forward Vertical Integration

Table 3

Variables and Measures

Variable	Symbol	Measure
Dependent Variable		
Degree of Vertical Integration	*VI*	Percentage of company-owned units in the overall chain.
Independent Variables		
Advertising Fee	*Ad*	Percentage of sales contributed by the franchisees to the brand advertising fund.
Media Recognition	*Media*	*Entrepreneur Magazine's Franchise500* annual ranking coded in reverse order (501-Rank).
Control Variables		
Chain Size	*lnSize*	The natural logarithm of the total number of outlets in the chain (franchised + company-owned).
Industry-Specific Effects	*Industry*	A categorical variable (dummy coded) representing the industry the company operates in as classified by *Bond's Guide.*
Business Development Time	*BDT*	Period in years between the year of business inception and the start of franchising.
Geographic Scope	*International*	A dummy variable that is set to 1 if the brand has one outlet overseas and 0 otherwise.
Chain Age	*Age*	The number of years from the start of franchising till the data collection year.
Financing Support	*Financing*	A dummy variable that is set to "0" if the franchisor provides no financing option to its franchisees and "1" otherwise.

Table 4

Descriptive Statistics and Correlations

	Variable	1	2	3	4	5	6	7	8	9
1.	VI	1								
2.	Ad	0.2427	1							
3.	BDT	0.2617	-0.0997	1						
4.	Media	0.0066	0.2188	0.0681	1					
5.	Age	0.0174	0.2448	-0.0895	0.2641	1				
6.	lnSize	0.0231	0.2405	0.1359	0.7369	0.5311	1			
7.	Industry	-0.0028	-0.1354	0.1626	0.0004	-0.1133	-0.0059	1		
8.	International	-0.1425	0.1133	0.0028	0.2442	0.288	0.3742	0.0082	1	
9.	Financing	-0.1111	0.0113	0.0059	-0.0548	-0.0717	-0.0987	0.0653	-0.0626	1
	M	21.7113	1.6941	8.9685	286.6457	18.0561	4.3487	19.9798	0.2991	0.5756
	SD	25.6391	1.6946	13.8321	144.2307	12.275	1.7547	11.6702	0.4579	0.4943
	n	6,272	6,081	6,285	1,493	6,292	6,273	6,290	6,282	6,265

Figure 1: The Dynamic Impact of Brand Equity on Channel Governance

Generalized Impulse Response Functions for the Effect of a Shock in Brand Equity on Vertical Integration

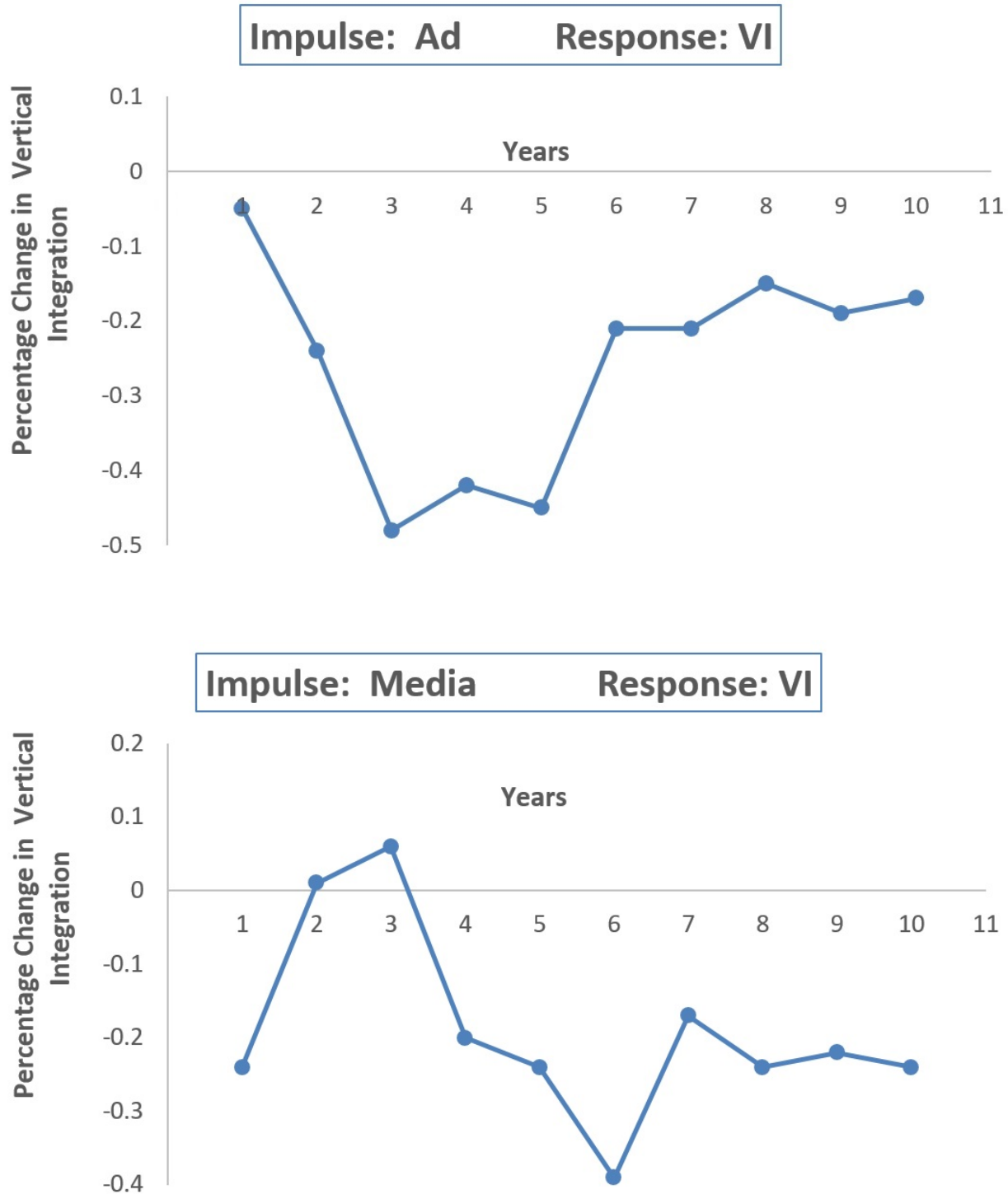


Table 5

Results of the Autoregressive Distributed Lag Model

Dependent Variable Degree of Vertical Integration (VI)	Unbalanced Panel		Balanced Sub-Panel	
	Betas	**SE**	**Betas**	**SE**
Independent Variables				
Degree of Vertical Integration Lags				
VI_{t-1}	0.7798†	(0.1225)	0.7519†	(0.1365)
VI_{t-2}	0.0422	(0.1138)	-0.1598	(0.1518)
VI_{t-3}	0.1760**	(0.0832)	0.6862*	(0.3578)
VI_{t-4}	-0.0590	(0.0765)	-0.1386	(0.2259)
VI_{t-5}	0.0363**	(0.0161)	-0.1587†	(0.0236)
Advertising Fee Lags				
ΔAd_{t-1}	-0.8478†	(0.2070)	-0.6334	(0.3833)
ΔAd_{t-2}	-1.1784*	(0.6710)	-1.2546*	(0.7444)
ΔAd_{t-3}	-0.3605†	(0.0768)	-1.5342**	(0.7627)
ΔAd_{t-4}	-0.3991	(0.4074)	-1.1245	(0.9743)
ΔAd_{t-5}	1.0137†	(0.2773)	1.0728†	(0.2007)
Media Recognition Lags				
$\Delta Media_{t-1}$	0.0010	(0.0032)	0.0011	(0.0050)
$\Delta Media_{t-2}$	0.0011	(0.0075)	0.0007	(0.0115)
$\Delta Media_{t-3}$	-0.0025	(0.0022)	-0.0052**	(0.0024)
$\Delta Media_{t-4}$	-0.0037	(0.0031)	0.0002	(0.0033)
$\Delta Media_{t-5}$	-0.0057*	(0.0031)	-0.0039	(0.0042)
Control Variables				
Business Development Time	-0.0018	(0.0176)	-0.0151	(0.0150)
Chain Age	-0.0721***	(0.0258)	-0.0755*	(0.0390)
Geographic Scope	-0.1794	(0.6363)	0.0040	(0.8305)
Financing Support	0.8525	(0.6208)	0.9328	(0.7419)
Chain Size	0.3256*	(0.1747)	0.0557	(0.3650)
Industry Effect	0.0135	(0.0272)	0.0477	(0.0326)
Intercept	-1.1452	(1.2287)	0.2376	(2.5778)
Adjusted R-square	95.16%		94.93%	
(F-statistic, P-value)	(165.685, p<0.00001)		(123.269, p<0.00001)	
Schwarz Information Criterion	5.91		6.15	

** p<0.1; ** p<0.05; *** p<0.01; † p<0.001*

Figure 2: The Dynamic Impact of Channel Governance on Brand Equity

Generalized Impulse Response Functions for the Effect of a Shock in Vertical Integration on Brand Equity

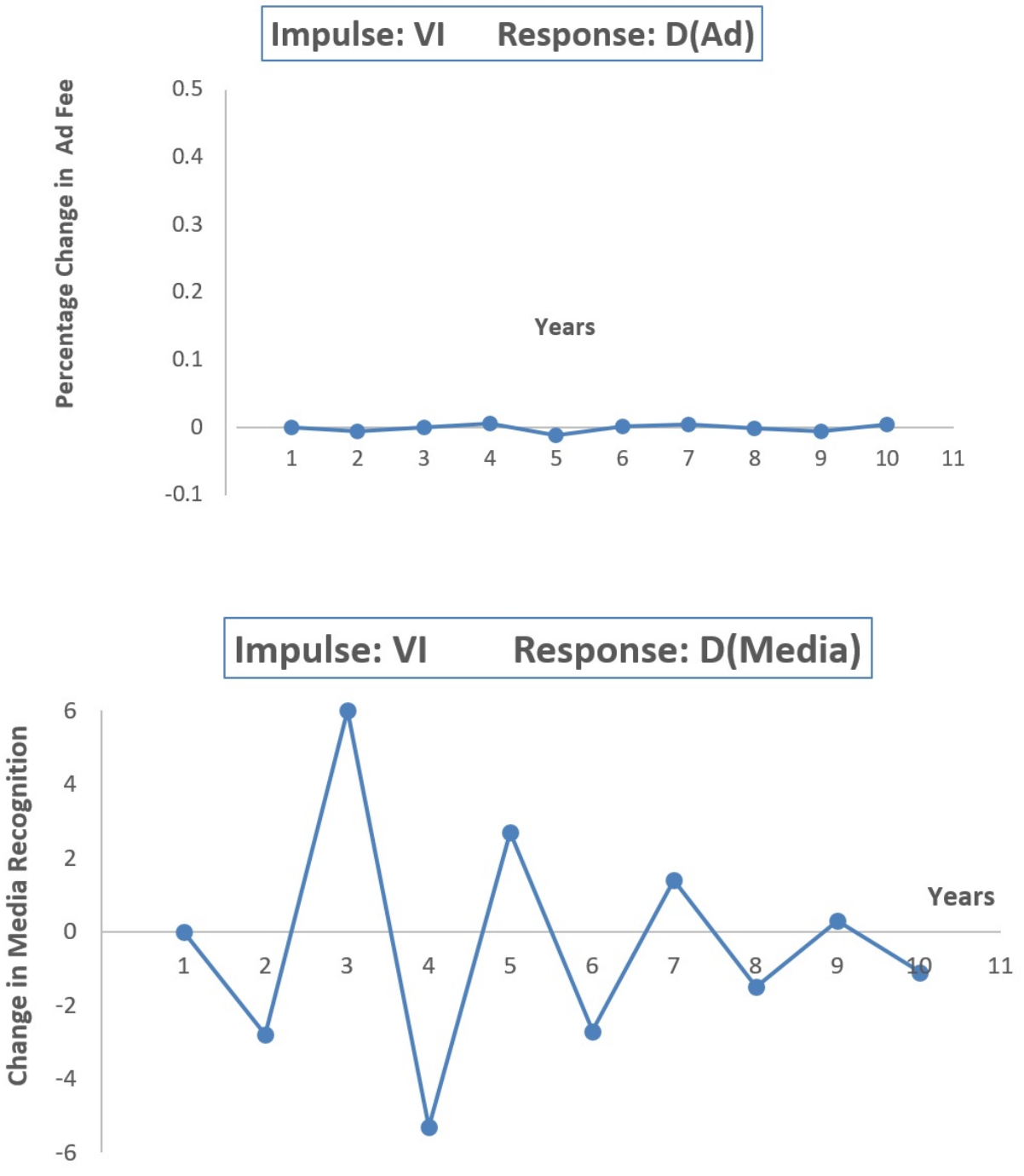
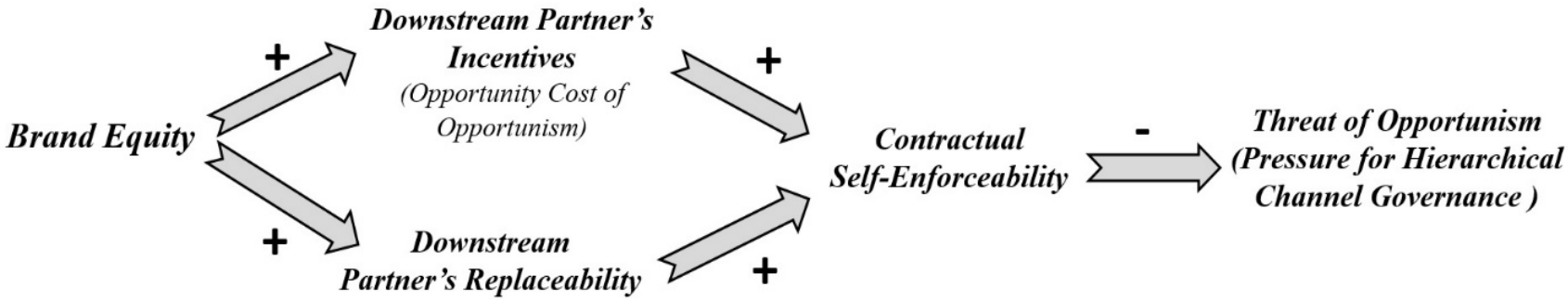


Table 6

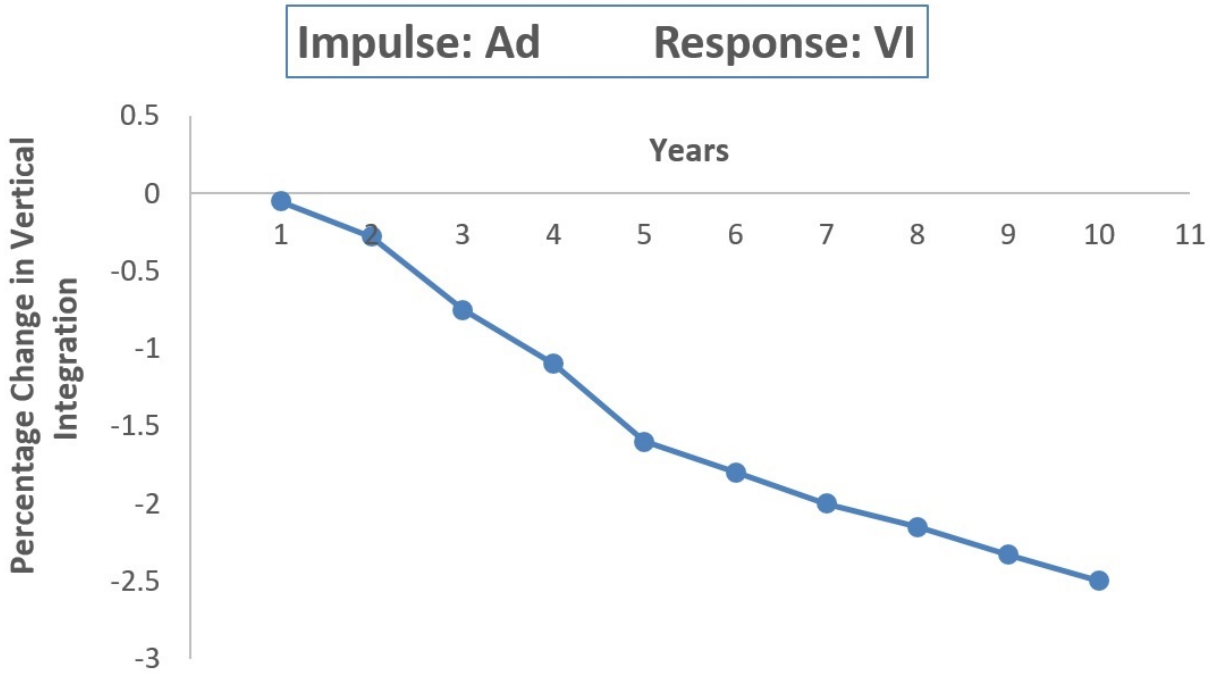
Managerial Takeaways

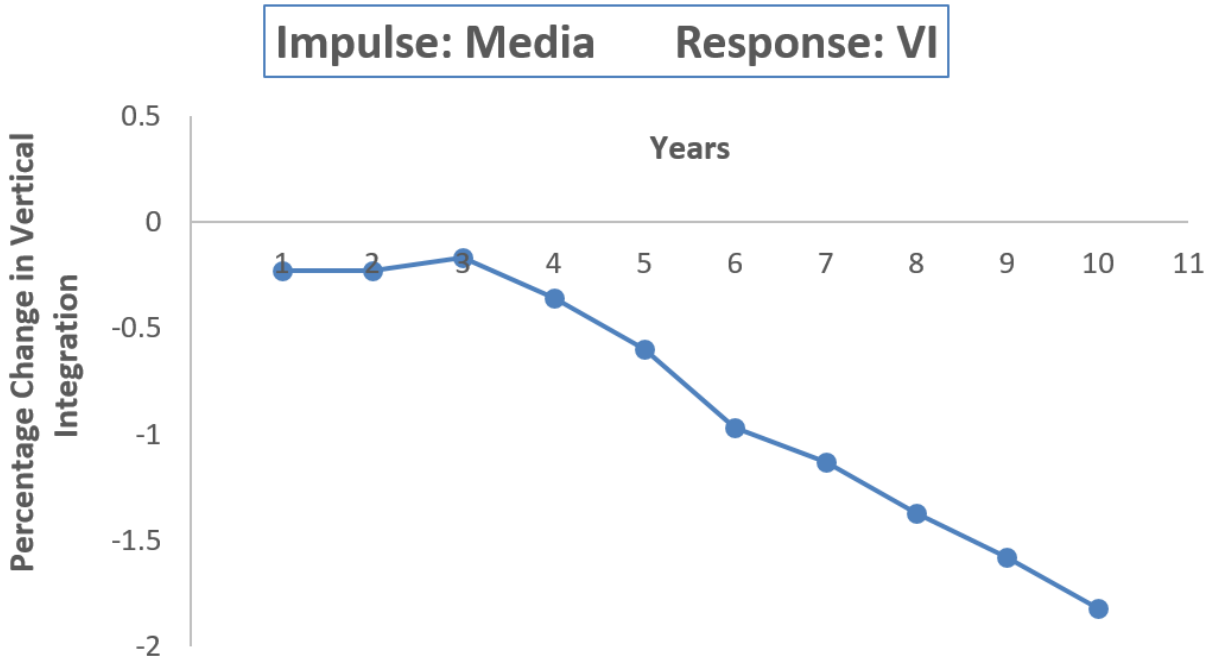
Managerial Question	Scholarly Advice	Underlying Logic
Selling brand building initiatives to senior management is challenging due to the intangibility and long-term nature of the beneficial outcomes of such investments, how can marketing managers better sell brand building initiatives?	This study helps marketing managers in selling brand building initiatives by drawing attention an under-recognized, strategic benefit for brand equity: By strengthening its brand equity, the firm increases its influence on its distribution partners which, in turn, improves channel coordination and consequently boosts financial performance.	Brand equity alleviates the channel coordination problem by functioning as an alternative channel governance mechanism that effectively curbs downstream members' opportunism through contractual self-enforcement.
Vertical integration is witnessing a renewed interest from practitioners and it is fashionable once again, should firms pursue vertical integration?	We advise against unnecessary forward vertical integration, especially in situations where the firm enjoys a moderate to high level of brand equity.	Firms with strong brand names can lean on their brands to safeguard themselves against downstream members' opportunism and to govern their distribution channels effectively without the need for extensive involvement in direct distribution.
When it comes to marketing investments decision making, how do brand investments compare with other marketing investment alternatives, especially investments in acquiring downstream channel members?	Investments in brand equity may offer a lower risk/reward ratio and a better hedge against uncertainty because of their nature as dual investments directly in the brand and indirectly in the channel.	When investing in its brand, the firm may enhance its channel performance and reduce the need for investing in forward vertical integration. This is because brand equity functions as an alternative governance mechanism that solves many channel issues through contractual self-enforcement.

Appendix A: An Illustrative Diagram on How Higher Brand Equity Leads to Less Hierarchical Channel Governance

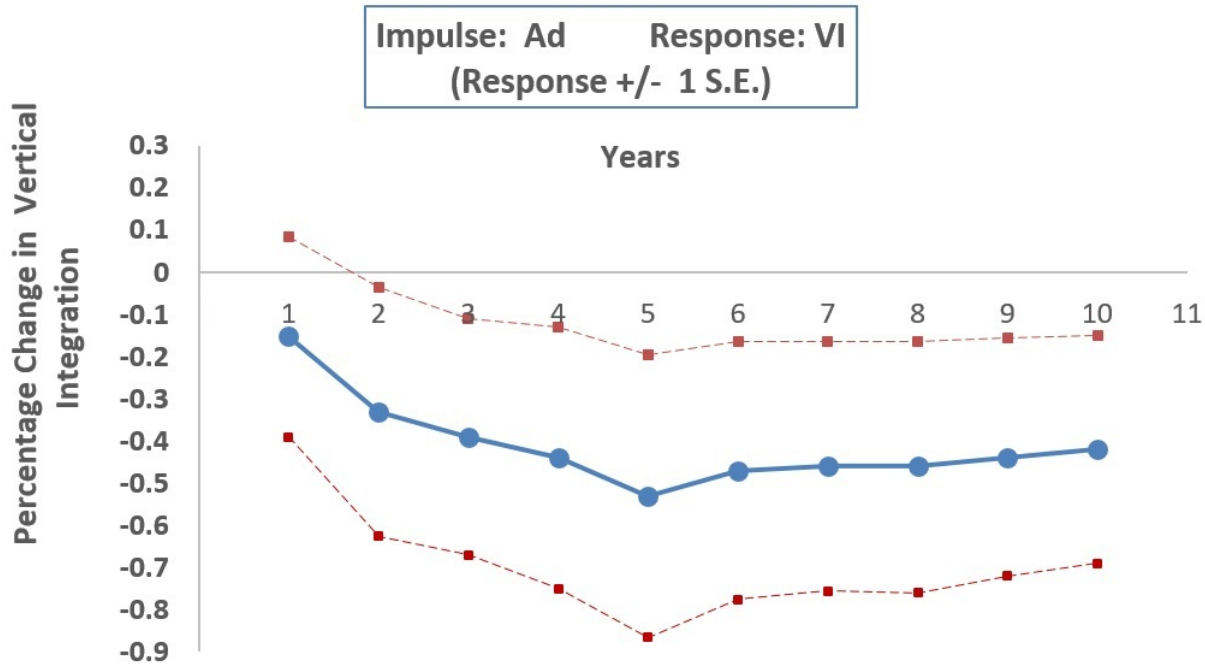


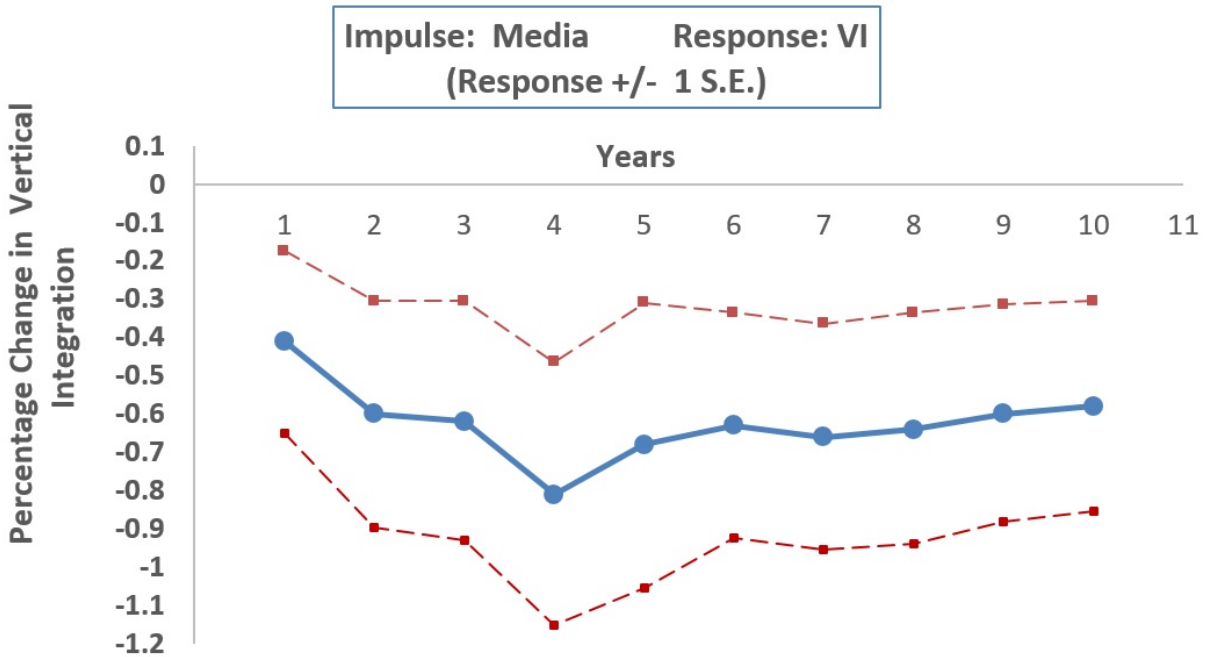
Appendix B: Accumulated GIRFs for the Effect of a Shock in Brand Equity on Vertical Integration



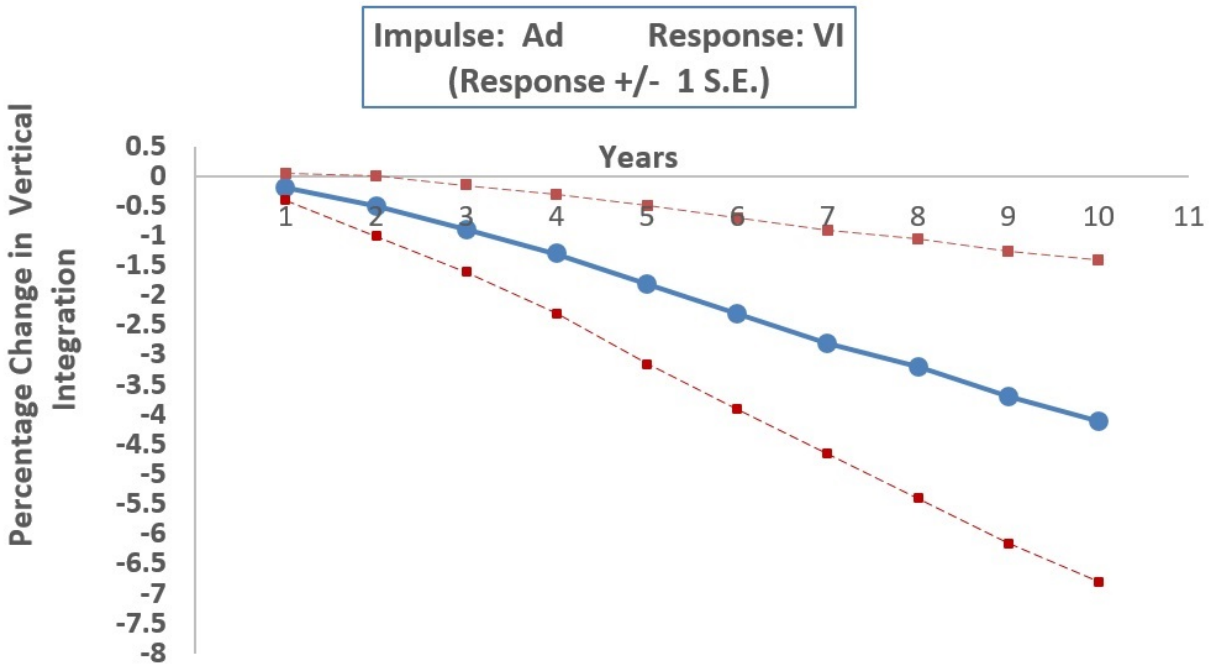


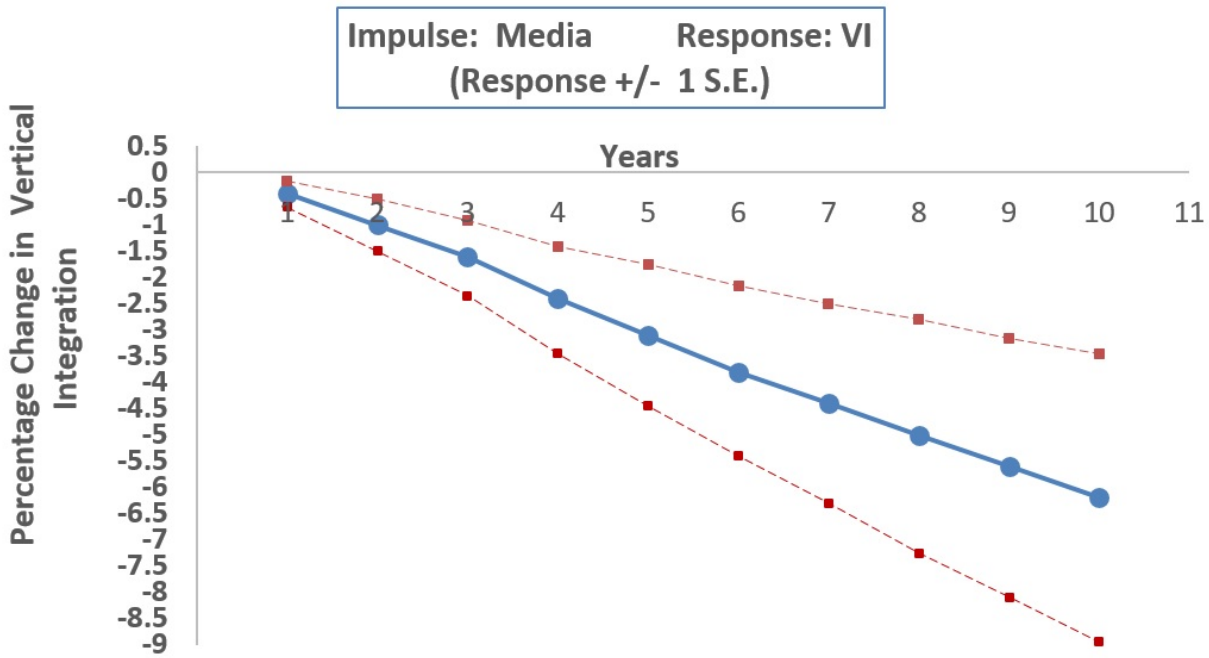
Appendix C: Generalized IRFs for the Unrestricted PVAR (L=4)



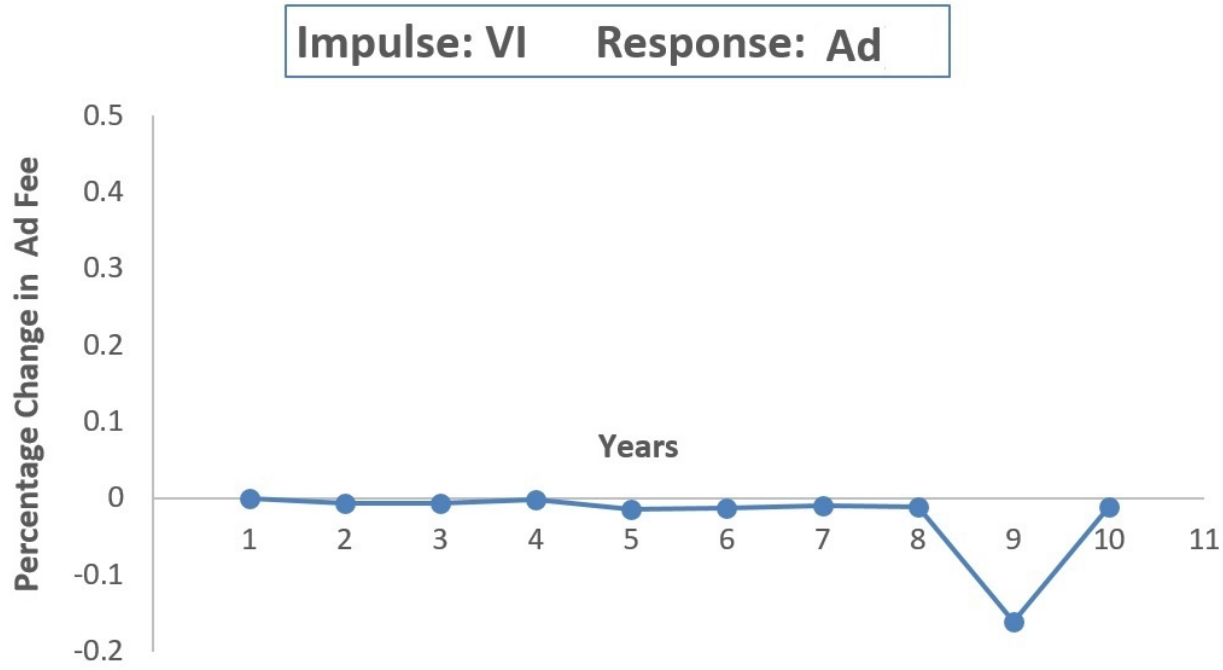


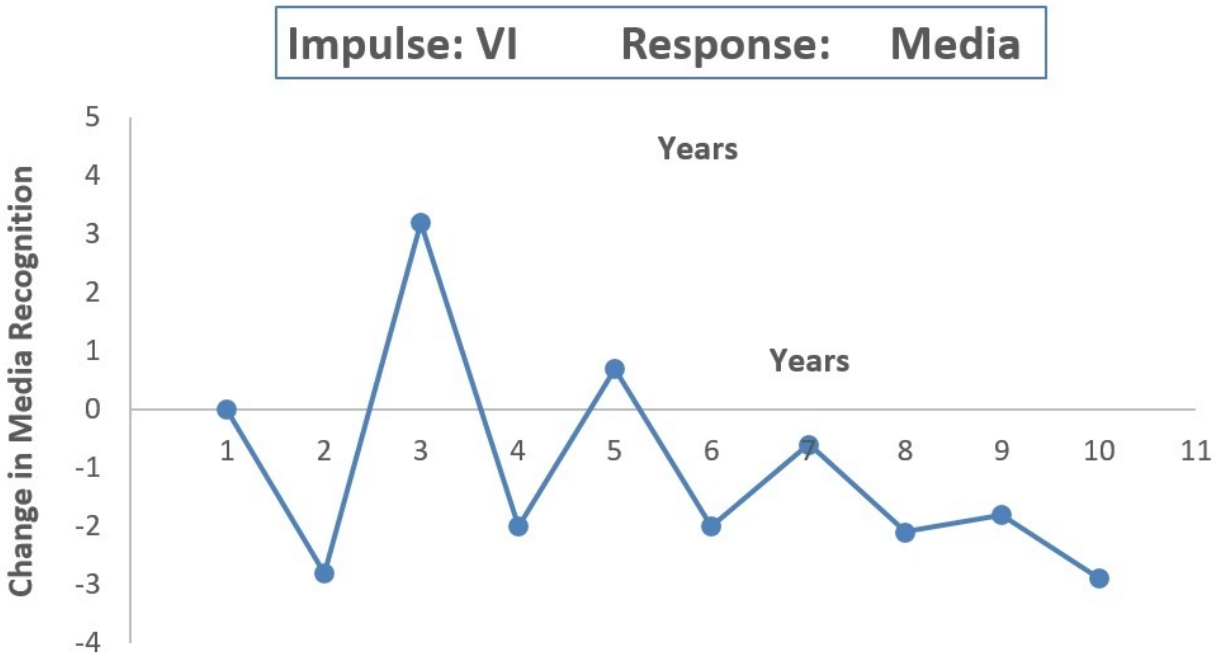
Appendix D: Accumulated GIRFs for the Unrestricted PVAR (L=4)



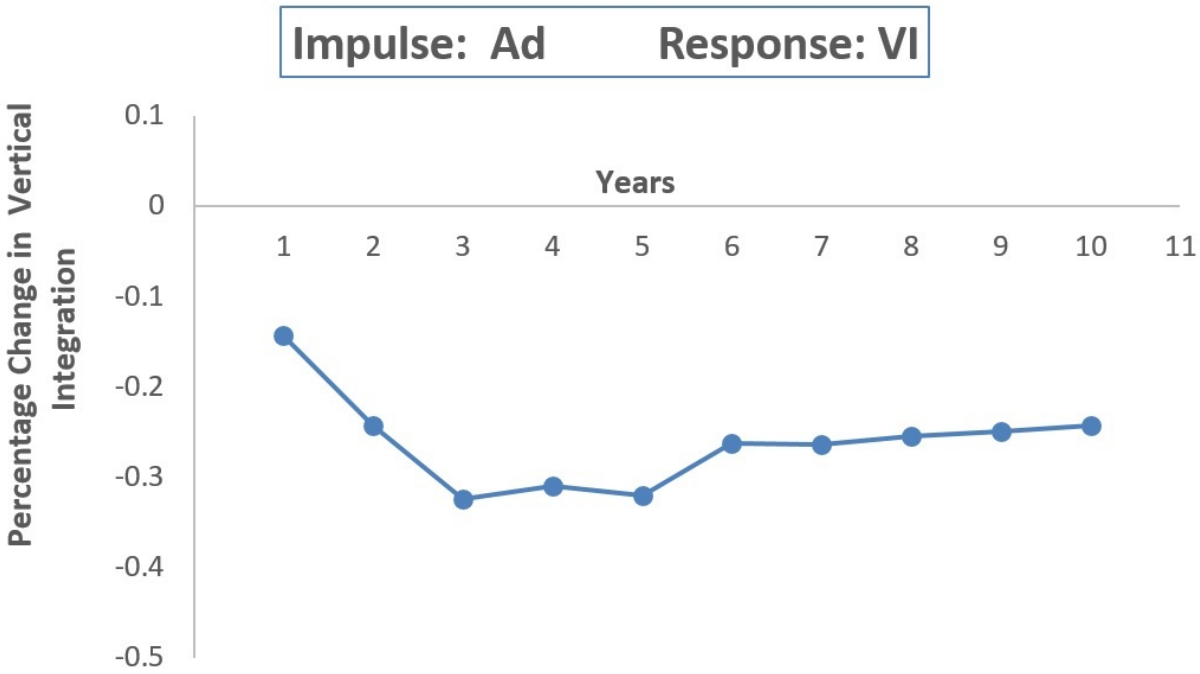


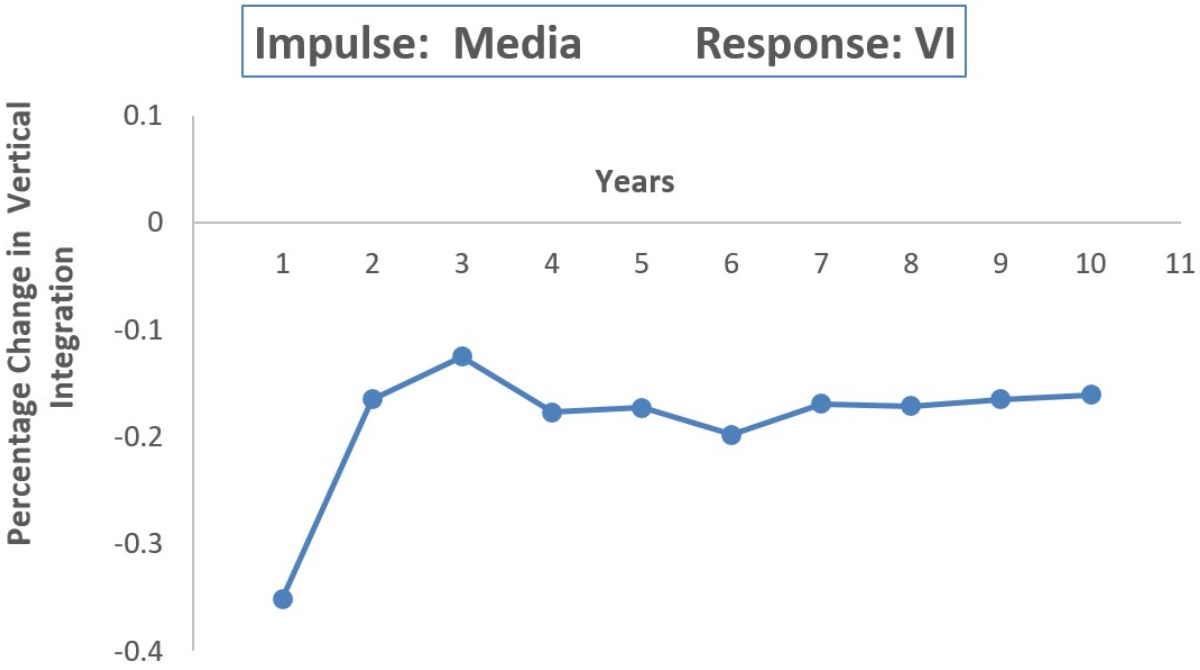
Appendix E: Accumulated GIRFs for the Effect of a Shock in Vertical Integration on Brand Equity





Appendix F: Generalized Impulse Response Functions for BPVARX (Minnesota prior)





Web Appendix A: Sample Breakdown by Industry (Bond's Classification)

Industry	Percentage
Auto Products and Services	6.76
Auto/ Truck Rental	1.40
Building and Remodeling	4.68
Business: Accounting/ Credit/ Collection	1.60
Business: Advertising and Promotion	0.86
Business: Telecommunications/Miscellaneous	2.23
Child Development	3.49
Education/Personal Development/ Training	2.37
Employment and Personnel	3.07
Donuts/ Cookies/ Bagels	3.02
Coffee	1.35
Ice-cream/ Yogurt/Smoothies	2.19
Quick Service/ Take out	14.36
Restaurant/ Family Style	6.26
Specialty Foods	3.87
Hairstyling Salons	1.22
Health/ Fitness/ Beauty	3.06
Laundry and Dry Cleaning	0.97
Lawn and Garden	1.18
Lodging	2.33
Maid Services and Home Cleaning	1.28
Maintenance/ Commercial Cleaning/ Sanitation	6.54
Medical/ Dental/ Optical Products and Services	0.52
Packaging and Mailing	1.37
Printing and Graphics	1.28
Publications	0.61
Home/Building Inspection Services	1.18
Real Estate Services	2.13
Recreation and Entertainment	1.08
Formal Wear and Tools Lease	0.60
Art, Art Supplies and Framing	0.70
Athletic Wear/ Sporting Goods	1.29
Clothing / Shoes / Accessories	0.31
Convenience Stores	0.84
Home Furnishing	1.87
Home Improvement and Hardware	0.51
Pet Product and Services	0.87
Photography Products and Services	0.65
Specialty Retail	4.02
Video/ Audio/ Electronics	0.48
Miscellaneous Retail	0.72
Security and Safety Systems	0.44
Signs	0.74
Travel	0.69
Miscellaneous	2.99
Total	**100**

Web Appendix B: Schwartz Bayesian Information Criterion for identifying the optimal lag length

Lag Length	SIC
0	20.9787
1	18.9807
2	19.6226
3	19.6797
4	19.2802
5	**18.6057***
6	18.6508
7	19.0520

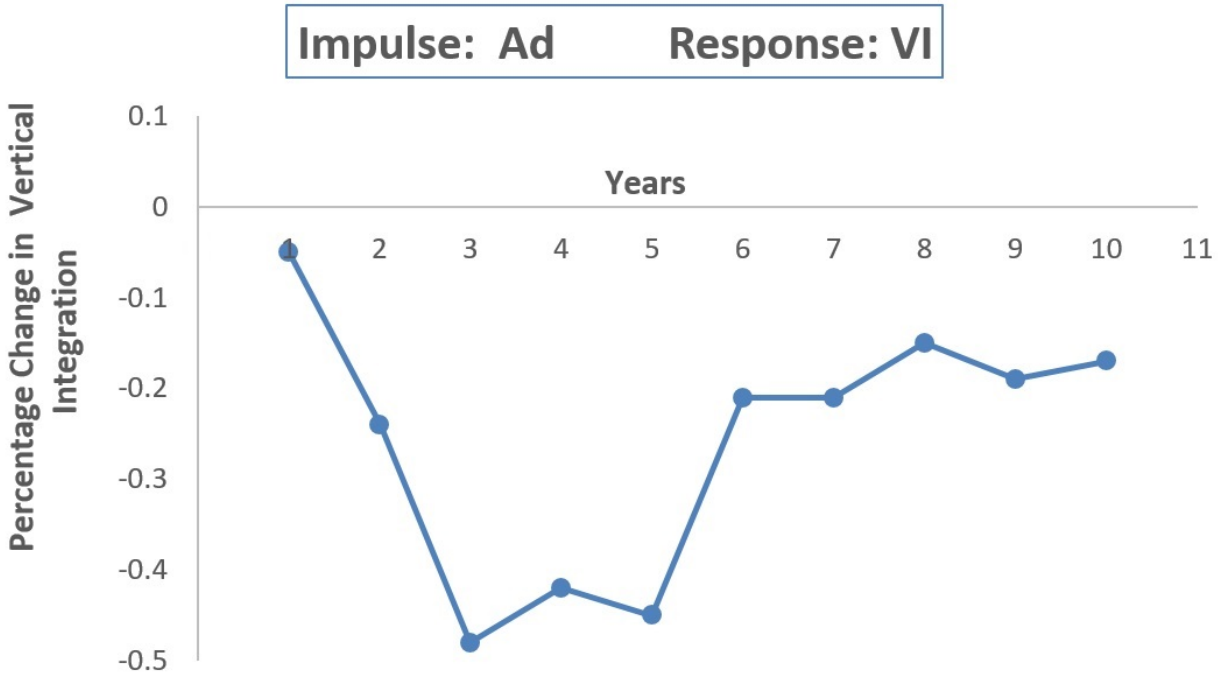
** Optimal lag length*

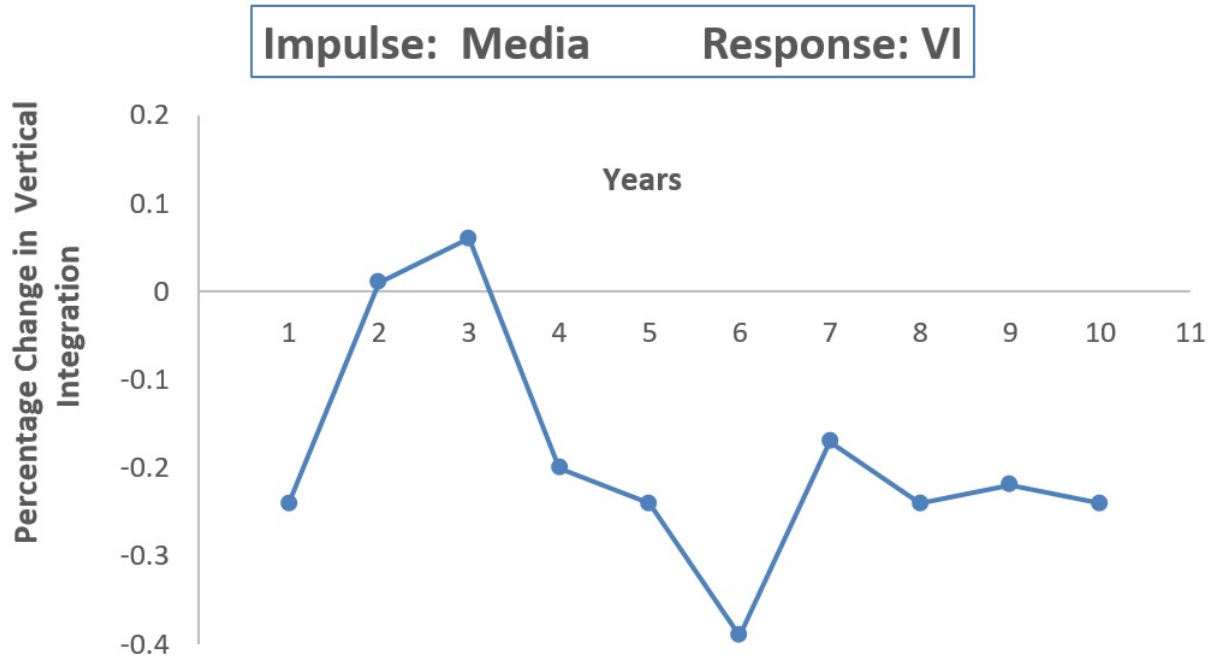
Web Appendix C: Bayesian PVARX Estimates

Bayesian VAR Estimates
Prior type: Normal-Wishart
Hyper-parameters: Mu: 0, L1: 0.1
Standard errors in ( ) & t-statistics in [ ]

	D(AD)	D(RRANK)	VI
D(AD(-1))	-0.108717	35.44613	-0.889088
	(0.07937)	(15.6809)	(1.18982)
	[-1.36972]	[2.26046]	[-0.74724]
D(AD(-2))	-0.216550	-19.54243	-1.606702
	(0.00038)	(0.07410)	(0.00562)
	[-577.377]	[-263.737]	[-285.771]
D(AD(-3))	-0.022235	2.026683	-0.483890
	(0.00571)	(1.12900)	(0.08567)
	[-3.89092]	[1.79511]	[-5.64862]
D(AD(-4))	-0.011394	1.006681	-0.515625
	(0.07731)	(15.2743)	(1.15897)
	[-0.14738]	[0.06591]	[-0.44490]
D(AD(-5))	-0.372106	-5.972238	0.967064
	(0.00036)	(0.07080)	(0.00537)
	[-1038.33]	[-84.3527]	[180.014]
D(RRANK(-1))	0.000131	-0.659262	0.003910
	(0.00717)	(1.41639)	(0.10747)
	[0.01825]	[-0.46545]	[0.03638]
D(RRANK(-2))	0.000168	-0.240293	0.003778
	(0.03828)	(7.56311)	(0.57387)
	[0.00438]	[-0.03177]	[0.00658]
D(RRANK(-3))	0.000296	-0.165657	-0.001756
	(0.00034)	(0.06688)	(0.00507)
	[0.87471]	[-2.47689]	[-0.34601]
D(RRANK(-4))	0.000118	0.038411	-0.003184
	(0.00529)	(1.04531)	(0.07932)
	[0.02224]	[0.03675]	[-0.04014]
D(RRANK(-5))	0.000214	0.007631	-0.005856
	(0.03951)	(7.80485)	(0.59221)
	[0.00542]	[0.00098]	[-0.00989]
VI(-1)	-0.001747	-0.769346	0.766643
	(0.00030)	(0.05946)	(0.00451)
	[-5.80363]	[-12.9380]	[169.914]
VI(-2)	0.001121	1.805734	0.016450
	(0.00424)	(0.83684)	(0.06350)
	[0.26476]	[2.15781]	[0.25907]
VI(-3)	0.001132	-1.492348	0.213528
	(0.06680)	(13.1967)	(1.00133)
	[0.01695]	[-0.11308]	[0.21324]
VI(-4)	-0.003517	0.596823	-0.043939
	(0.00030)	(0.05946)	(0.00451)
	[-11.6860]	[10.0379]	[-9.73944]
VI(-5)	0.002326	-0.448000	0.025415
	(0.00352)	(0.69566)	(0.05278)
	[0.66051]	[-0.64400]	[0.48148]
C	0.021415	18.91092	-1.599616
	(0.10647)	(21.0345)	(1.59604)
	[0.20114]	[0.89904]	[-1.00224]
AGE	-0.002273	0.674656	-0.098168
	(0.00257)	(0.50777)	(0.03853)
	[-0.88429]	[1.32865]	[-2.54794]
BDT	0.000147	-0.041162	-0.004785
	(0.00146)	(0.28881)	(0.02191)
	[0.10076]	[-0.14253]	[-0.21837]
FINANCING	0.061601	13.03927	0.796898
	(0.04943)	(9.76501)	(0.74094)
	[1.24631]	[1.33530]	[1.07552]
INDUSTRY	-0.002164	-1.099146	0.012151
	(0.00272)	(0.53667)	(0.04072)
	[-0.79649]	[-2.04808]	[0.29839]
INTERNATIONAL	0.008473	-0.029959	-0.442137
	(0.04448)	(8.78812)	(0.66682)
	[0.19048]	[-0.00341]	[-0.66306]
LNSIZE	0.007620	-2.634403	0.502213
	(0.01844)	(3.64351)	(0.27646)
	[0.41317]	[-0.72304]	[1.81659]
R-squared	0.290079	0.384276	0.956552
Adj. R-squared	0.180459	0.289201	0.949844
Sum sq. resids	6.538684	333844.4	1920.432
S.E. equation	0.219268	49.54532	3.757769
F-statistic	2.646224	4.041822	142.5814
Mean dependent	0.015823	-0.829114	11.53677
S.D. dependent	0.242209	58.76643	16.77903

Web Appendix D: Impulse Response Functions for the Effect of an Orthogonalized Shock in Brand Equity on Vertical Integration



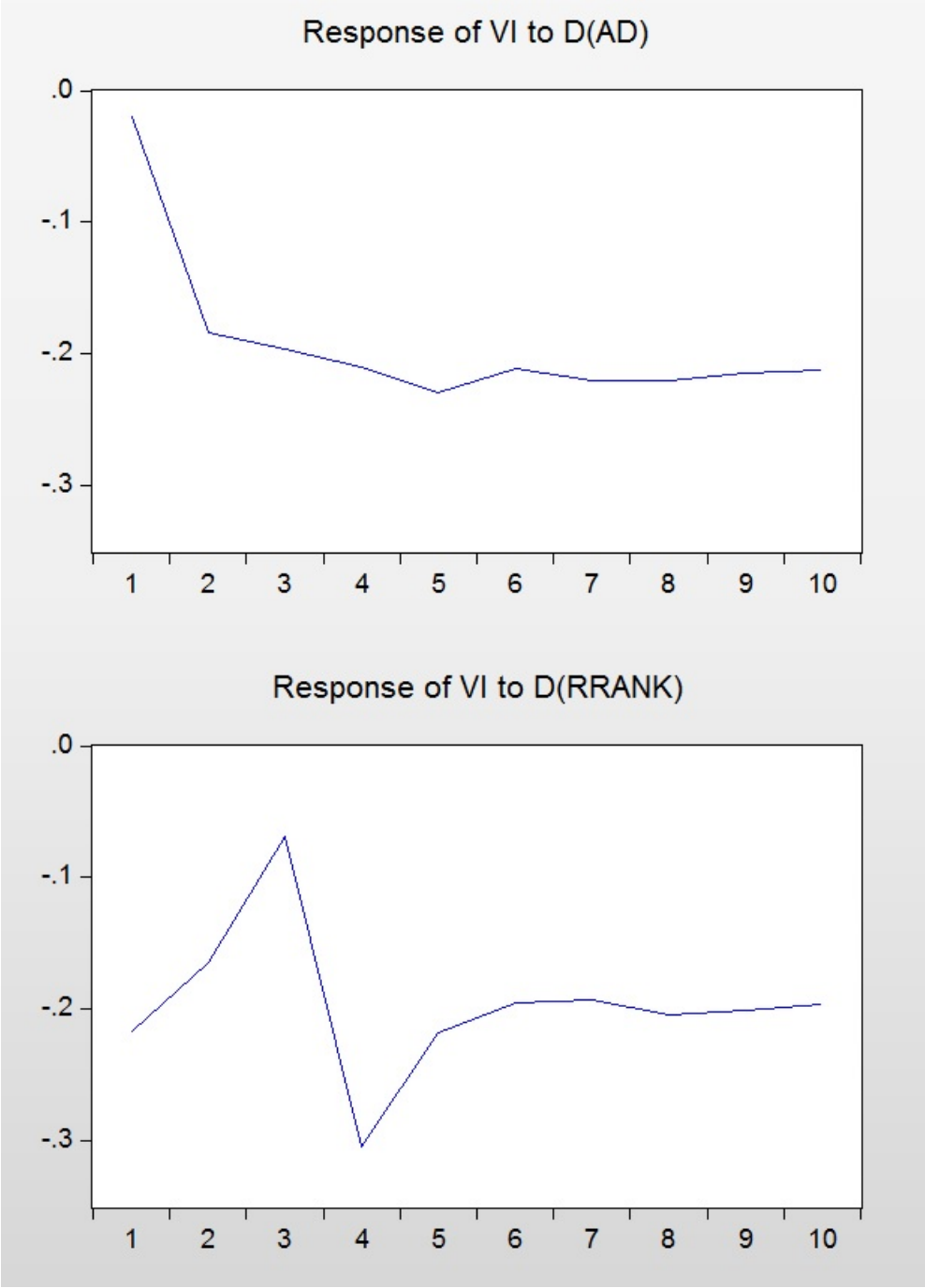


Web Appendix E: Variance Decomposition Analysis of VI

Period	S.E.	D(AD)	D(RRANK)	VI
1	0.203431	0.020042	0.416612	99.56335
2	0.204819	0.265674	0.262418	99.47191
3	0.208789	1.060835	0.223225	98.71594
4	0.209047	1.364397	0.288493	98.34711
5	0.209547	1.647019	0.385652	97.96733
6	0.223538	1.532790	0.656343	97.81087
7	0.224441	1.443770	0.635976	97.92025
8	0.226123	1.346835	0.676445	97.97672
9	0.226272	1.285751	0.696441	98.01781
10	0.226519	1.229491	0.728200	98.04231

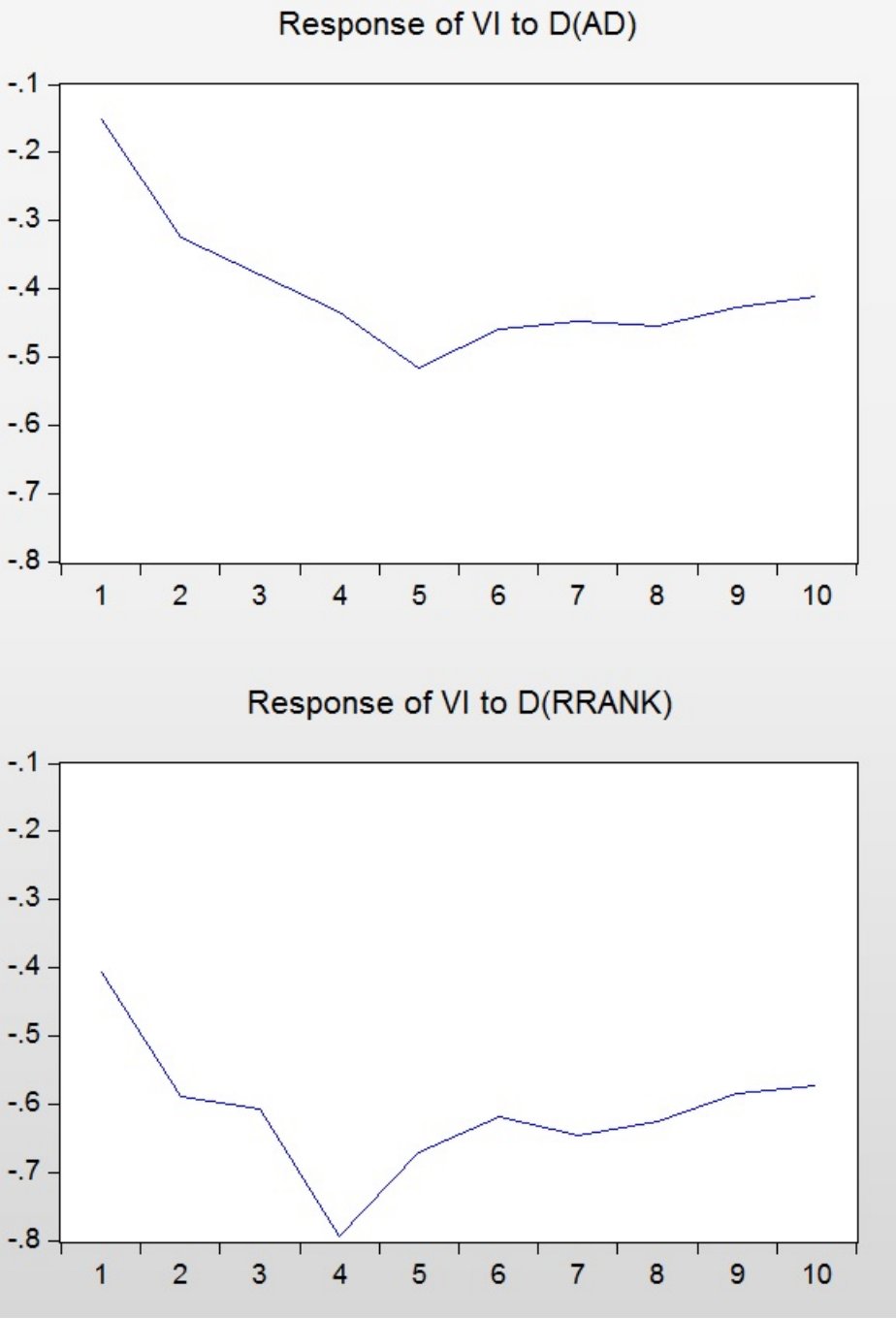
Web Appendix F: Generalized IRFs for the BPVARX with Lag Length L=3

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



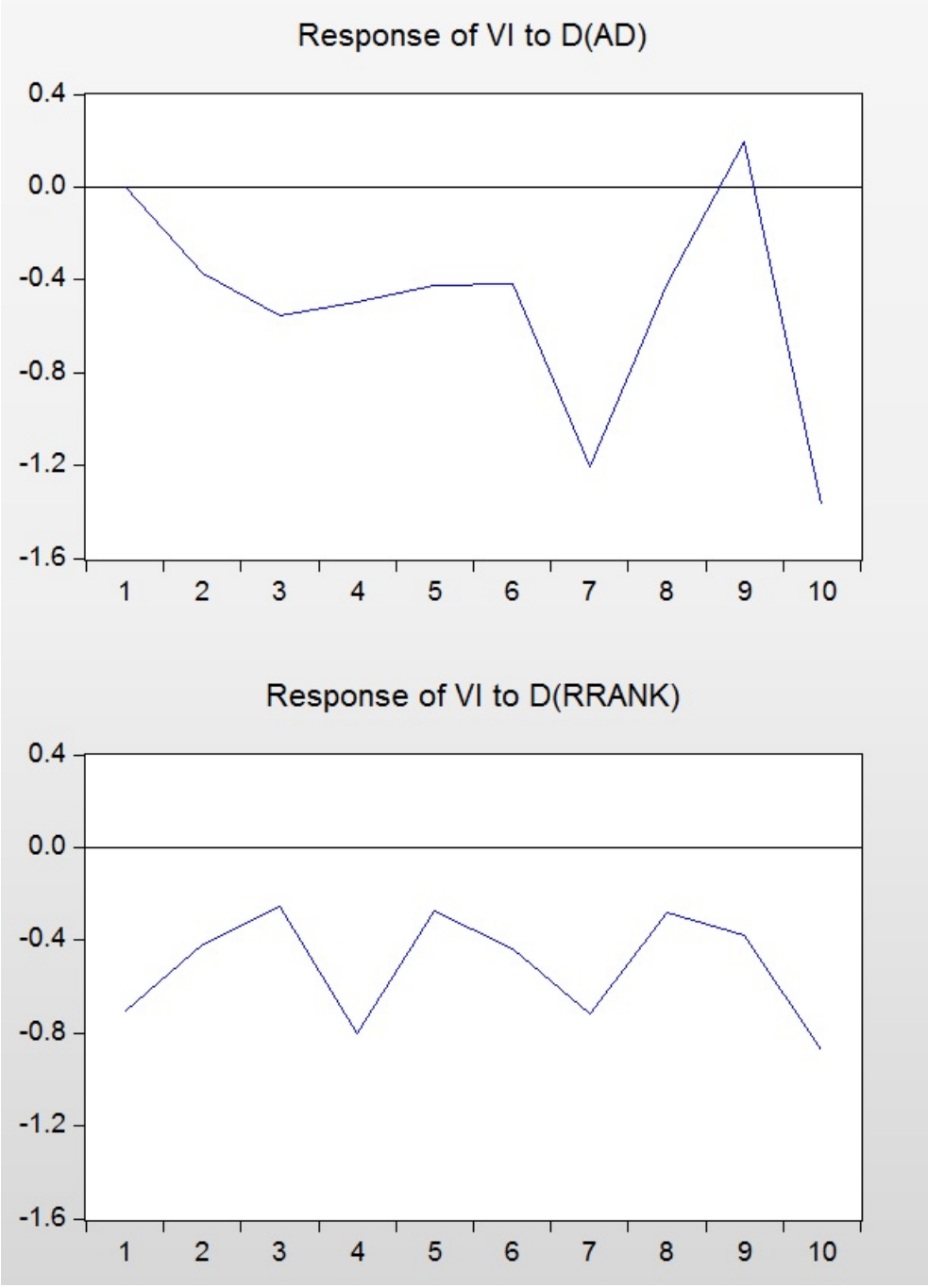
Web Appendix G: Generalized IRFs for the BPVARX with Lag Length L=4

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



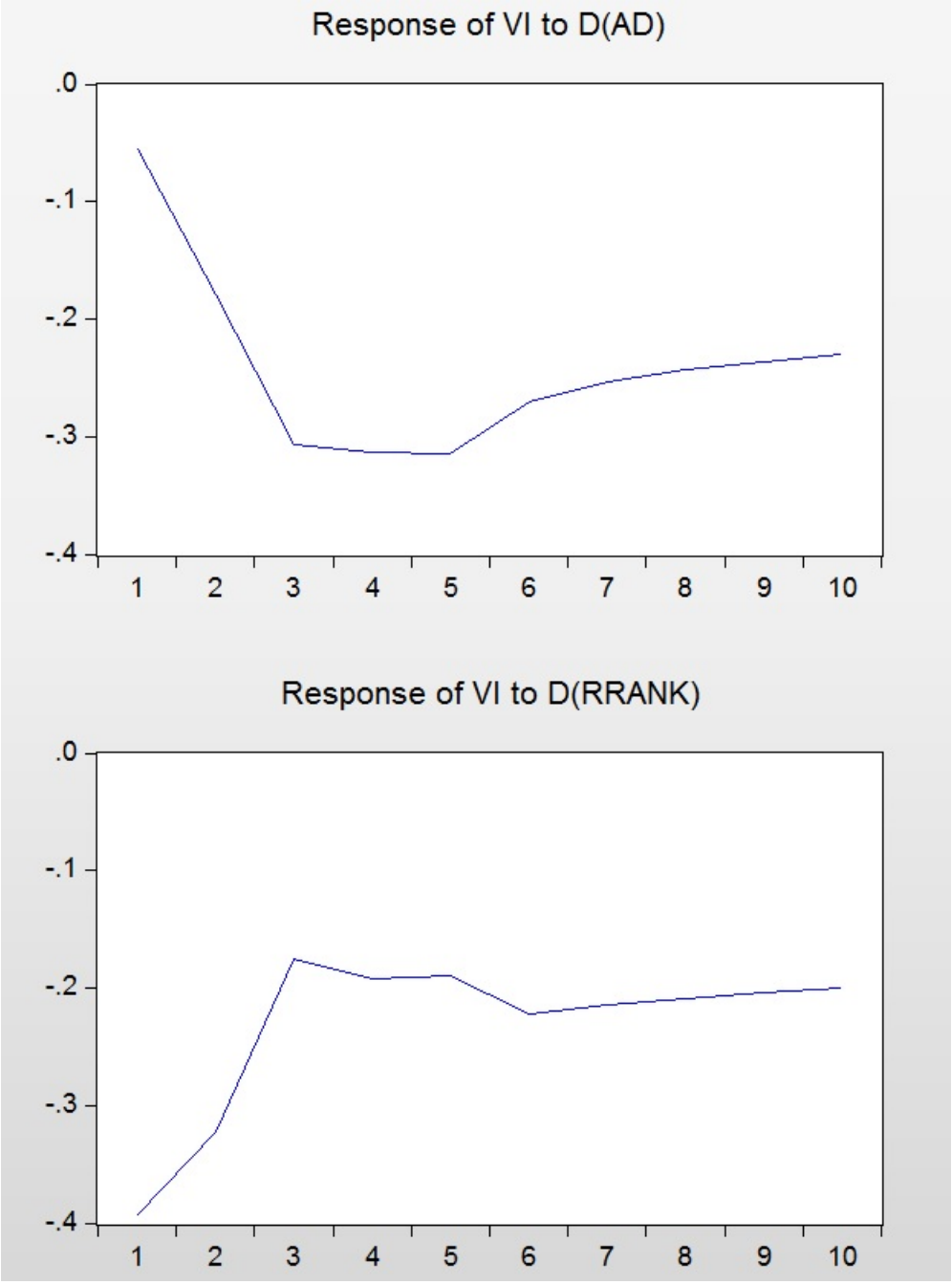
Web Appendix H: Generalized IRFs for the BPVARX with Lag Length L=6

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



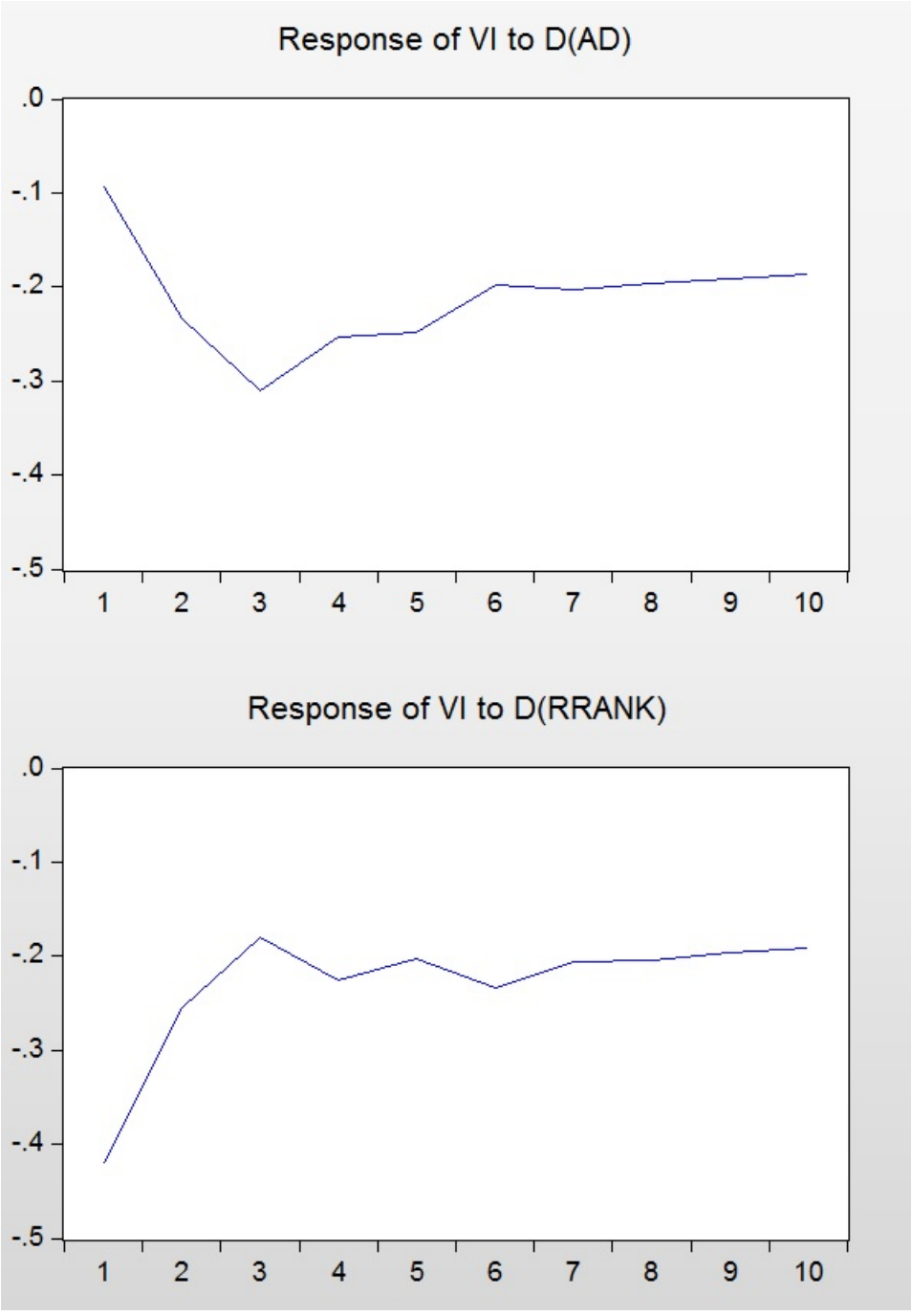
Web Appendix I: Generalized IRFs for the BPVAR (no control variables) –Wishart Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



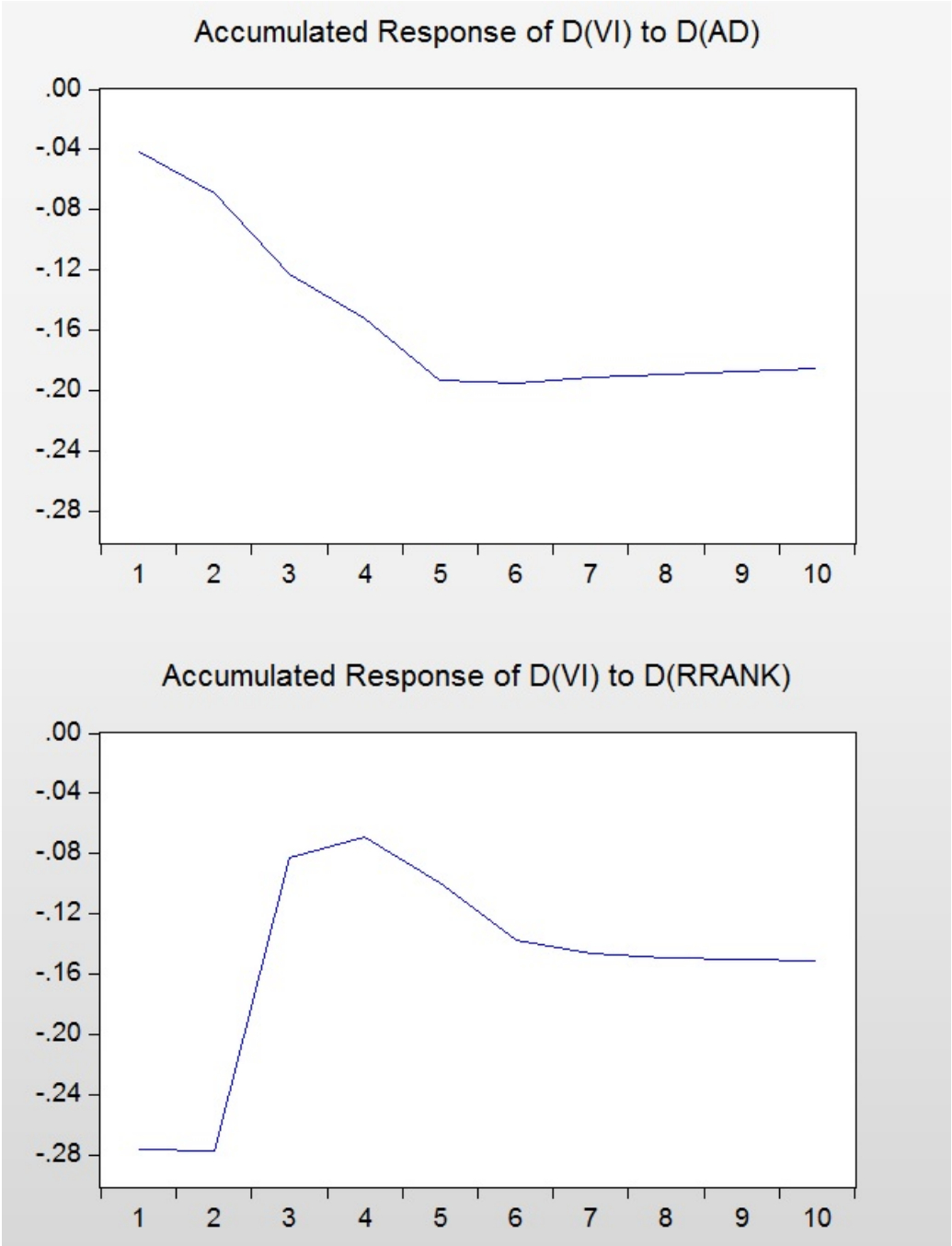
Web Appendix J: Generalized IRFs for the BPVAR (no control variables) – Minnesota Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



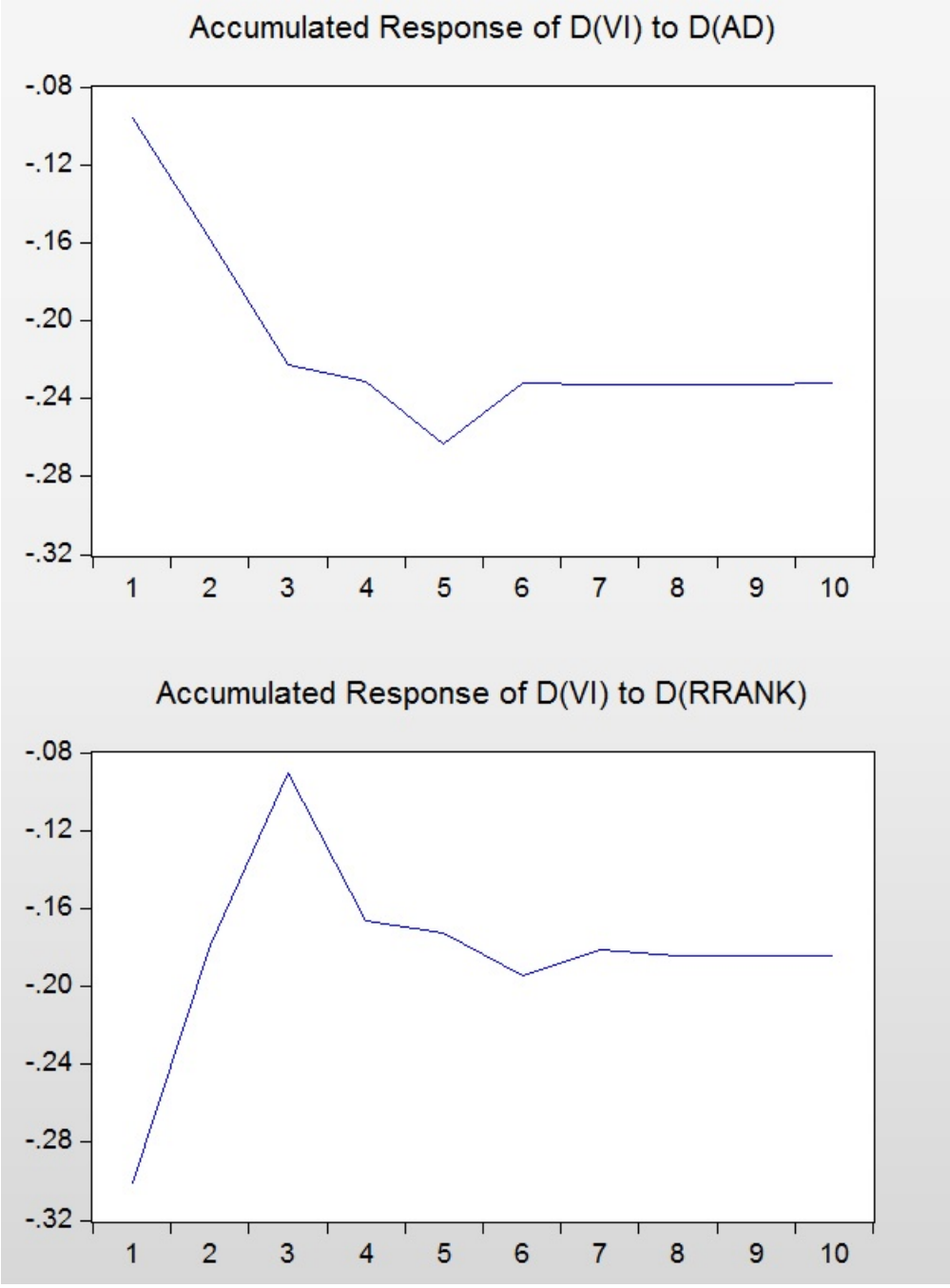
Web Appendix K: Accumulated GIRFs for an All-In-First-Difference BPVARX model – Wishart Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



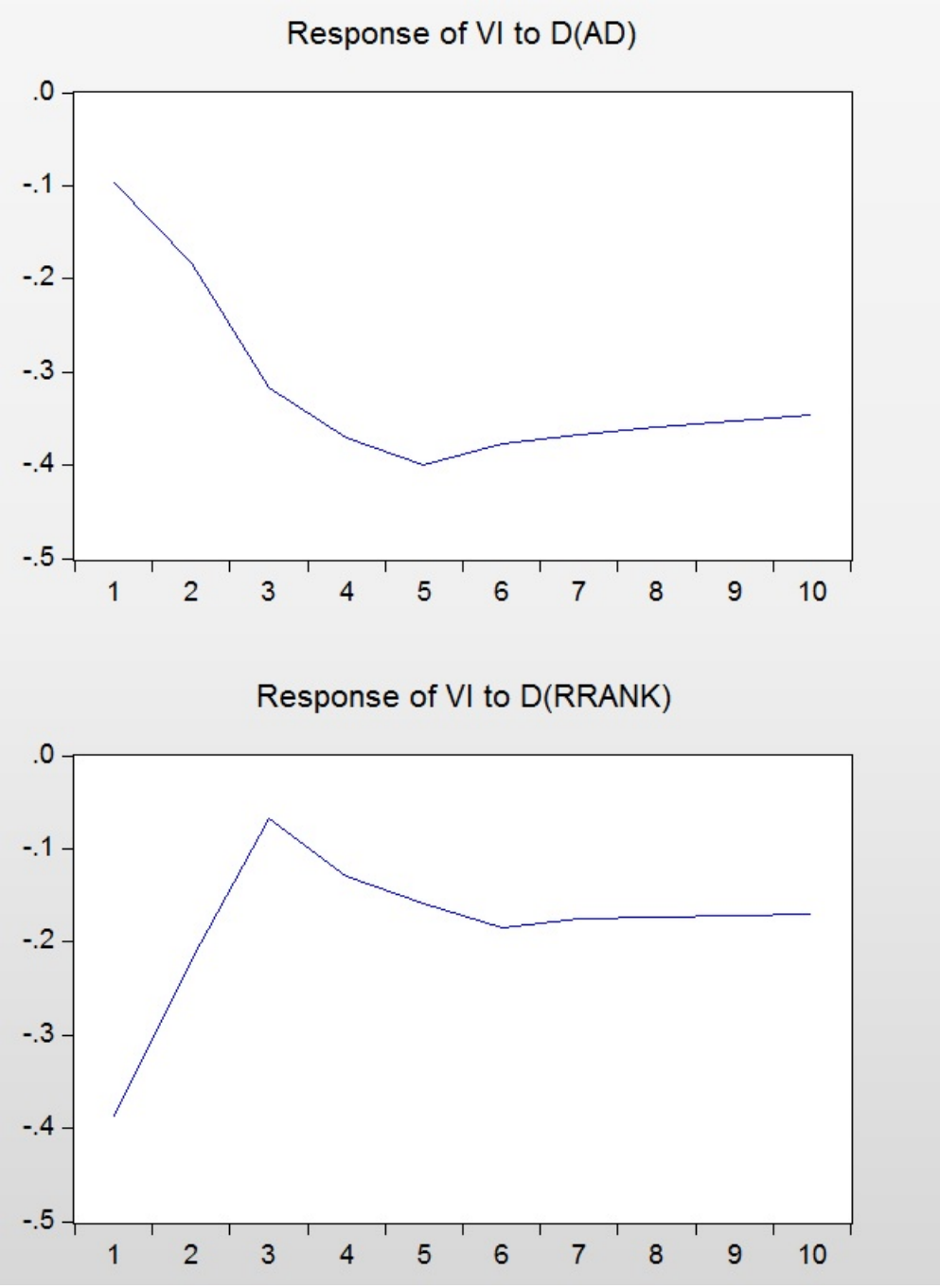
Web Appendix L: Accumulated IRFs for an All-In-First-Difference BPVARX model – Minnesota Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



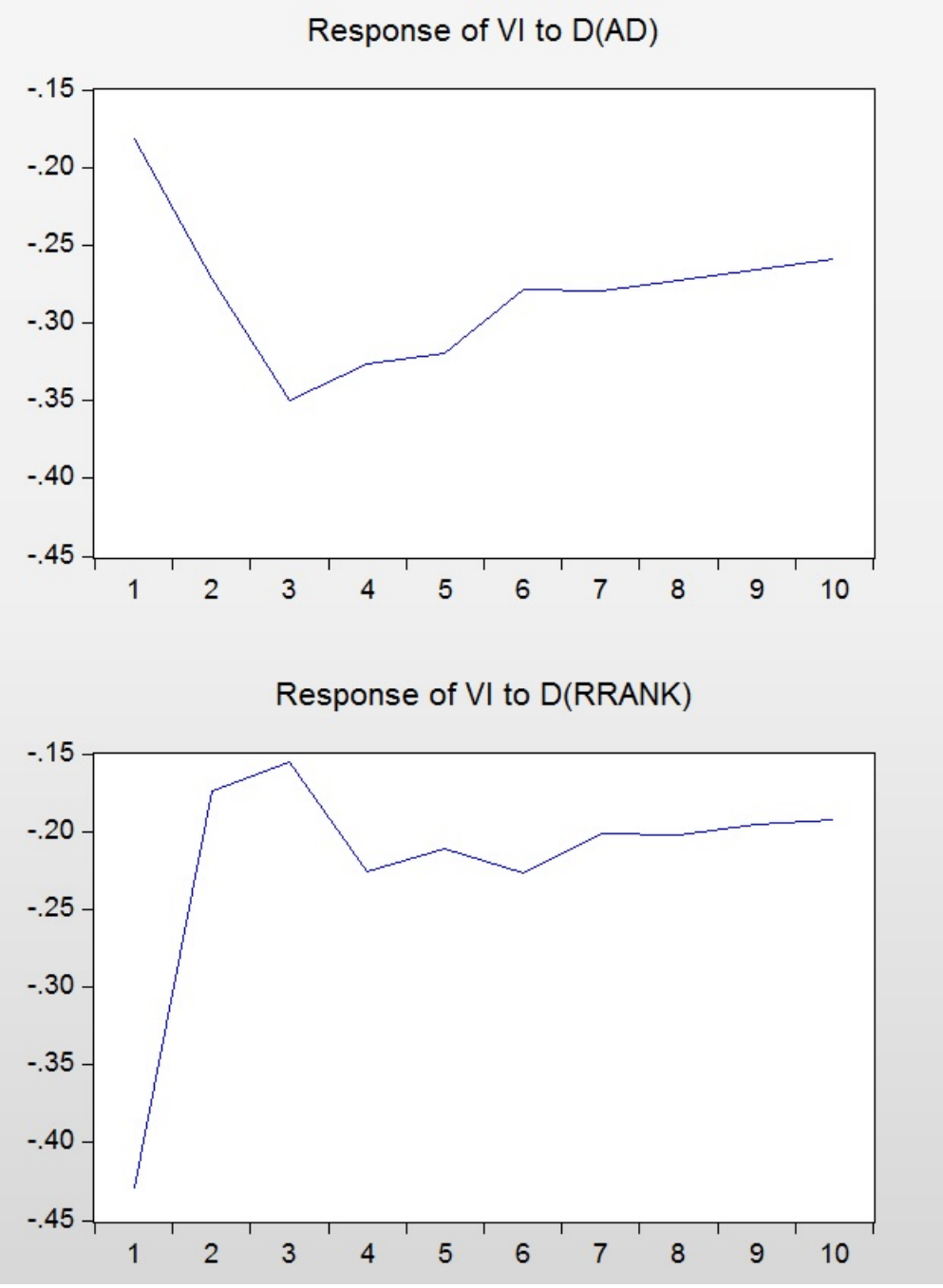
Web Appendix M: Generalized IRFs for a BPVARX over the balanced sub-panel only – Wishart Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



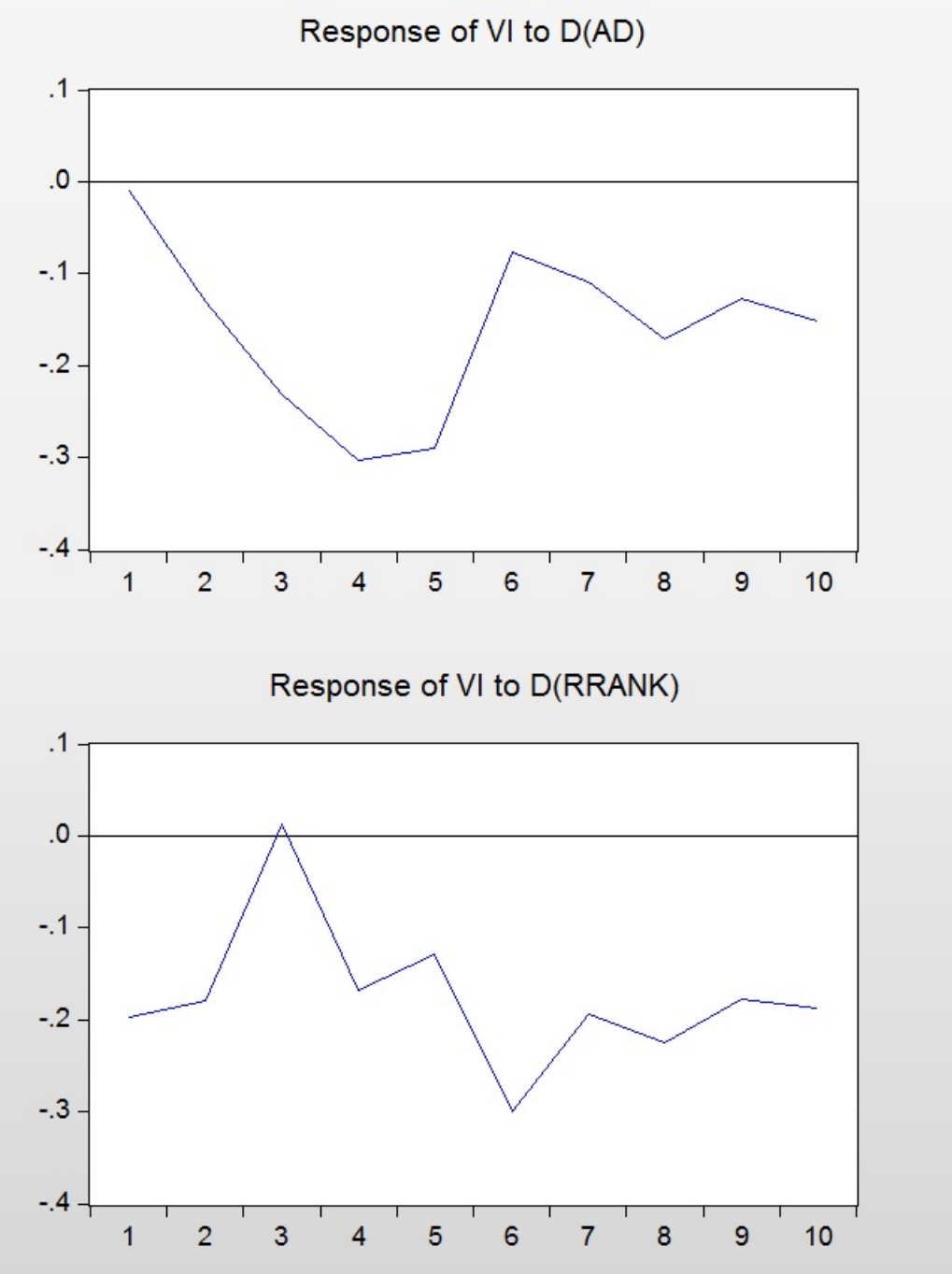
Web Appendix N: Generalized IRFs for a BPVARX over the balanced sub-panel only – Minnesota Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



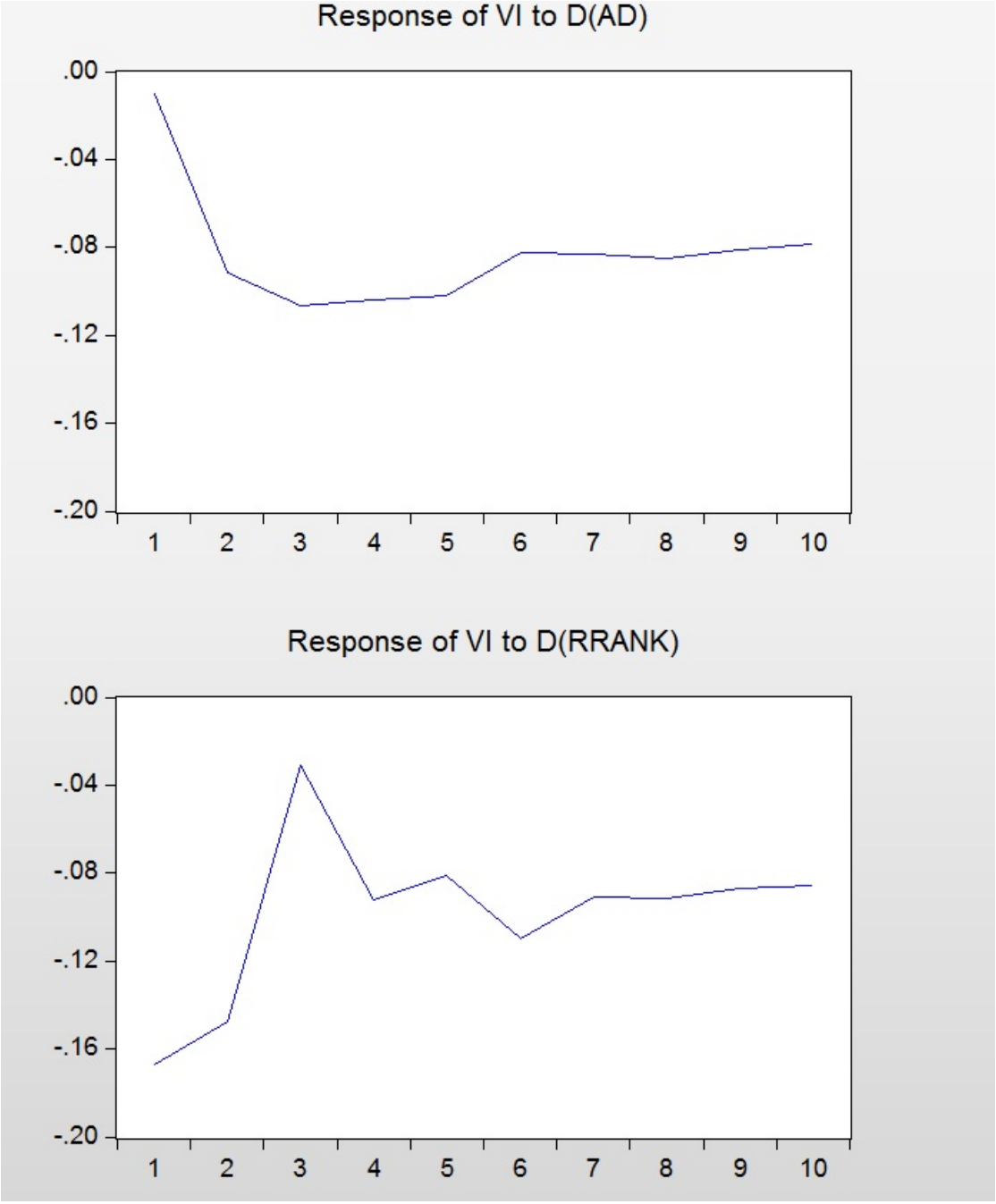
Web Appendix O: Generalized IRFs for a BPVARX over the Full Sample (including observations with missing/censored-at-zero dependent variable) - Wishart Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



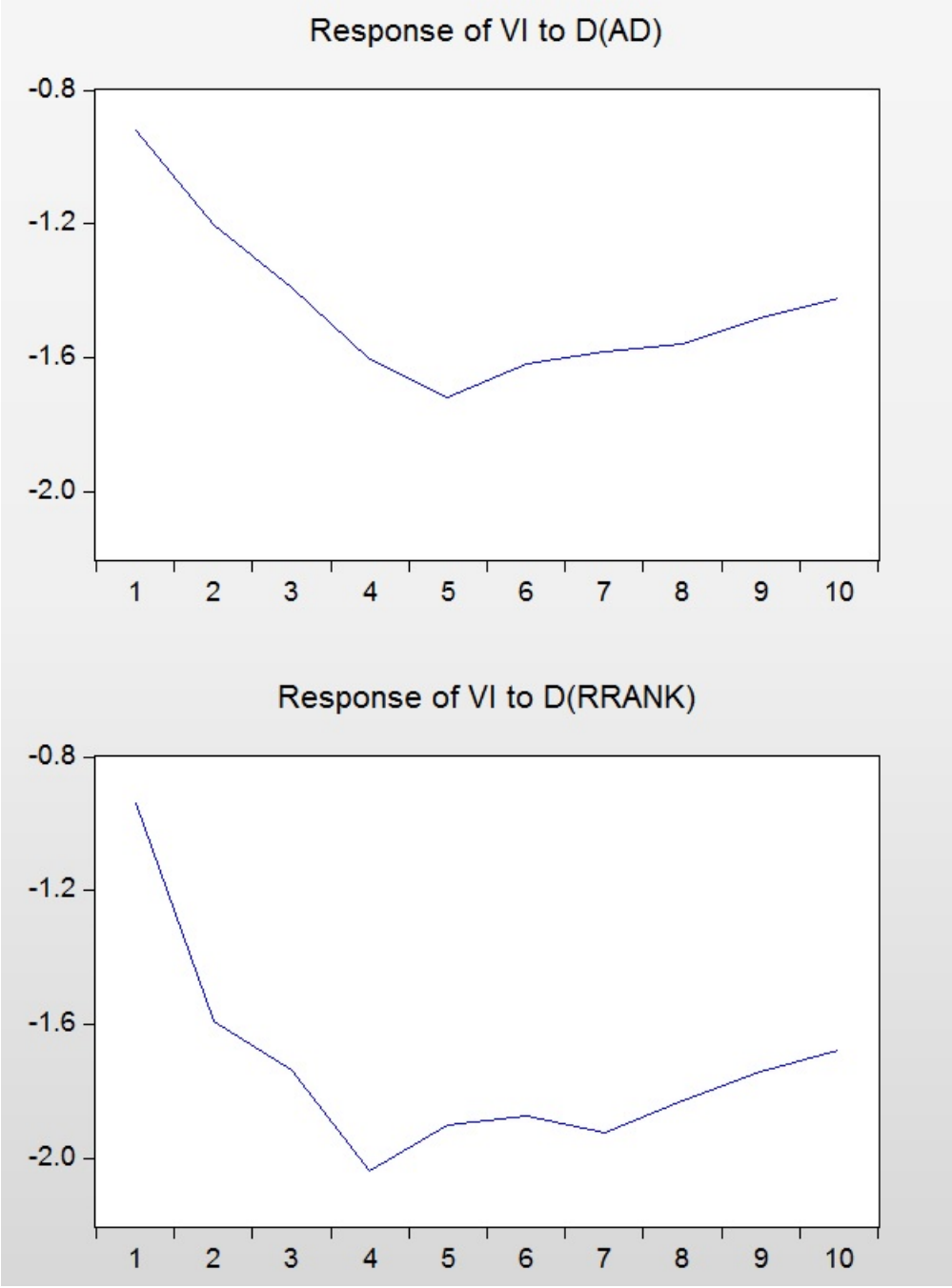
Web Appendix P: Generalized IRFs for a BPVARX over the Full Sample (including observations with missing/censored-at-zero dependent variable) - Minnesota Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



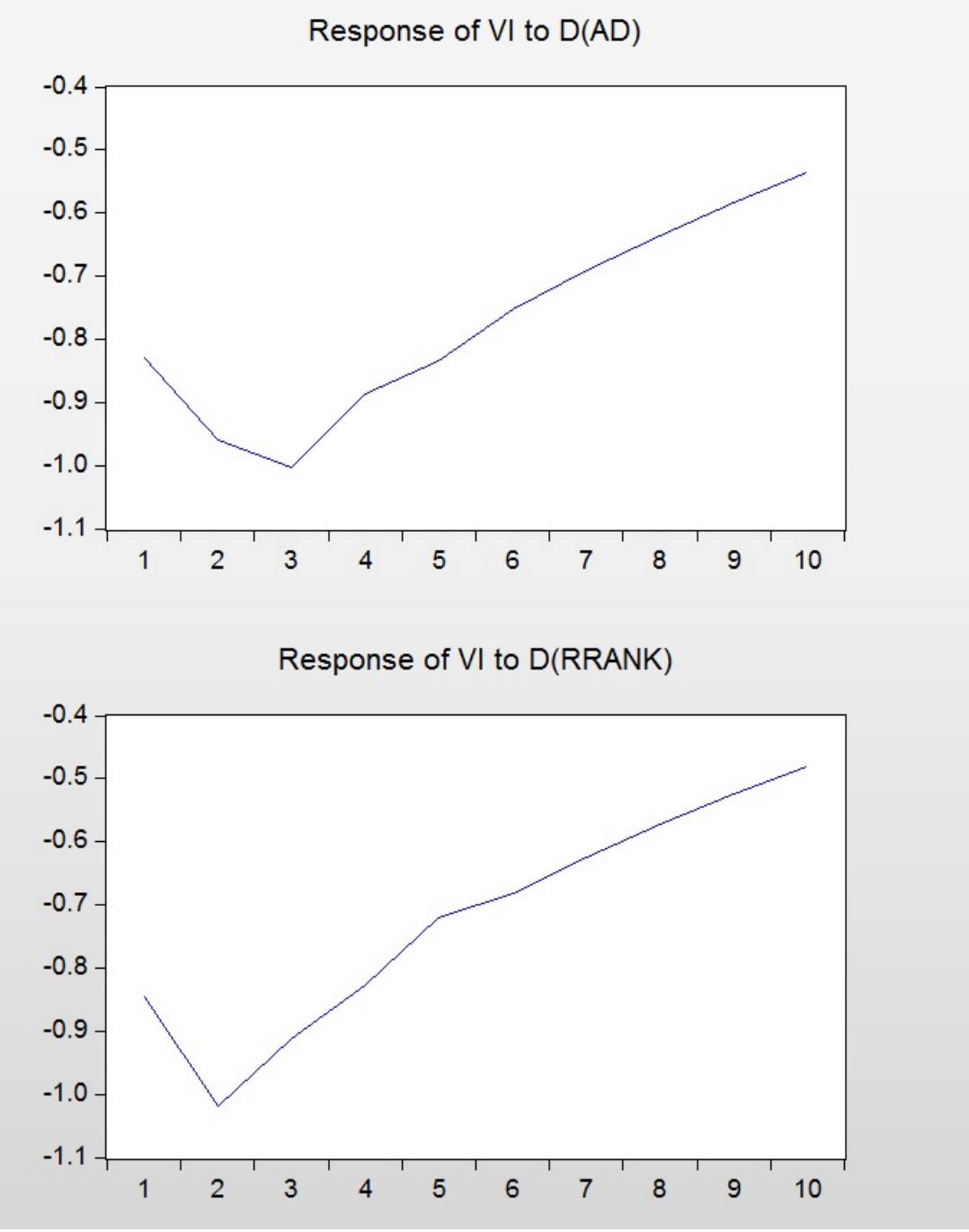
Web Appendix Q: Generalized IRFs for the BPVARX model on Trimmed Subsample (excluding +/- 5 Percentile) – Wishart Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



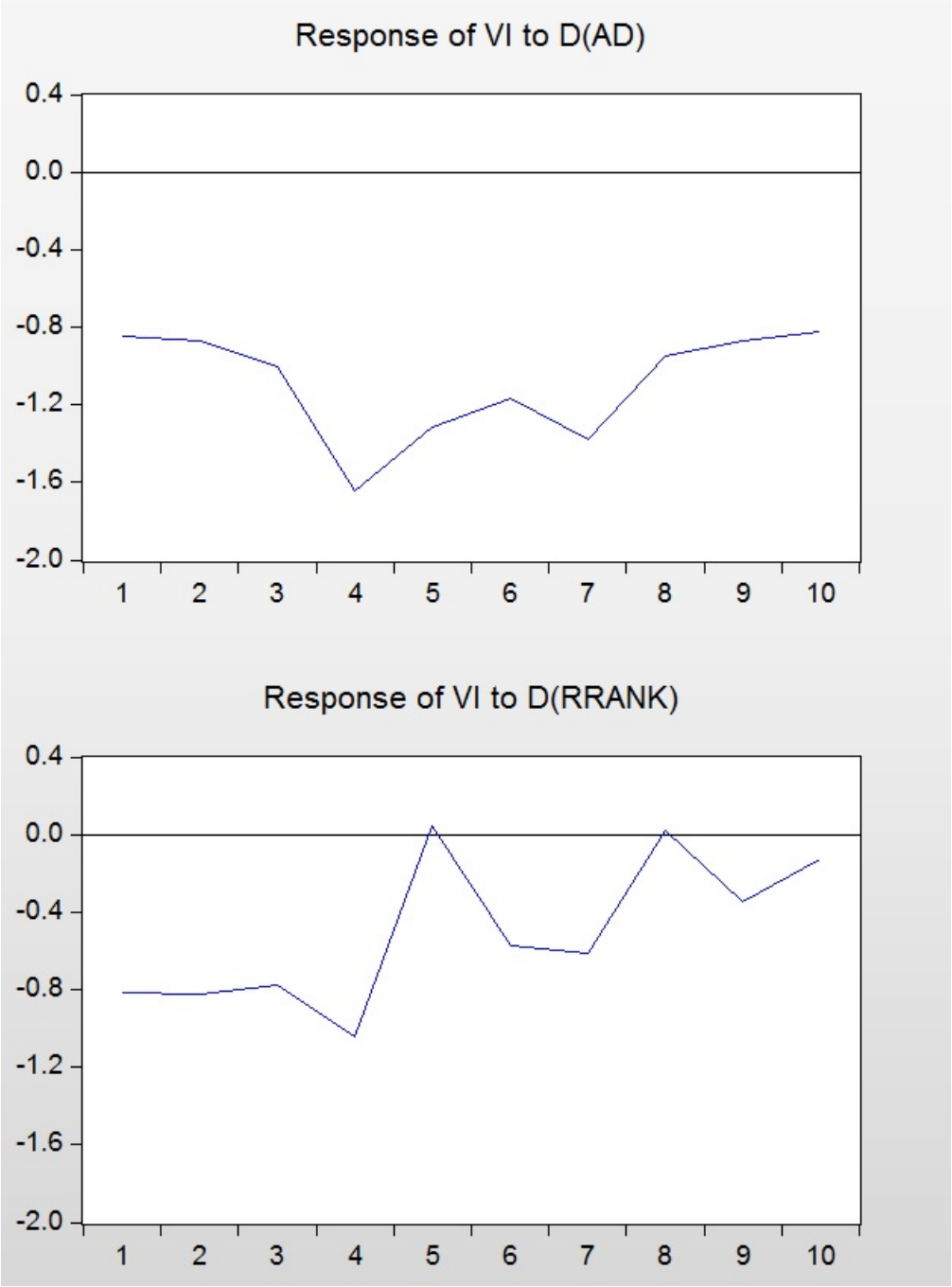
Web Appendix R: Generalized IRFs for the BPVARX model on Trimmed Subsample (excluding +/- 5 Percentile) – Minnesota Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



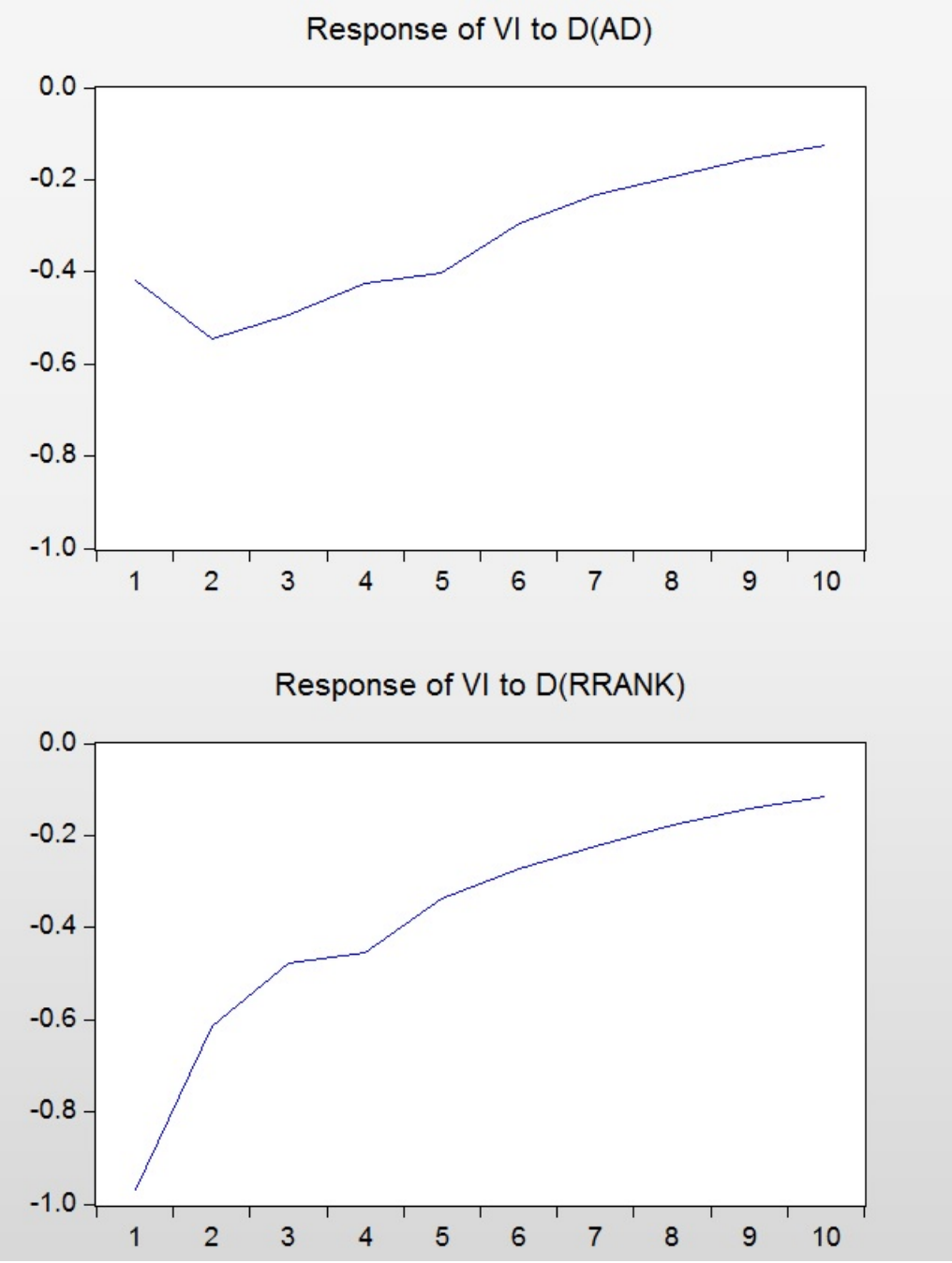
Web Appendix S: Generalized IRFs for the BPVARX model on Trimmed Subsample (excluding +/- 10 Percentile) – Wishart Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



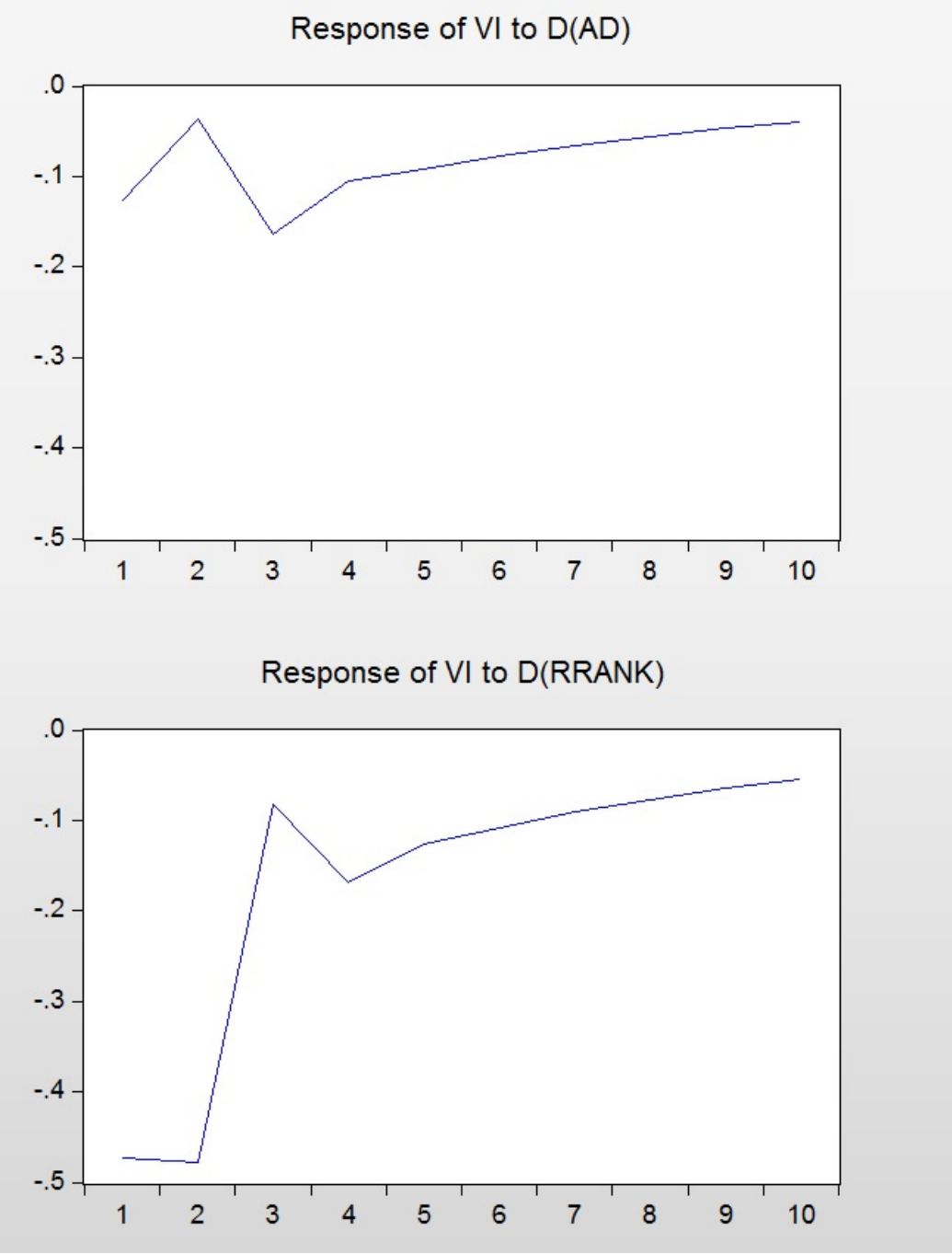
Web Appendix T: Generalized IRFs for the BPVARX model on Trimmed Subsample (excluding +/- 10 Percentile) – Minnesota Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



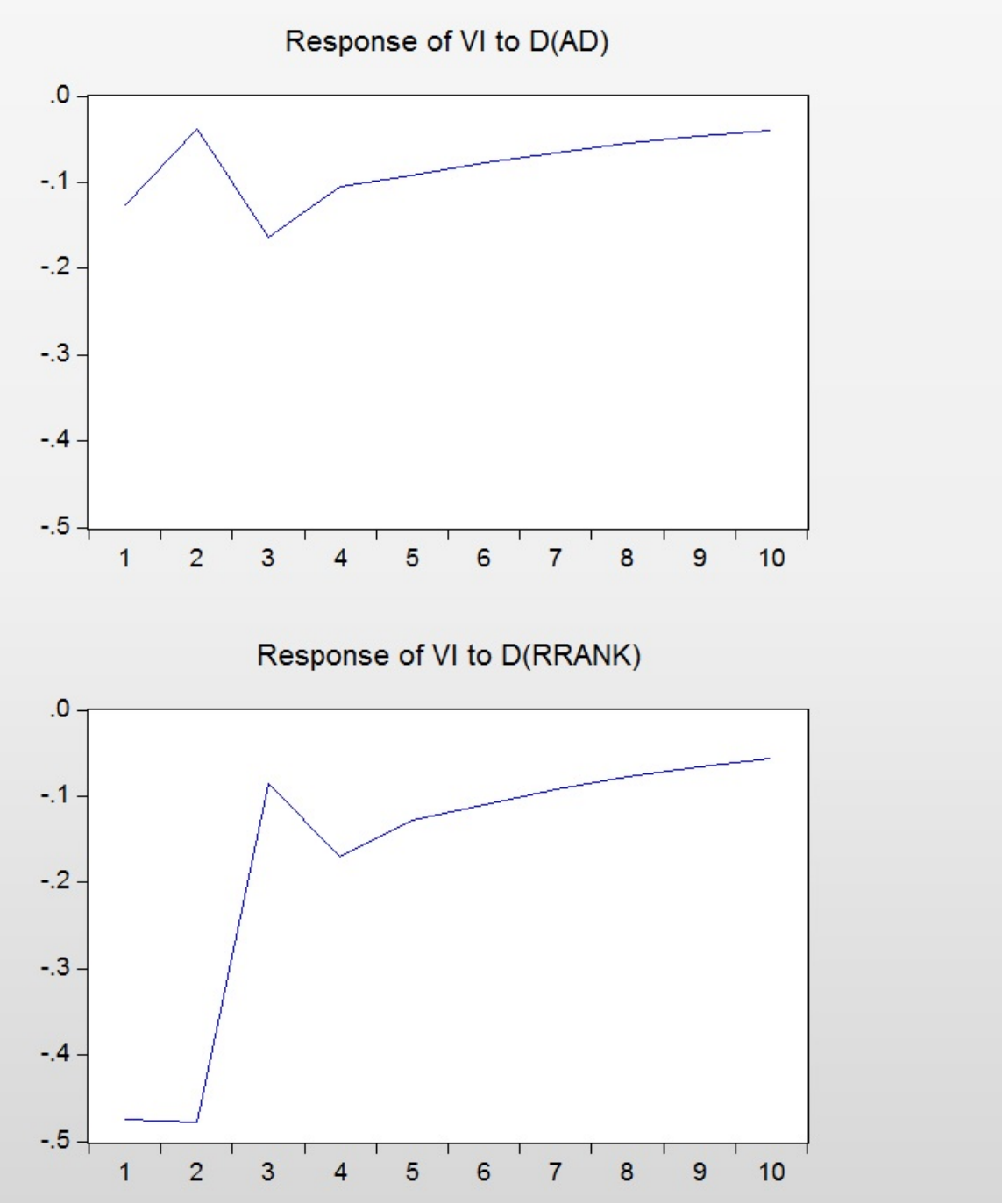
Web Appendix U: Generalized IRFs for the BPVARX model on Trimmed Subsample (excluding +/- 15 Percentile) – Wishart Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



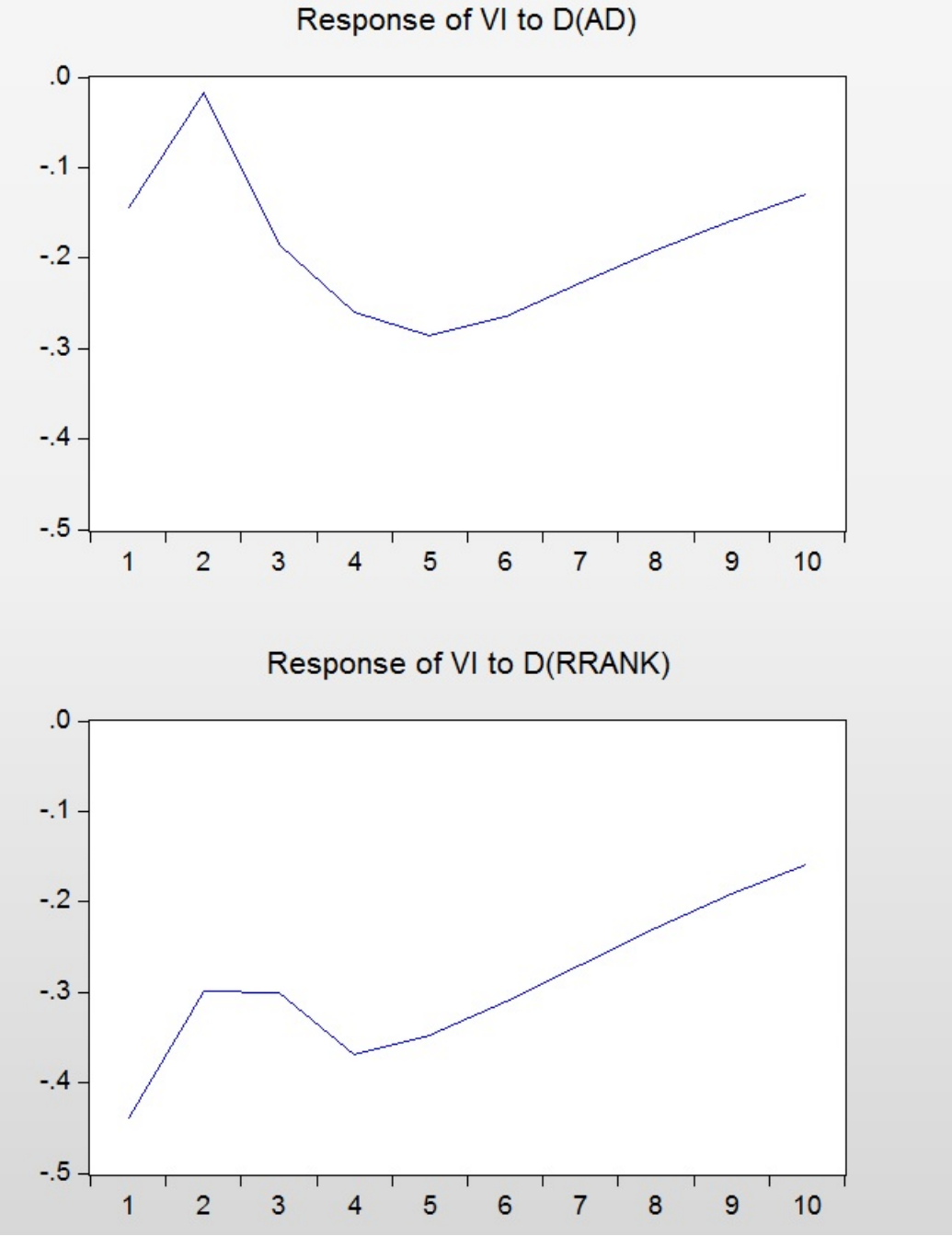
Web Appendix V: Generalized IRFs for the BPVARX model on Trimmed Subsample (excluding +/- 15 Percentile) – Minnesota Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



Web Appendix W: Generalized IRFs for the BPVARX model on Trimmed Subsample (excluding +/- 20 Percentile) – Wishart Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)



Web Appendix X: Generalized IRFs for the BPVARX model on Trimmed Subsample (excluding +/- 20 Percentile) – Minnesota Prior

(Horizontal Axis: Time in Years; Vertical Axis: Percentage Change in Vertical Integration)