

**LEVERAGING SYNERGIES VERSUS RESOURCE REDEPLOYMENT: SALES  
GROWTH AND VARIANCE IN PRODUCT PORTFOLIOS OF DIVERSIFIED FIRMS**

**Marco S. Giarratana**

IE University

marco.giarratana@ie.edu

Calle Maria de Molina 31, 28006 Madrid (Spain)

<https://orcid.org/0000-0002-0015-6529>

**Martina Pasquini\***

IE University

martina.pasquini@ie.edu

Calle Alvarez de Baena 4, 28006 Madrid (Spain)

<https://orcid.org/0000-0002-4917-8470>

**Juan Santaló**

IE University

[juan.santalo@ie.edu](mailto:juan.santalo@ie.edu)

Calle Alvarez de Baena 4, 28006 Madrid (Spain)

<https://orcid.org/0000-0002-0339-3343>

\*corresponding author

Running ahead: Sales growth and variance in product portfolios of diversified firms

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process which may lead to differences between this version and the [Version of Record](#). Please cite this article as doi: [10.1002/smj.3281](https://doi.org/10.1002/smj.3281)

Keywords: Resources, Diversification, Redeployment, Synergies, Performance-Variance

## ABSTRACT

**Research summary.** This article analyzes the relationship between sales growth and variance for diversified firms. Distinguishing product niches linked by scale free versus non-scale free resources, this study predicts that the more a firm diversifies leveraging on a non-scale free resource, the more likely its sales growth and variance are positively correlated. However, this relationship is negatively moderated by the presence of a scale-free resource such that the presence of scale-free resources of high value implies a negative correlation. These theoretical intuitions are consistent with data from 2008–2013, reflecting firm sales growth rates in five industries spanning 45 product niches in seven EU countries and the United Kingdom. These industries prioritize shelf space as a non-scale free resource, and brand as a scale free resource.

**Managerial summary.** Diversifiers may base their value creation either in pursuing synergies or in exploiting the benefits derived by internal resource redeployment across products or across industries. Here we highlight the different managerial implications on risk/performance structure derived from diversification based on resource redeployment compared to diversified companies exploiting synergies. Can the disparity of sales growth between products of the same firm's portfolio be good for the corporate performance? Here, we show that diversification based on resource redeployment goes hand in hand with a positive relation between overall firm growth and variance of results within the same firm. On the contrary, firm diversification based on synergies implies a negative relationship between within firm disparity and overall firm growth.

## INTRODUCTION

The relationship between the performance of product portfolios, defined as all products or services offered by a firm, and its variance might depend on synergy and redeployment logics (Helfat & Eisenhardt, 2004; Wu, 2013), in the presence of scale free or non-scale free resources. Consider an example: In the summer of 2017, the CEO of Coca-Cola Jeff Quincey announced that customers would soon find a new diet drink on supermarket shelves, Sugar Free Coke without artificial sweeteners (*The Wall Street Journal*, 2017). With this strategic move, Coca-Cola responded to external dynamics that prompted decreasing demand for colas, as well as government policies that increased taxes on calorie-laden drinks (*The Wall Street Journal*, 2016). Sugar Free Coke joined scores of other products in Coca-Cola's beverage portfolio, including water, energy drinks, tea, juices, and other colas, which raised questions at the portfolio level. For example, would sales of Sugar Free Coke be good or bad news for the sales of Dasani (Coca-Cola's bottled water)? And what would happen to the business of regular Coke products? If sales of the distinct products in Coca-Cola's portfolio move in the same direction (i.e., little intrafirm variance), is that good or bad for Coca-Cola's overall portfolio performance?

Such questions might be informed by two distinct logics pertaining to value creation, namely, synergy and redeployment, which indicate the presence or absence of constrained resource capacity (Levinthal & Wu, 2010; Sakhartov & Folta, 2014). Under these premises, this article investigates the relationship between resource redeployment in a product portfolio, and firm sales growth rates (Henkel, 2009), by distinguishing the influences of non-scale free vs. scale free resources (Hashai, 2015; Helfat & Eisenhardt, 2004; Sakhartov & Folta, 2014, 2015; Wu, 2013). If a resource can increase value when put to use, regardless of how many times it gets used by other units across the product portfolio (e.g., general purpose technology; Feldman

& Yoon, 2012; Thoma, 2009), it is a scale free resource (Lieberman, Lee, & Folta, 2017; Sakhartov & Folta, 2014), and it leverages *synergies*. Any negative or positive shift in the value of this shared asset, such as might result from changes in the environment, should exert impacts in the same direction across all the product lines supported by this common resource (Diestre & Santaló, 2020; Shaver, 2006). If instead the use of a resource generates opportunity costs, as in the cases of managerial attention (Wu, 2013), distribution channels, or shelf space (Brahm, Tarzijan, & Singer, 2017), it is a non-scale free resource (Levinthal & Wu, 2010) with a *redployment* logic. Once dedicated to a product within the portfolio, this resource cannot be fully employed at the same time for another product.

By applying such a classification to firm resources, we can anticipate different diversification processes too. If a firm diversifies by leveraging the synergetic relations across its product portfolio, sales of the distinct firm product niches are more likely to move in parallel, in the same direction. If instead it does so by adopting a redeployment logic, the firm's products have to compete for non-scale free resources, such that some products in the portfolio gain success at the expense of others, and performance across the distinct lines does not have a consistent direction. We then go a step further, to predict that the two logics have separate implications for performance variance. If a firm diversifies with a strategy based on scale free assets, any variance in product sales growth across the portfolio may be detrimental to the firm's overall growth. If instead it relies on non-scale free resources, varying performance across product lines could enhance its overall growth prospects. Consider the Coca-Cola example again. Asymmetric trends in sales of different Coca-Cola products might prompt or result from the efficient allocation of scarce shelf space, a non-scale free resource, to these distinct products. Intrafirm variance, such that Sugar Free Coke performs better than Dasani water, or vice versa,

therefore may be associated with greater overall Coca-Cola sales growth. However, if the products share the same Coca-Cola branding, which is a scale free resource, intrafirm variance might be problematic. The spillover effects of the Coca-Cola brand on both Sugar Free Coke and traditional Coke might be compromised if one of them underperforms severely.

Accordingly, we predict different relationships between portfolio variance and overall firm growth rates, depending on the type of resources that a firm uses. We further elaborate on a novel link between within-firm variability and a firm's growth rate. Building on recent developments in diversification research (Barroso & Giarratana, 2013; Hashai, 2015; Zahavi & Lavie, 2013), our approach complements a traditional perspective on diversification (Rumelt, 1982; Teece, 1982), according to which firms' resources create added value across different markets and submarket niches, as long as the economies of scope exceed any internal coordination costs (Brahm et al., 2017; Hashai, 2015; Zhou, 2011). We also test our predictions in an empirical analysis that uses six years of sales data from five shelf-space-dominated industries, which comprise 45 product niches in eight different countries. The allocation of shelf space is a non-scale free resource; using the same brand across product categories is a scale free resource. The empirical results, which are robust to the firm and time fixed effects that we include to address endogeneity concerns, indicate that firms achieve growth in accordance with the resource redeployment logic, and portfolio variance is positively associated with firm sales growth. Scale free resource diversification instead generates growth through synergies, so it negatively moderates the relationship between portfolio variance and firm sales growth.

These findings advance extant redeployment research, which acknowledges that firms can grow by exploiting variability in their external environmental opportunities (Helfat & Eisenhardt, 2004; Kogut & Kulatilaka, 1994; Sakhartov & Folta, 2014; Triantis & Hodder, 1990)

Accepted Article

but tends to overlook the impact of redeployment on within-firm variability. We argue and show empirically that greater internal variance (cf. sectorial variance) signals the firm is using resource redeployment to grow—as long as its diversification strategy is based on a resource redeployment logic. This logic does not hold if the firm relies on scale free assets. Performance variance thus can be negative or positive for a diversified firm’s overall performance, depending on which diversification approach it pursues. Finally, we offer a novel level of analysis; to the best of our knowledge, we offer the first empirical estimation of scale free and non-scale free resources at macro- (i.e., firm based) and micro- (i.e., within the firm’s portfolio) levels, using data across multiple industries.

The paper is organized as follows. The next section highlights the theory background, followed by the hypotheses’ development. The empirical section is divided between the portfolio analysis, and the firm-based analysis. We will then propose a section of additional empirical results, before the concluding section.

## **RELATED LITERATURE**

### **The evolution of diversification literature**

Early views on diversification strategies, rooted in agency cost theory (Jensen & Meckling, 1976), describe managers who increase their power by investing in growth strategies and diversification, rather than paying dividends to shareholders (Berger & Ofek, 1995; Denis, Denis, & Sarin, 1997). Consequently, scholars of corporate diversification, from a financial economics tradition, reported evidence of a so-called diversification discount, according to which the market value of a diversified firm would be less than the sum of the market value of each of its parts if they were independent companies (Berger & Ofek, 1995; Lang & Stulz, 1994; Villalonga, 2004a, 2004b). This agency theory approach was challenged by a resource-based

view though (Grant, Jammine, & Thomas, 1988; Teece, 1982). From this perspective, the benefits of a diversification strategy depend on the nature of resources that can be shared successfully across different product niches (Markides & Williamson, 1994; Teece et al., 1994). Resource-based diversification then would reduce sunk costs, create synergies, and spur higher returns (Feldman & Yoon, 2012). Resource-based diversification literature also advocates going beyond broad definitions of relatedness based on market similarity to focus “on the similarities between the underlying strategic assets of the various businesses that a company is operating in” (Markides & Williamson, 1994: 150)<sup>1</sup>.

Successive empirical works consider whether the extent of corporate diversification predicts performance. In the finance literature, Campa & Kedia (2002) and Villalonga (2004a) challenge evidence of a diversification discount because it is not robust to the application of econometric techniques that overcome endogeneity biases. Villalonga (2004b) also offers evidence of a diversification premium when using U.S. Census rather than Compustat data to construct firm diversification proxies. In strategic management domains, a substantial theoretical and empirical debate (Palich, Cardinal, & Miller, 2000) led to a consensus view, predicting an inverted U-shaped effect of the diversification–performance linkage (Markides, 1992; Wernerfelt & Montgomery, 1988). Related diversification enhances firm performance by exploiting resource complementarities and the resulting economies of scope and learning, but unrelated diversification is associated with lower performance. In this paper we study within industry

---

<sup>1</sup> Our theoretical approach is closely linked to the relatedness literature. According to this literature two sectors are related when there are key resources that coincide in both sectors (Markides & Williamson, 1994; Silverman, 1999). In this paper, we assume that both brand and shelf space are key resources that can be shared or transferred across the different product niches. In our theory, synergies are analyzed more from a demand side perspective, so that brand is a key scale free resource that can increase demand for multiple products and shelf space is a key non scale free resource that can be redeployed from one product niche to another.

diversification (Zahavi & Lavie, 2013; Wu, 2013); thus our theory should apply in environments with a high level of business relatedness.

### **Leveraging scale free versus non-scale free resources**

The distinction between non-scale free and scale free resources has gained some traction in the diversification literature (Helfat & Eisenhardt, 2004; Levinthal & Wu, 2010; Sakhartov & Folta, 2014). As we explained in the introduction, the former cannot be applied across different business activities or products, whereas the latter are not subject to usage limitations and can be shared across various applications. Helfat & Eisenhardt (2004) and Wu (2013) propose that economic value can be created in the presence of non-scale free resources over time, with a real option logic (Folta et al., 2016). Even without intratemporal economies of scope (Helfat & Eisenhardt, 2004), diversified firms might enjoy advantages over specialized firms if they can redeploy their resources across time more effectively. A product niche within a diversified firm thus may underperform relative to specialized competitors at a given point in time, but the overall diversifier's performance should outperform the specialized firms.

In accordance with this logic, it seems unlikely that the value creation properties of diversification would be independent of dynamic processes within portfolios (Ahuja & Novelli, 2017), which can be diverse. For example, Sakhartov & Folta (2014) note a trade-off between the intratemporal value created by synergies of scale free resources and the intertemporal value generated by their adaptation, especially in settings marked by high uncertainty. With a focus on demand dynamics and a demand-based view on value creation (Bowman & Ambrosini, 2000; Priem, 2007), we seek to disentangle the linkage between resources, firm growth, and scalability (Gancarzyk, 2016). An asset owned by a focal firm should provide a competitive advantage when it increases the benefits to consumers of purchasing the firm's products or services.

Enhanced consumer benefits then should affect willingness to buy the product, ultimately prompting increased product sales. In this view, supply-side and cost efficiency considerations represent fixed firm components, so they recede to the background.

Because a scale free resource can be applied without exhaustion in different domains, and its application in a focal niche does not limit its application in other niches, each product niche links simultaneously to this common resource, which provides returns through synergies (Henderson & Cockburn, 1996; Teece, 1982). For example, a car manufacturer might use its brand to promote financial services and loans to consumers (Ye, Priem, & Alshwer, 2012). Sharing a brand can increase niche performance, because consumers extrapolate positive brand attributes to the new product. A brand's reputation reduces consumers' uncertainties about the utility they will obtain from buying an unknown product (Sharp, 2010), and this benefit can be passed to a similar product in a different niche, offering a similar reduction in uncertainty. Sharing a scale free resource like a brand across product niches also implies that any shock that positively affects the value of the shared resource in one niche evokes similar performance effects in other niches. For example, reinvigorating the brand through a successful advertising campaign likely improves performance in all niches sharing that brand. Any negative shock to a shared resource (e.g., failed battery technology in smartphones) also will exert an impact in the same direction on all products that use that resource (e.g., laptops, tablets, servers). The same scale free feature that allows firms to leverage the same resource to expand into a new niche means that any positive or negative feedback will affect all products that share that resource. Customers' utility, gained from consuming each product, depends on this common resource, so their response will be generally *uniform* across businesses. We posit that two product niches in a portfolio that are linked by the same scale free resource exhibit interdependence and positive

Accepted Article

correlation in their growth rates (no causation implied). This mechanism echoes Shaver's (2006: 962) prediction that the "integration of the two businesses, in a way to effectively capture synergies, makes them more interdependent." Firms that base their diversification strategy on scale free resources should display a rising-tide-lifts-all-boats effect, so good (bad) performance in one product niche is linked to good (bad) performance in the rest of the product niches in which the firm is active.

In contrast, with non-scale free resources, diversifiers create a competitive advantage by fine-tuning their resource allocation across product niches, according to their relative productivities (Helfat & Eisenhardt, 2004; Lieberman et al., 2017). This strategy maximizes growth by optimizing resource allocations sequentially across time and product niches, given variations in external business opportunities, so that "profits [in a product niche] may be sacrificed if firms reallocate resources to maximize total profits" (Wu, 2013: 1285). If a non-scale free resource reveals decreasing returns in one product niche, some of it can be diverted and applied more fruitfully to product niches with higher returns, thereby enhancing the performance of one niche at the expense of the other. For example, greater shelf space increases sales growth by enhancing the product's visibility and reducing consumers' search costs at the point of sale (Curhan, 1972). Lower search costs enhance the product's competitive advantage relative to competitors' (Bowman & Ambrosini, 2000), but the scarce resource can be allocated to one product only, to the detriment of all others. That is, it lowers the search costs for one product while increasing the search costs for another product whose shelf space allocation has been reduced or eliminated. These products then would exhibit negative correlations in their growth rates, driven by the firm's internal reallocation of shelf space. The product with enhanced shelf space would grow sales at the expense of the product with diminished shelf space. The

more a firm diversifies by leveraging non-scale free resources, the more it relies on a resource redeployment logic, because it encounters more growth opportunities due to variations in external business opportunities, and the opportunity costs of using some resource capacity for a particular business application increase. Instead of a rising tide lifting all boats, a negative correlation in product niche returns should dominate when the firm diversifies its portfolio using non-scale free resources.

### **HYPOTHESES DEVELOPMENT**

This distinction between scale free and non-scale free resources, and the corresponding synergetic or competitive relations in the product portfolio, can shed new light on the relationship between diversification and macro-level firm growth opportunities. Regarding non-scale free resources, it is important to stress that the predicted competitive relations at the micro-level result from a resource reallocation that seeks the best use of capacity-constrained resources across product niches. This logic generates economic value only if the distinct products reflect distinct business opportunities (Grullon, Lyandres, & Zhdanov, 2012). If all product niches have the same (good or bad) economic prospects at the same time, no gains can come from redeploying resources away from a product niche with poor prospects to others; it will not lead to higher returns.

Assume though that various opportunities are available, linked to different products within the same firm portfolio. Resource redeployment across product niches by a diversifying firm that aims to exploit its non-scale free resources will lead to greater performance variability in response to changes in the external environment. In this case, sales suffer from the external shock, so the firm works to redeploy resources away from niches that have been strongly affected and toward those that have not suffered the shock, or at least experienced it less

negatively. Overall, resource redeployment should univocally lead to a higher level of firm sales growth since the decrease in sales in the niche affected by a negative shock should be more than compensated by the increase in sales in the niche to which resources have been reallocated. If this condition is not met, firms will not activate resource redeployment.

Formally we hypothesize:

*Hypothesis 1: A greater redeployment in the product portfolio of a firm that shares non-scale free resources across niches affect positively overall firm sales growth.*

According to Sakhartov & Folta (2014), synergies and redeployment across product niches are distinct, almost incompatible tactics that diversified firms use to create value. We elaborate on this point according to a classical entry-and-exit redeployment perspective (Helfat & Eisenhardt, 2004). In that view, redeploying non-scale free resources from one niche to another means that the firm exits some niches, even though it had been achieving synergies. The exit reduces those synergies.

If firm  $i$ , with its two products A and B, has a scale free resource shared across those two products, it generates synergies, and any shock that affects the sales of product A spills over to influence sales of product B. Synergetic movements occur in the same directions; if two products share a common brand, the enhanced popularity of the brand in one product niche implies more positive effects on sales in the other niche (e.g., increased Apple iPhone sales drove up sales of Apple's Mac computers). In this case, the positive impact of resource redeployment from product A to product B on firm sales diminishes, because exiting the niche of product A eliminates any synergy-based advantages. We anticipate similar effects even in the less extreme case of cutting some allocations of non-scale free resources, rather than completely exiting the

Accepted Article

niche. For example, advertising expenditures have nonlinear threshold effects on customer behavior (Sen, 1997; Vakratsas, Feinberg, Bass, & Kalyanaram, 2004). If firms want to benefit from the synergies created by a common brand, they must invest some minimum amount in advertising to highlight the brand's value offering. A reallocation effort that reduces the advertising budget for one product below the minimum level would not be sufficient to evoke demand synergies, similar to the effect of a niche exit. Therefore, we predict both that scale free and non-scale free resources are linked and that if the redeployment exceeds a minimum non-scale free resources threshold for facilitating synergies created by the scale free resource, it may be detrimental to the company overall. A reallocation process that sequentially reduces shelf space for some products could go so far that it leads to the disappearance of the brand's one-stop-shop effect, which had been generating sales on the basis of its strong image. The negative effect of redeployment processes, relative to synergy effects, should be more detrimental when the synergies have had greater impacts on performance. Logically, the greater the value of the scale free resource, the greater the value that its corresponding synergies should offer across lines of businesses (Markides, 1992; Teece, 1982), leading to a weaker positive effect of redeployment actions that increase variance in the product portfolio on performance. Formally,

*Hypothesis 2: The value of scale free resources negatively moderates the relationship between resource redeployment and firm overall sales growth of a firm that shares scale free resources across niches..*

## **METHODOLOGY**

### **Data and sample**

We drew study data from the Euromonitor Passport, which provides statistics, analyses, and reports on industries, countries, and brands worldwide. The Passport data set has been used extensively in marketing literature (e.g., Chandrasekaran & Tellis, 2008; Griffith & Rubera, 2014); it was first published in 1972, and it currently provides comprehensive coverage for 80 countries and 27 major industries (Treptow, 2017). Our data span 2008–2013 and the seven largest EU countries by gross domestic product (GDP) (France, Germany, Italy, Netherlands, Norway, Spain, and Sweden), plus the United Kingdom, representing five industries (body care, consumer electronics, drugs, home appliances, and homecare). As an important common factor, all these industries rely on shelf-space considerations, reflecting a peculiar feature of the Passport data set, for which “store checks are an integral part of ... data collection methods.”<sup>2</sup> Shelf space, or distribution channels more generally, represents a non–scale free resource that can be redeployed easily across product niches. Brands are scale free resources in this context (Teece, 1982; Wu, 2013). Our sample includes brands such as Samsung, Sony, Canon, Nokia, Chanel, Colgate, Estée Lauder, Gillette, and L’Oréal—that is, some of the “2015 Most Valuable Brands.”<sup>3</sup> We consider extensions by these brands, which create important demand synergies across product niches (Amaldoss & Jain, 2015) and have been analyzed in marketing literature from customer perspectives (Monga & John, 2007) and as a means for value creation (Hennig-Thurau & Houston, 2009); management literature has addressed them only more recently (Gao & Hitt, 2012). Our sample selection criteria include ensuring variation in the demand and competition levels due to heterogeneous industry conditions, by including products with varying lifespans, prices, and production techniques. The market reference we investigate for each industry reflects the country level; for multinationals, we assume a multidivisional form, such

---

<sup>2</sup>See [www.portal.euromonitor.com/portal/help/methodology](http://www.portal.euromonitor.com/portal/help/methodology)

<sup>3</sup> See <http://www.forbes.com/powerful-brands/list/>

that every country division likely manages its own shelf space allocations (Ghoshal & Nohri, 1993). A company enters the data set if one of its brands acquires at least 0.1 percent of the national market share in one product niche<sup>4</sup>. The data account for mergers and acquisitions, though we do not distinguish organic from external growth. According to an interview we conducted with a marketing director of a multinational, diversified company that sells candy, chocolate, and gum in supermarkets (2 billion Euros in sales, 14,000 employees), shelf decisions ultimately belong to retailers, but because they enter into close partnerships with brand manufacturers, they often welcome proactive suggestions from manufacturers about the best allocation of their products according to their shelf capacity.

Our analysis at the niche level pertains to 45 product niches, which correspond to 5- and 6-digit North American industry classification system (NAICS) codes. Our data are country and time variant, so from Passport, we also retrieved brands' and companies' sales at the niche level, across countries and times. The descriptive statistics in Table 1 reveal the niches across industries, which are heterogeneous in their main variables. The diversified companies in our sample sell products simultaneously in at least two niches in the same year and country (column 3, Table 1).

Insert Table 1 about here

### **Analytical approaches**

We divided the empirical analysis into two steps. With our data, we cannot claim causality, but with a dual analysis, we can establish the validity of our findings. Thus, as our empirical strategy, we propose a first analysis at the niche level to investigate sales growth rates

---

<sup>4</sup> The truncation occurs at 0.1% of the market share of the brand in the niche (not of the company), within the industry of reference. The only risk of underrepresentation is if diversified firms attain market share less than 0.1% in *all* niches, in a given year, in a given country.

within each firm portfolio where we define a firm portfolio as the set of products each firm sells within one country at each point in time. In the resulting set of regressions, we check the empirical consistency of our predicted theoretical mechanisms: Scale free resources generate synergies (positive correlations), and non-scale free resources reflect a redeployment logic (negative correlations). We perform an intraportfolio analysis with an ordinary least squares (OLS) panel at the niche-brand-company-country-year level, with all controls and introducing fixed effects for the brand, niche, firm, country, and year. The standard errors are clustered by firm. We thus highlight structural correlations across niches in a firm product portfolio that has been cleared of time-invariant unobservable heterogeneity. Next, as a second step, we move to the firm level and corroborate our predictions empirically by relating the average portfolio variances to corporate sales growth. Across these two steps, most of the variables stay the same, but we adopt different observation levels.

### **Analysis 1: Dyads of niches**

*Dependent variable.* In all our analyses our dependent variable is *Sales Growth*. For Analysis 1, we measure it at the niche level. For each product niche in which a company competes, we computed the ratio of sales in a focal product niche over two consecutive years in a specific country ( $Sales\ Growth = Sales_t / Sales_{t-1}$ ). Values greater than 1 indicate sales growth; values less than 1 signal a sales decrease. Sales growth is a classical dependent variable in diversification studies. (Hashai, 2015; Tanriverdi & Lee, 2008; Zahavi & Lavie, 2013). Measuring sales growth at the niche level can reduce the confounding effects of productivity gains at a corporate level that might be wrongly attributed to a single niche, but it also omits synergies due to cost efficiencies that are not included in firm fixed effects.

*Independent variable.* The independent variables differ, reflecting the distinct purposes of our two analyses. For Analysis 1, at the niche level, the baseline independent variable is a measure of sales growth over two consecutive years of a product niche that is separate from the niche that provides the input for the dependent variable but appears in the same firm portfolio. We label this independent variable *Paired Niche Sales Growth*, because for every diversified firm, we create a dyad of dependent–independent variables by linking the sales growth of every niche in which it sells products.

Consider a concrete example from our sample. The company Candy competes in three product niches: (i) dishwashers, (ii) refrigerators, and (iii) cooking appliances. These niches can be paired like dyads as (i) dishwasher vs. (ii) refrigerators, (i) dishwasher vs. (iii) cooking appliances, or (ii) refrigerators vs. (iii) cooking appliances. For our estimations, we consider the *Sales Growth* of the product niche dishwasher (Y) with respect to the *Paired Niche Sales Growth* of the product niche refrigerators (X); the *Sales Growth* of the product niche dishwasher (Y) with respect to the *Paired Niche Sales Growth* of the product niche cooking appliances (X); and the *Sales Growth* of the product niche refrigerators (Y) with respect to the *Paired Niche Sales Growth* of the product niche cooking appliances (X). The niche indicated by Y is the dependent variable; the one identified by X is the independent variable. In matching niches, we exclude paired niche duplications but otherwise exhaust all possible combinations. Identifying a niche as the dependent or independent variable is a random assignment, according to a matching algorithm. With this matching, we can empirically verify the existence of a correlational structure between niches in the same product portfolio, because we can test if the *Sales Growth* of one product niche (e.g., dishwasher) correlates positively or negatively with the *Paired Niche Sales Growth* of another (e.g., refrigerator) in the product portfolio of the same company. Figure

1 illustrates how we build observations for our regressions. To our knowledge, this effort is the first regression to pair different niches in a firm product portfolio across time.

Insert Figure 1 about here

We capture the presence of a scale free resource with a *Dummy Scale Free* variable that takes a value of 1 if, for two paired product niches, the firm uses the same brand. The *Non-Scale Free Niches* variable counts the number of niches in a firm portfolio that are not linked by the same brand. *Scale Free Niches* counts the number of niches in the portfolio that use the same brand. The variables vary over time and firms. In summary, we estimate the following equation:

$$\text{Sales Growth}_{(ijtc)} = \text{Paired Niche Sales Growth}_{(wjtc)} + \text{Paired Niche Sales Growth}_{(wjtc)} \times \text{Dummy Scale Free}_{(ijtc)} + \text{Paired Niche Sales Growth}_{(wjtc)} \times \text{Non-Scale Free Niches}_{(ijtc)} + \text{Non-Scale Free Niches}_{(ijtc)} + \text{Scale Free Niches}_{(ijtc)} + \text{Dummy Scale Free}_{(ijtc)} + \text{Controls} + \text{errors}^5. \quad (1)$$

As core coefficients, we use *Paired Niche Sales Growth*  $\times$  *Dummy Scale Free* to determine if the presence of a common brand increases or decreases the positive correlation of the sales growth of two niches in the firm portfolio. Similarly, *Paired Niche Sales Growth*  $\times$  *Non-Scale Free Niches* indicates if the extent of non-scale free diversification has a positive or negative impact on the correlations among the sales growth of two niches in a firm portfolio.

## Analysis 2: Firm-level analysis

**Dependent variable.** In Analysis 2, our dependent variable again is *Sales Growth*, measured as ( $\text{Sales Growth} = \text{Sales}_t / \text{Sales}_{t-1}$ ), but here, we focus on the firm level.

---

<sup>5</sup> Where:  $i$  is the niche of the company  $j$  at time  $t$  for country  $c$ ; and  $w$  is the paired niche of the company  $j$  at time  $t$  for country  $c$ .

*Independent variables (I): Intratemporal variance as a proxy for resource*

*redeployment*

The rationale of this measure is based on the following theoretical motivations. Consider a firm  $i$  that has two products in its product portfolio, product A and product B. If product A suffers a positive demand shock driven by fluctuations in consumer tastes, we predict that, left safely in the background bounded rationality and behavioral biases (Bardolet, Fox & Lovallo, 2011), firm  $i$  allocates its competing non-scale free resources optimally to the product with the highest marginal productivity. Accordingly, it will move resources from product B and toward product A. The sales of product A then should increase more than they would have, had firm  $i$  chosen not to engage in resource redeployment. The nature of non-scale free resources means that the redeployment causes a competitive, opposite effect on product B sales though, so they should decrease after being deprived of the resources. The difference in the sales growth exhibited by products A and B, due to the initial external shock, thus should be amplified by the redeployment of non-scale free resources. Thus, redeployment increases the portfolio's intrafirm variance more than sector variability inducements.

Granted, the independent variable for Analysis 2 is the firm's intratemporal variance at time  $t$ , defined as the amount of variation in sales growth exhibited by the product portfolio across niches. The variance of firm  $i$  in year  $t$  in country  $c$ ,  $V_{itc}$ , equals:

$$V_{itc} = \sum_{n=1}^{N_{itc}} w_{itcn} (g_{itcn} - \bar{g}_{itc})^2, \quad (2)$$

where:

$$w_{itcn} = \frac{Sales_{itcn}}{\sum_n Sales_{itcn}} \text{ and } \bar{g}_{itc} = \sum_{n=1}^{N_{itc}} w_{itcn} * g_{itcn}, \quad (3)$$

such that  $g_{itcn}$  represents the growth rate in year  $t$  of niche  $n$  for firm  $i$  in country  $c$ , and  $N_{itc}$  represents the number of niches in which firm  $i$  compete in year  $t$  and country  $c$ .

Thus, we can determine the standard deviation, at time  $t$ , of sales growth across all product niches linked by the same brand (*Scale Free Variance*) and those not linked by the same brand (*Non-Scale Free Variance*). To address potential size effects, we divide them by the number of scale free and non-scale free niches, respectively (Henkel, 2009). These measures have theoretical consistency: More redeployment should increase the firm's intratemporal variance at time  $t$ , because firms simultaneously invest more in growing sectors and decrease their investments in shrinking ones, amplifying the environmental dynamics (Wu, 2013).

***Independent Variable (II): Value of scale free resources***

High value brands are more capable of generating one-stop-shop effects and apply more readily to extensions (Amaldoss & Jain, 2015; Del Vecchio & Smith, 2005; Monga & John, 2007). To measure brand value, we rely on our regressions from Analysis 1 (Table 4, Model 4). We extract the fixed effect component estimated for each brand with the dummy (*Scale Free Value*), which represents the impact of a single brand on the sales growth in a focal niche-firm-country-year observation. Then, we average this component at the firm-country-year level. It is worth to note that this measure varies across years, so that we take into account any dynamic movement of a new brand extension of a company across niches.

***Control variables.*** All the control variables definitions are available in Table 2. With *Diversification*, we check whether two companies with similar diversification levels might feature different portfolio correlation structures. We also acknowledge that changes across niches might be due to factors other than company synergies or reallocation activities. Therefore, we

Accepted Article

introduce controls for paired niches (*Niche Demand*, *Paired Niche Demand*, *Niche Competition*, and *Paired Niche Competition*), to avoid the possibility that dynamics due to external industry factors that affect the niche on either side of the equation might bias our estimation. We also introduce the average difference in demand growth rates in paired niches, or *Demand Difference*  $= (Niche Demand_{i,t} - Paired Niche Demand_{w,t}) / (Niche Demand_{i,t} + Paired Niche Demand_{j,t})$ , to control for possible spillover effects due to demand changes across paired niches, that is, whether they exhibit the same growth direction or not.

Because we want to identify only the variance generated by firm redeployment actions, not environmental changes, we include *Sector Variance* to proxy for environmental turbulence; it equals the firm-weighted (firm sales per niche) standard deviation in sales growth generated by all competitors in a particular niche, except the focal firm. We thus obtain standard deviations for each niche, country, and year of sales growth achieved by all competitors

At the company level, we introduce total firm sales, *Company Sales*, to proxy for scale effects.<sup>6</sup> The number of product versions that a company sells within the same niche across countries provides a proxy for a versioning strategy (Shapiro & Varian, 1998) (*Versioning*); it can be interpreted as a measure of vertical differentiation inside a niche. Finally, at the country level, we control for *Country Competition*, total *GDP* to reflect the country's economic size, *Country FDI Inflows* and *Outflows* to represent economic internationalization according to foreign direct investment, the *Country Price Index*, and private *Consumption Expenditures* as a proxy for actual consumption. These data, from the OECD, vary by time and country and help us

---

<sup>6</sup> In Analysis 2, *Company Sales* is calculated in all countries to avoid automatic correlation with the dependent variable.

avoid confounding effects of dynamics at the country level. Tables 2 and 3 provide the definitions of the variables, their basic descriptive statistics, and the variable correlations.

In summary, the equation for Analysis 2, with fixed effects and errors clustered by firms (the regression fixed effects are  $id = \text{firm}$  and  $\text{country}$ ,  $\text{time} = \text{year}$ ), is:

$$\begin{aligned} \text{Sales Growth}_{(itc)} = & \text{Non-Scale Free Variance}_{(itc)} + \text{Scale Free Variance}_{(itc)} + \text{Scale Free} \\ & \text{Variance}_{(itc)} \times \text{Scale Free Value}_{(itc)} + \text{Scale Free Value}_{(itc)} + \text{Sector Variance}_{(itc)} + \text{Controls} + \\ & \text{errors.} \end{aligned} \quad (4)$$

Insert Tables 2 and Table 3 about here

## RESULTS

### Analysis 1 results: Checking theory mechanisms

In Table 4, the results of the OLS regression with fixed effects include the baseline Model 4.1, and well as Models 4.2–4.4, which progressively add each variable of interest. The *Paired Niche Sales Growth* coefficient reveals an overall positive effect; a corporate influence evokes a positive correlation across product niches in the portfolio. Combining *Paired Niche Sales Growth* and *Dummy Scale Free* always produces a positive sign, with a  $p$ -value lower than 1 percent. Two product niches linked by the same brand within a firm portfolio thus tend to show more positive correlations in their sales growth rates. On the contrary, the interaction of *Paired Niche Sales Growth* and *Non-Scale Free Niches* is always negative, and its  $p$ -value is lower than 5 percent. The results in Table 4 do not provide explicit evidence to test our hypotheses, but they offer empirical support for the predicted mechanisms: The more a firm diversifies using non-scale free resources, the more negative the correlation is between two product niches that are not linked by a brand.

Insert Table 4 about here

In terms of marginal effects, the jump of the *Dummy Scale Free* variable from 1 to 0 increases the correlation from 1.04 percent (95% interval from 0.64% to 1.43%) to 3.37 percent (95% interval from 2.18% to 4.71%), significant at the 1 percent level (standard error = 0.008), when we keep all other variables at their means. Furthermore, we find that *Non-Scale Free Niches* is positive, with low *p*-values, whereas *Scale Free Niches* exhibits large *p*-values. Thus, we cannot reject the possibility that the impact of the latter is null, consistent with the idea that more niches, in accordance with a redeployment logic, increase the sales growth of any single niche. This effect is due to the number of options available. It should not hold for scale free resources functioning according to a synergy logic though.

### **Analysis 2 results: Hypotheses testing**

In Table 5, we report the results of an OLS fixed effect regression, collapsed to the firm level. Model 5.1 is the baseline, and Models 5.2–5.6 add the covariates of theoretical interest. From the baseline model to the full specification, the R-square value increases by about 32 percent. In support of Hypothesis 1, *Non-Scale Free Variance*, our proxy of resource redeployment, has a positive impact on firm sales growth (*p*-values consistently less than 10%). The more firms engage in resource redeployment across niches in their portfolios, the higher their sales growth rates. For Hypothesis 2, we do not find any direct effect of *Scale Free Variance* until it interacts with *Scale Free Value*; the negative interaction effect reveals a *p*-value lower than 10 percent. When a resource has more value, it generates greater synergies (positive direct sign of *Scale Free Value* with significance less than 1%), and redeployment actions are more disruptive to firm growth. These findings support Hypothesis 2.

In Figure 2 using the coefficients of from Table 5, Model 6, we depict the predicted firm growth rates with our sample values for the variables of interest, namely, *Non-Scale Free Variance* and *Scale Free Variance* with confidence intervals. The graphs confirm our findings. Non-scale free variance has a positive impact on firm growth rates while the impact of *Scale Free Variance* is negative and even more negative for higher values of scale free value. It also is worth noting that *Scale Free Variance* has a negative impact on firm sales growth when *Scale Free Value* is at its highest level, confirming the disruptive effect of redeployment on synergies. In Figures 3 and 4 we provide the three-dimensional simulations of our results (based on the coefficients of Table 5 - Model 6). In the Figure 3 we represent along the axis the variables *Scale Free Variance* and *Scale Free Value* from their respective minimum to their maximum values with the *Sales Growth*. Similarly; in the Figure 4 we depict the variables *Non-Scale Free Variance* and *Scale Free Variance* (from their min to their max) with the *Sales Growth*. Both Figures show visually the how the different combinations of the variables are associated to a rate of *Sales Growth*. To have also a monetary interpretation, we can consider that the average Company Sales is 130 million, an increase of 10% (namely, *Sales Growth*=1.1) means 13 million. Thus, moving *Sales Growth* from 0.5 to 1.5, means moving from *Company Sales* from 65 to 195 million<sup>7</sup>.

Insert Table 5 and Figures 2, 3, 4 about here

The interaction between *Scale Free Variance* and *Non-Scale Free Variance* also produces an interesting result. It is negative with low standard errors—a stylized fact that supports the idea that non-scale free resources require coordination mechanisms different from

---

<sup>7</sup> More precisely, in the case of Figure 3, moving from the two extreme cases (min and max of the two variables), we register a change equals of 59 million, with a range of 5 percentage confidence interval of about 33 to 86. If we restrict these min and max values cutting 10% percentile in distribution tails of Scale Free Variance and Scale Free Value (i.e, focusing on 80% of observations around the means), the prediction is 38 million, with a range of 5 percentage confidence interval of 35 to 40.

those demanded by scale free resources. The simultaneous use of both types generates a negative effect, due to the conflicting incentives they create. Non-scale free resources require redeployment and generate more variance, which can hinder the exploitation of synergies of shared scale free resources, in line with the overall results of our regressions.

Among the controls, a significant level of competition exerts a negative effect on sales growth, at both the niche (*Competition*) and industry (*Country Competition*) levels. Foreign direct investment inflows, as proxies for international competition, produce a negative sign, whereas the outflow is positive. The positive sign of *Company Sales* suggests a size advantage and perhaps some non-observable scale economies. The expected negative sign of *Country Price Index* indicates that higher inflation diminishes growth. No other controls are significant.

#### **SUPPLEMENTARY ANALYSIS**

We first interviewed the chief financial officer (CFO) of a multinational, diversified company in the clothing industry, which maintains direct ownership of physical shops and earns sales of about 2.5 billion euros worldwide. The interview (details available on request) supports several findings from our quantitative analysis. When describing sales growth, the CFO noted the “*rules of thumb to allocate financial resources and resources in general across the product portfolio, and the logic considers the relative success of one product line with respect the others. We usually follow different performance indicators such as the margins and, with the budgeting planning, also some forecasts, but the sales rate are and stay one of the first and most important indicators*”. Second, the CFO acknowledged brand synergies and how resource reallocation can jeopardize them , explaining that “*In our corporation we have four different products lines of clothing targeting different types of consumers, [and] all of them have a similar brand that links all the products. The most expensive brand line is usually the one that has priority for resource*

*allocation, because it is usually the one that pulls the overall product portfolio. It might happen that we are asked to reallocate resources from our premium brand line if it is not performing so well quarterly or yearly to another product line that temporarily is selling more. However, I cannot completely cut resources to the highest premium product line and brand, because they create also benefits indirectly and a minimum investment must stay”.* Third, as a further validation of our theoretical elaboration related to resource deployment and heterogeneity in sector growth rates, the CFO recognized that *“if I must make a decision of resource allocation when having, for instance, shoes on the rise, stable bags, and perfumes in great decline, this is not positive or negative news. It depends. Clearly, we all would like to have all sectors and products lines rising steadily—this would be the optimal scenario—but it is not always the case. The important thing is having sectors that grow more than others or product lines that sell better. This gives us more margins to allocate resources”.*

Empirically the, we have performed a battery of supplementary analysis that we report in the online appendix. First, we have checked whether our results might be driven spurious outcomes of our regression design following a simulation approach suggested by Bennet and Feldman (2017) and we conclude that our main results cannot be replicated by a random simulation of our variables. Second, we checked the consistency of our results for alternative measures of brand value finding qualitatively the same results. Third, although the estimation of the *Scale Free Value* is company and time dependent, we ran an additional test to decrease issues of its endogeneity using companies that change their brand extension strategies. This new test confirms the general evidence reported in the paper. Fourth, we introduce the results of portfolio analysis into the firm-based analysis, investigating whether a negative (positive) correlation between niches leads to a higher (lower) impact of *Non–Scale Free Variance* on firm growth.

We find that *Non-Scale Free Variance* exhibits a greater coefficient when the niche correlations are negative, indicating redeployment. Analogously, the negative effect of *Scale Free Variance*  $\times$  *Scale Free Value* is more negative when there are positive niche correlations, or synergies. Fifth, we investigate the potential impact of online sales. We find that online sales hamper redeployment advantages and lower the importance of shelf space. Sixth, we test if relatedness affects resource redeployment, an analysis that inevitably is complicated by a potential trade-off: Relatedness reduces the cost of redeployment, but it increases the presence of synergies (Lieberman et al., 2017). When we introduce a proxy of relatedness as a new variable in our regression we obtain similar results. Interestingly, we find that the more related the diversification, the greater the probability of scale free diversification, a setting in which resource redeployment compromises the benefits of synergies. Seventh, we ran our main regressions with the dependent variable at  $t + 1$  to alleviate potential simultaneity concerns and only with a subsample of firms that change their brand extension. The results remain unchanged. Finally, referring to the economic literature on growth, we ran additional analysis by cutting the 5% outliers of the sales distribution – common practice in the research about Gibrat’s Law (Bottazzi & Secchi, 2006) – to reduce possible estimations’ bias coming from a long distribution tail of our dependent variables. Results of the additional analysis (both at niche and firm level) confirm the main results reported.

## CONCLUSIONS

This article investigates the relationship between intratemporal variance as a proxy of resource redeployment in a product portfolio and firm sales growth rates (Henkel, 2009), by also considering the influences of scale free resources (Hashai, 2015; Helfat & Eisenhardt, 2004; Sakhartov & Folta, 2014, 2015; Wu, 2013). We propose a theoretical explanation of variation in

Accepted Article

sales growth rates within a firm's product portfolios and test it empirically, using five industries and 45 niches. Non-scale free resource redeployment (Levinthal & Wu, 2010) produces negative correlations among the growth rates of different product niches, whereas scale free resources create positive correlations (Feldman & Yoon, 2012; Teece, 1982). The firm-based regressions confirm that in the case of non-scale free resources, more available options and intense redeployment relate positively to firm growth rates. However, redeployment with valuable scale free resources (e.g., brands) exerts a negative impact on growth rates. These results suggest new directions for diversification research (Rumelt, 1982). In particular, firms' abilities to manage synergies or apply redeployment logics are key predictors of the positive relationship between their diversification efforts and their growth (Silverman, 1999; Tanriverdi & Lee, 2008).

Different types of diversification produce different links between firm growth and redeployment in the firm portfolio though. A redeployment logic implies negative correlations and individual product growth rates that overreact to changes in the external environment. No such outcomes arise for synergies, which instead generate positive correlations. The relationship between portfolio growth and variance thus differs, even for two firms that are equally diversified. These results should prompt further discussion of the processes that govern diversification.

Organizations that operate in the same product niches, with similar levels of product diversification, still might experience completely different correlations and variances in their product growth rates within their portfolios.

By studying the linkage between firm performance and intrafirm variance performance, we also contribute to ongoing strategic management debates about the so-called Bowman paradox, reflecting the well-documented, empirical, stylized fact that risk and return correlate negatively (Andersen, Denrell & Bettis, 2007; Bowman, 1980; Bettis & Hall, 1982; Bettis &

Mahajan, 1985; Wiseman & Bromiley 1991). As we show, this unexpected negative relationship between performance and variance that constitutes the Bowman paradox is consistent with a diversification strategy based on non-scale free assets. With this strategy, an optimal resource redeployment may decrease variance in firm performance across time, even as it enhances firm profitability.

Synergies versus redeployment in turn have implications for analyzing the links between diversification and growth opportunities, as partially investigated in prior management literature. First, firms seeking to diversify require different skills and capabilities, depending on their strategy. If they rely on scale free resources, they need coordination skills to reinforce their ability to exploit synergies (Henderson & Cockburn, 1996) and minimize potential negative contagion effects (Shaver, 2006). If instead they turn to non-scale free resources, they should improve their adaptation skills (Brahm et al., 2017) and leverage their ability to reassign resource capacities quickly to different product niches, according to their marginal productivity.

Second, firms with non-scale free resources may compete in product niches that underperform at some moment in time, because they suffer from reallocation processes, such as when they leave the market completely (Wu, 2013). Yet precisely for this reason, their overall corporate growth rates ultimately may be better than those achieved by competitors. For diversification driven by non-scale free resources, the most important strategic issue is the optimal allocation of resources. The optimization problem is complex, involving several variables that interact dynamically, including constraints on resource capacity (Sakhartov, 2018), increasing and decreasing returns from applying a resource to a particular market niche (Helfat & Eisenhardt, 2004), different product niche economic returns (Wu, 2013), and learning effects of diversification that create excess capacity (Mitchell, 2000). This problem resembles a system of

Accepted Article

complex differential equations, which computer simulations and new advances in mathematical algorithms could help solve (Sakhartov & Folta, 2014). Notably, mathematical and simulation techniques have solid footing in financial realms, but their application to product diversification decisions is less frequent, despite the potential insights they could provide. Managers who leverage such competencies to analyze their product diversification strategies thus might gain a solid competitive advantage. They should particularly account for adaptation costs (Hashai, 2015), as accrue for resource reallocations. The more flexible an organizational structure is in terms of moving non-scale free resources across niches, the better it can perform. Inertia or resistance may hamper the exploitation of such resources, and this recognition is critical for managerial decisions, because not all resources can be moved at the same pace across market applications.

To manage diversification by scale free resources, companies instead should focus on sectors in which the resources can enhance synergies, in line with classical corollaries describing related or coherent diversification (Feldman & Yoon, 2012; Henderson & Cockburn, 1996; Markides, 1992; Wernerfelt & Montgomery, 1988). Returns within a portfolio tend to correlate positively, even if the product niches do not at the industry level. The first task of a manager thus should be to estimate the existence and size of these synergies, which can be a costly endeavor. Cadbury invested about US\$10 million to evaluate its potential diversification synergies, if it were to acquire Adams for example (Collis et al., 2012). At a minimum, companies should determine the number of niches to add to their portfolio by defining how far their resources can extend to different applications, according to two factors: whether the resource generates positive profits in a focal niche and how much the application of the resource in that niche generates positive synergies with other niches in the portfolio. Entry and exit decisions often are more

Accepted Article

difficult than anticipated, because a resource may be extended to (or maintained in) a new product niche, even if it creates negative returns; it is sufficient that the sum of positive synergies with other niches is greater than this loss. In turn, managers should realize the importance of investing in different competencies, according to the two types of resources. In this respect, future investigations could focus specifically on diversification processes that might exploit these two logics simultaneously. Given the different costs, incentives and learning structure that synergies and redeployment create, we are still agnostic on whether and how they could create value at the same time. Inasmuch as these stylized facts hold, exogenous sector variability should provide better growth opportunities to diversified firms that redeploy non-scale free resources. Without industry variability, no efficiency gains are possible from redeployment (Folta *et al.*, 2016). If diversification strategies instead entail sharing scale free resources, the variability of market opportunities likely has only a marginal impact on firm growth, which depends more on generated synergies. This conclusion has important implications for managers; when redeployment is a key factor of competitive advantage, sector analysis tools that predict idiosyncratic trends across niches better than competitors are able to do could be source of competitive advantage. The more accurate the predictions about product niche trends are, the stronger the advantages these firms can develop, especially if they also gain first-mover advantages.

Some limitations of this study represent avenues for further work, and they give implications for theory generalizability. With our demand-side perspective (Priem, 2007; Ye *et al.*, 2012), this work is agnostic about the efficiency gains of diversification at the corporate level, beyond firm-country-year fixed effects. Yet we still note the importance of growth opportunities through diversification. Consequently, our concept of relatedness, and thus of

Accepted Article

synergies and redeployment costs, is linked more to demand than supply side; to revenues rather than operative costs. In this respect, an ideal extension is in contexts where diversification is not only bounded to cost savings, and adaptation and coordination costs are not a key determinant of performance (Hashai, 2015). We focus on industry sectors in which resources such as shelf space and brands can support diversification. Shelf space is a specific non-scale free resource quite different from a classical product input; its redeployment costs and flexibility are clearly divergent from those of other resources, such as managerial attention or production plants. Placing on a shelf a perfume or a soft-drink is not like moving managerial time across these two products. Similarly, brands are specific scale free resources here studied under a revenue-generating perspective, more than a source of advertising scale economies. In sum, our results are dependent on a scale free resource that generates revenues synergies, and a non-scale free resources with medium/low redeployment costs. More sector-specific studies thus could help validate our findings by introducing and testing the variations in these dimensions. Additionally, we are proposing a novel methodology to estimate brand value, but we are aware that a new paper could replicate our intuition with finer regression methods, adding a validation section with industry and marketing experts, or matching with the data with the firm stock market performance. Finally, we explicitly rely on the assumption that a firm can optimally reallocate non-scale free resources across niches, such that we purposefully exclude the potential impact of organizational rigidity (Rawley, 2010) or any difficulties due to bounded rationality (Bardolet et al., 2011). We thus capture the distinct average effects of two types of diversification, but we do not provide an in-depth consideration of which firm-based features (e.g., rationality vs. myopia) might make non-scale free resource diversification more effective in one company over another, for example. We leave such efforts to further research.

## ACKNOWLEDGEMENTS

The authors thank Brian Wu, Constance Helfat, and two anonymous reviewers for comments and suggestions. All the different versions of this paper benefited from feedbacks at the 2016, 2018, and 2020 Academy of Management Conference; the 2017 Strategic Management Society Conference; the 2018 Wharton Corporate Strategy and Innovation Conference, the 2016 Ghoshal Conference; and from helpful comments provided by seminar participants at Bocconi University (2014), University of Bath (2014), Católica Lisbon School of Business and Economics (2017), TUM (2018), IE Business School (2018). The authors thank Elena V. for the interviews. Juan Santaló thanks the funding of State Research Agency (AEI) -10.13039/501100011033 Grant No. PID2019-111422GB-I00. Marco Giarratana and Martina Pasquini thank State Research Agency (AEI) -10.13039/501100011033 Grant No. PID2019-104568GB-100. The authors also thank Bocconi University Library, where initial data were downloaded. All errors remain ours.

## REFERENCES

- Ahuja, G., & Novelli, E. (2017). Redirecting research efforts on the diversification–performance linkage: The search for synergy. *Academy of Management Annals*, 11(1), 342–390.
- Amaldoss, W., & Jain, S. (2015). Branding conspicuous goods: An analysis of the effects of social influence and competition. *Management Science*, 61(9), 2064–2079.
- Andersen, T.J., Denrell, J., & Bettis R.A. (2007). Strategic responsiveness and Bowman’s risk-return paradox. *Strategic Management Journal*, 28(4), 407–429
- Bardolet, D., Fox, C.R., & Lovallo, D. (2011). Corporate capital allocation: A behavioral perspective. *Strategic Management Journal*, 32, 1465–1483.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120.
- Barroso, A., & Giarratana, M.S. (2013). Product proliferation strategies and firm performance: The moderating role of product space complexity. *Strategic Management Journal*, 34(12), 1435–1452.
- Bennett, V.M., & Feldman, E.R. (2017). Make room! Make room! A note on sequential spinoffs and acquisitions. *Strategy Science*, 2(2), 100–110.
- Berger, P.G., & Ofek, E. (1995). Diversification's effect on firm value. *Journal of Financial Economics*, 37: 39–6.
- Bettis, R.A., & Hall, W.K. (1982). Diversification strategy, accounting determined risk and accounting determined return. *Academy of Management Journal*, 25, 254–264.
- Bettis, R.A., & Mahajan, V. (1985). Risk/return performance of diversified firms. *Management Science*, 31, 785–799.

- Bottazzi, G., & Secchi, A. (2006). Explaining the distribution of firm growth rates. *The RAND Journal of Economics*, 37(2), 235-256.
- Bowman, E.H. (1980). A risk/return paradox for strategic management. *Sloan Management Review*, 21, 17-33.
- Bowman, C., & Ambrosini, V. (2000). Value creation versus value capture: Towards a coherent definition of value in strategy. *British Journal of Management*, 11(1), 1-15.
- Brahm, F., Tarzijan J., & Singer, M. (2017). The impact of frictions in routine execution on economies of scope. *Strategic Management Journal*, 38(10), 2121-2142.
- Campa, J., & Kedia, S. (2002). Explaining the diversification discount. *Journal of Finance*, (57), 1731-1762.
- Chandrasekaran, D., & Tellis, G.J. (2008). Global takeoff of new products: culture, wealth, or vanishing differences? *Marketing Science*, 27(5), 844-860.
- Collis, D., Stuart, T., & Smith, T. (2012). Cadbury Schweppes: Capturing Confectionery (A). *Harvard Business School Case*, 708-453, September.
- Curhan, R.C. (1972). The relationship between shelf space and unit sales in supermarkets. *Journal of Marketing Research*, 9, 406-12.
- Del Vecchio, 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.
- Denis, D.J., Denis, D.K., & Sarin, A. (1997). Agency problems, equity ownership, and corporate diversification. *Journal of Finance*, 52, 135-160.
- Diestre, L., & Santaló, J. (2020). "Why do firms suffer differently from input stigmatization? The costs of removing stigmatized inputs". *Organization Science*, 31(1), 47-66
- Feldman, M.P., & Yoon, J.W. (2012). An empirical test for general purpose technology: An examination of the Cohen-Boyer rDNA technology. *Industrial and Corporate Change*, 21(2), 249-275.
- Folta, T.B., Helfat, C.E., & Karim, S. (2016). Examining resource redeployment in multi-business firms. *Advances in Strategic Management*, 35, 1-17.
- Gancarczyk, M. (2016). The integrated resource-based and transaction cost approach to the growth process of firms. *Journal of Organizational Change Management*, 29(7), 1189-1216.
- Gao, G., & Hitt, L.M. (2012). Information technology and trademarks: Implications for product variety. *Management Science*, 58(6), 1211-1480.
- Ghoshal, S., & Nohri, N. (1993). Horses for courses: Organizational forms for multinational corporations. *Sloan Management Review*, 34, 23-23.
- Grant, R.M., Jammine, A.P., & Thomas, H. (1988). Diversity, diversification, and profitability among British manufacturing companies, 1972-84. *Academy of Management Journal*, 31(4), 771-801.
- Griffith, D.A., & Rubera, G. (2014). A cross-cultural investigation of new product strategies for technological and design innovations. *Journal of International Marketing*, 22(1), 5-20
- Grullon, G., Lyandres, E., & Zhdanov, A. (2012). Real options, volatility, and stock returns. *Journal of Finance*, 67(4), 1499-1537.
- Jensen, M.C., & Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Hashai, N. (2015). Within-industry diversification and firm performance—an S-shaped hypothesis. *Strategic Management Journal*, 36(9), 1378-1400.

- Accepted Article
- Helfat, C.E., & Eisenhardt, K.M. (2004). Inter-temporal economies of scope, organizational modularity, and the dynamics of diversification. *Strategic Management Journal*, 25(13), 1217–1232.
- Henderson, R., & Cockburn, I. (1996). Scale, scope, and spillovers: The determinants of research productivity in drug discovery. *RAND Journal of Economics*, 27(1), 32-59.
- Henkel, J. (2009). The risk-return paradox for strategic management: disentangling true and spurious effects. *Strategic Management Journal*, 30(3), 287-303.
- Henning-Thurau, T., & Houston, H.T. (2009). Conceptualizing and measuring the monetary value of brand extensions: The case of motion pictures. *Journal of Marketing*, 73(6), 167-183.
- Kogut, B., & Kulatilaka, N. (1994). Operating flexibility, global manufacturing, and the option value of a multinational network. *Management Science*, 40(1), 123–139.
- Lang, L., & Stulz, R.. (1994). Tobin's q, Corporate Diversification, and Firm Performance, *Journal of Political Economy*, 102 (6), 1248-1280.
- Levinthal, D.A., & Wu, B. (2010). Opportunity costs and non-scale free capabilities: Profit maximization, corporate scope, and profit margins. *Strategic Management Journal*, 31(7), 780–801.
- Lieberman, M.B., & Lee, G.K., Folta T. (2017). Entry, exit, and the potential for resource redeployment. *Strategic Management Journal*, 38(3), 526–544.
- Markides, C. (1992). Consequences of corporate refocusing: Ex ante evidence. *Academy of Management Journal*, 35(2), 398-412.
- Markides, C.C., & Williamson, P.J. (1994). Related diversification, core competences and corporate performance. *Strategic Management Journal*, 15, 149-165.
- Mitchell, M.F. (2000). The scope and organization of production: Firm dynamics over the learning curve. *RAND Journal of Economics*, 31(1), 180-206.
- Monga, A.B., & John, R.D. (2007). Cultural differences in brand extension evaluation: The influence of analytic versus holistic thinking. *Journal of Consumer Research*, 33(4), 529-536.
- Palich, L.E., Cardinal, L., & Miller, C.C. (2000). Curvilinearity in the diversification–performance linkage: An examination of over three decades of research. *Strategic Management Journal*, 21(2), 155–174.
- Priem, R.L. (2007). A consumer perspective on value creation. *Academy of Management Review*, 32(1), 219-235.
- Rawley, E. (2010). Diversification, coordination costs, and organizational rigidity: evidence from microdata. *Strategic Management Journal*, 31(8), 873-891.
- Rumelt, R.P. (1982). Diversification strategy and profitability. *Strategic Management Journal*, 3(4), 359–369.
- Sakhartov, A.V. (2018). Stock market undervaluation of resource redeployability. *Strategic Management Journal*, 39(4), 1059-1082.
- Sakhartov, A.V., & Folta, T.B. (2014). Resource relatedness, redeployability, and firm value. *Strategic Management Journal*, 35, 1781-1797.
- Sakhartov, A.V., & Folta, T.B. (2015). Getting beyond relatedness as a driver of corporate value. *Strategic Management Journal*, 36, 1939-1959.
- Sen, K.C. (1997). Advertising intensity within the carbonated soft drinks industry. *Journal of Advertising Research*, 37(3), 37-48.
- Shapiro, S., & Varian, H.L. (1998). Versioning: The smart way to sell information. *Harvard Business Review*, 6, 107-114.

- Sharp, B. (2010). *How Brands Grow: What Marketers Don't Know*. Oxford University Press. Australia and New Zealand.
- Shaver, J.M. (2006). A paradox of synergy: Contagion and capacity effects in mergers and acquisitions. *Academy of Management Review*, 31(4), 962–976.
- Silverman, B. (1999). Technological resources and the direction of corporate diversification. Towards an integration of resource-based view theory and transaction costs economics. *Management Science*, 45, 1109-1124.
- Stern, I., & Henderson, A.D. (2004). Within-business diversification in technology-intensive industries. *Strategic Management Journal*, 25(5), 487–505.
- Tanriverdi, H., & Lee, C.H. (2008). Within-industry diversification and firm performance in the presence of network externalities: Evidence from the software industry. *Academy of Management Journal*, 51(2), 381-397.
- Teece, D.J. (1982). Towards an economic theory of the multiproduct firm. *Journal of Economic Behavior & Organization*, 3(1), 39-63.
- Teece, D.J., Rumelt, R., Dosi, G., & Winter S.G. (1994) Understanding corporate coherence: Theory and evidence. *Journal of Economic Behavior & Organization*, 23(1), 1-30.
- The Wall Street Journal*. (2016). Soda taxes approved in four cities. Nov 9, 12.
- The Wall Street Journal*. (2017). Coca-Cola to replace Coke Zero in the U.S. Jul 26, 24.
- Thoma, G. (2009). Striving for a large market: Evidence from a general purpose technology in action. *Industrial and Corporate Change*, 18(1), 107-138.
- Treptow, E. (2017). Passport. *Journal of Business & Finance Librarianship*, 22(2), 166-169.
- Triantis, A.J., & Hodder, J.E. (1990). Valuing flexibility as a complex option. *Journal of Finance*, 45(2), 549–565.
- Vakratsas, D., Feinberg, F.M., Bass, F.M., & Kalyanaram, G. (2004). The shape of advertising response functions revisited: A model of dynamic probabilistic thresholds. *Marketing Science*, 23(1), 109-119.
- Villalonga, B. (2004a). Diversification discount or premium? New evidence from the business information tracking series. *Journal of Finance*, 59(2), 479-506.
- Villalonga, B. (2004b). Does diversification cause the "diversification discount"? *Financial Management*, 33(2), 5-27.
- Wernerfelt, B., & Montgomery, C.A. (1988). Tobin's Q and the importance of focus in firm performance. *American Economic Review*, 78(1), 246-250.
- Wiseman, R.M., & Bromiley, P. (1991). Risk-return associations: paradox or artifact? An empirically tested explanation. *Strategic Management Journal*, 12(3), 231–241.
- Wu, B. (2013). Opportunity costs, industry dynamics, and corporate diversification: Evidence from the cardiovascular medical device industry, 1976-2004. *Strategic Management Journal*, 34(11), 1265-1287.
- Ye, G., Priem, R.L., & Alshwer, A. (2012). Achieving demand-side synergy from strategic diversification: How combining mundane assets can leverage consumer utilities. *Organization Science*, 23, 207–224.
- Zahavi, T., & Lavie, D. (2013). Intra-industry diversification and firm performance. *Strategic Management Journal*, 34(8), 978–998.
- Zhou, Y.M. (2011). Synergy, coordination costs and diversification choices. *Strategic Management Journal*, 32 (6), 624–639.

**Table 1. Overall Sample**

		(1)	(2)	(3)	(4)
Industry		Company Sales	Number of Companies	Number of Diversified Companies	Number of Niches
	Mean	365.45	771.15	180.55	10
Body Care	SD	578.36	771.70	176.66	
	Mean	442.42	163.25	73.18	7
Consumer Electronics	SD	702.18	151.03	55.33	
	Mean	83.96	374.72	165.49	7
Drugs	SD	115.71	398.81	218.25	
	Mean	258.00	486.03	106.91	13
Home Appliances	SD	482.03	427.42	92.98	
	Mean	205.69	366.34	100.49	8
Homecare	SD	285.78	281.97	78.92	

Notes: Statistics are by year, niche, and country. Sales are in millions of Euros. Firms are diversified when they sell products in at least two different niches in the same year and country. Niche definitions are in the Appendix.

**Table 2. Variable Definitions**

	<b>Variables</b>	<b>Definition</b>	<b>Analysis</b>
	<b>Dependent</b>		
1	<i>Sales Growth</i>	Ratio of sales over two consecutive years ( $\text{Sales Growth} = \text{Sales}_t / \text{Sales}_{t-1}$ ) in a focal product niche – <i>analysis 1</i> (for a focal firm – <i>analysis 2</i> ). Values greater than 1 indicate sales growth; values less than 1 signal a sales decrease (Source: Euromonitor Passport).	1, 2
	<b>Independent</b>		
2	<i>Paired Niche Sales Growth</i>	Sales growth over two consecutive years of a product niche that appears in the same firm portfolio (Source: Euromonitor Passport).	1
3	<i>Dummy Scale Free Niches</i>	Variable that takes a value of 1 if, for two paired product niches matched, the firm uses the same brand (Source: Euromonitor Passport), 0 otherwise.	1
4	<i>Scale Free Niches</i>	Variable that counts the number of niches in the portfolio that use the same brand (Source: Euromonitor Passport).	1
5	<i>Non-Scale Free Niches</i>	Variable that counts the number of niches in a firm portfolio that are not linked by the same brand (Source: Euromonitor Passport).	1
6	<i>Scale Free Variance</i>	Standard deviation at time t of sales growth across all product niches linked by the same brand (Source: Euromonitor Passport).	2
7	<i>Non-Scale Free Variance</i>	Standard deviation at time t of sales growth across all product niches not linked by the same brand (Source: Euromonitor Passport).	2
	<b>Control</b>		
8	<i>Diversification</i>	Theil's entropy index, calculated for each company and year, from the share of sales in every niche occupied by the firm (Source: Euromonitor Passport).	1,2
9	<i>Competition</i>	Theil's entropy index for competitors' market shares (values closer to 0 indicate monopolies) in a niche (Source: Euromonitor Passport)	1,2
10	<i>Paired Niche Competition</i>	Theil's entropy index for competitors' market shares (values closer to 0 indicate monopolies) between two paired niches (Source: Euromonitor Passport).	1,2
11	<i>Niche Demand</i>	Level of total demand in a niche measured in total sales (million USD) (Source: Euromonitor Passport).	1,2
12	<i>Paired Niche Demand</i>	Level of total demand measured in total sales (million USD) between two paired niches (Source: Euromonitor Passport).	1,2
13	<i>Demand Difference</i>	Average difference in demand growth rates in paired niches, equal to $\text{Demand Difference} = (\text{Niche Demand}_{i,\Delta t} - \text{Paired Niche Demand}_{w,\Delta t}) / (\text{Niche Demand}_{i,\Delta t} + \text{Paired Niche Demand}_{j,\Delta t})$ (Source: Euromonitor Passport)	1,2
14	<i>Company Sales</i>	Sum of all niche sales in the company portfolio except for the niche that determines the dependent variable (Source: Euromonitor Passport).	1,2
15	<i>Versioning</i>	Number of product versions that a company sells within the same niche across countries provides a proxy for a versioning strategy (Source: Euromonitor Passport).	1,2
16	<i>Sector Variance</i>	Firm's weighted (firm sales per niche) standard deviation in sales growth generated by all competitors in a particular niche, except the focal firm (Source: Euromonitor Passport)	1,2
17	<i>Country Competition</i>	Theil's entropy index for competitors' market shares in an industry and country (Source: OECD).	1,2
18	<i>GDP</i>	Country's economic size (Source: OECD).	1,2
19	<i>Country FDI Inflows</i>	Economic internationalization according to foreign direct investment (Source: OECD).	1,2
20	<i>Country FDI Outflows</i>	Economic internationalization according to foreign direct investment (Source: OECD).	1,2
21	<i>Country Price Index</i>	Weighted average of prices of a basket of consumer goods and services at country level (Source: OECD).	1,2
22	<i>Consumption Expenditure</i>	Proxy for actual consumption in a country (Source: OECD).	1,2

**Table 3. Descriptive Statistics and Pairwise Correlations**

<i>a. Analysis 1: Niche based regression</i>											
<i>ID</i>	<i>Variable</i>	<i>Mean</i>	<i>S.D.</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
1	<i>Sales Growth</i>	1.012	0.143	1							
2	<i>Paired Niche Sales Growth</i>	1.02	0.264	0.092	1						
3	<i>Dummy Scale Free Niches</i>	0.217	0.412	0.003	-0.008	1					
4	<i>Scale Free Niches</i>	3.232	2.828	0.008	-0.007	0.529	1				
5	<i>Non-Scale Free Niches</i>	18.946	15.076	0.022	0.029	-0.47	-0.344	1			
6	<i>Diversification</i>	0.608	0.215	0.018	0.013	-0.165	0.064	0.484	1		
7	<i>Competition</i>	1.32	0.232	-0.014	-0.015	0.142	0.218	-0.207	-0.109	1	
8	<i>Paired Niche Competition</i>	1.321	0.238	-0.01	-0.011	0.131	0.231	-0.143	-0.09	0.231	1
9	<i>Niche Demand</i>	7.046	7.056	-0.013	-0.013	-0.107	-0.192	0.076	0.056	-0.005	-0.026
10	<i>Paired Niche Demand</i>	5.78	6.487	-0.012	-0.014	-0.034	-0.075	0.063	0.032	-0.001	-0.06
11	<i>Demand Difference</i>	-5.3	3259.021	0.001	-0.001	0.001	-0.001	-0.002	0	-0.003	0.003
12	<i>Company Sales</i>	443	606	-0.005	0.003	-0.138	0.043	0.452	0.292	-0.017	0.042
13	<i>Versioning</i>	4.173	4.340	-0.004	0.012	-0.286	-0.296	0.236	0.205	-0.008	-0.12
14	<i>Country Competition</i>	0.828	0.297	0.014	0.007	0.288	0.483	-0.149	-0.045	0.223	0.272
15	<i>GDP</i>	1911091	847589	0.074	0.049	0.055	0.128	-0.046	-0.028	0.023	0.007
16	<i>Country FDI Inflows</i>	26614	17895	0.009	0.002	-0.059	-0.093	0.125	0.077	-0.018	-0.036
17	<i>Country FDI Outflows</i>	41646	30383	0.031	0.023	-0.022	-0.04	0.044	0.021	0.023	0.019
18	<i>Country Price Index</i>	1.078	0.059	-0.093	-0.078	-0.062	-0.129	0.007	-0.013	0.068	0.081
19	<i>Consumption Expenditure</i>	983726	398501	0.073	0.045	0.026	0.078	-0.009	-0.01	0.017	0.002

	9	10	11	12	13	17	18
9 <i>Niche Demand</i>	1						
10 <i>Paired Niche Demand</i>	0.298	1					
11 <i>Demand Difference</i>	0.001	0.001	1				
12 <i>Company Sales</i>	0.311	0.269	0.001	1			
13 <i>Versioning</i>	0.369	0.034	0	0.21	1		
14 <i>Country Competition</i>	-0.533	-0.053	-0.006	0.043	-0.482		
15 <i>GDP</i>	0.002	0.005	0.003	0.012	-0.022		
16 <i>Country FDI Inflows</i>	0.308	0.262	0.003	0.26	0.139		
17 <i>Country FDI Outflows</i>	0.29	0.26	-0.001	0.234	0.062	1	
18 <i>Country Price Index</i>	0.291	0.279	0	0.189	-0.02	0.051	1
19 <i>Consumption Expenditure</i>	0.131	0.116	0.003	0.107	0.021	0.223	-0.336
<i>b. Analysis 2: Firm Based Regression</i>						<i>c.</i>	
	<i>Mean</i>	<i>SD</i>	<i>20</i>	<i>21</i>	<i>21</i>		
20 <i>Sales Growth</i>	1.088	1.909	1.000				
21 <i>Non-Scale Free Variance</i>	4.951	0.630	0.011	1.000			
22 <i>Scale Free Variance</i>	3.567	0.596	0.029	0.466	1.000		
23 <i>Scale Free Value</i>	0.009	0.064	0.097	0.004	0.026	1	
24 <i>Sector Variance</i>	0.159	0.510	-0.011	0.004	-0.007	-0.016	1
25 <i>Company Sales</i>	130.120	296.100	0.001	0.018	0.026	-0.050	0.369

**Table 4. Analysis 1 Results**

Variables	Models			
	(1)	(2)	(3)	(4)
<i>Paired Sales Growth</i>	0.0180 (0.00247)	0.0138 (0.00235)	0.0138 (0.00234)	0.0255 (0.00530)
<i>Paired Niche Sales Growth × Dummy Scale Free</i>		0.0231 (0.00705)	0.0232 (0.00705)	0.0145 (0.00799)
<i>Scale Free Niches</i>			0.00218 (0.00199)	0.00211 (0.00199)
<i>Non-Scale Free Niches</i>			0.000982 (0.000341)	0.00172 (0.000395)
<i>Sales Growth × Non-Scale Free Niches</i>				-0.000681 (0.000191)
<i>Dummy Scale Free Niches</i>	-0.000139 (0.00160)	-0.0235 (0.00728)	-0.0234 (0.00728)	-0.0146 (0.00821)
		<i>Controls inserted</i>		
Constant	2.037 (0.0372)	2.041 (0.0372)	2.012 (0.0381)	2.001 (0.0384)
Observations	115,841	115,841	115,841	115,841
R-squared	0.106	0.107	0.107	0.107

Notes: This table contains the results of a niche dyad OLS regression, with niche sales growth as the dependent variable. Robust standard errors are in parentheses, and the fixed effect (ID = 38,896 × time = 4) regression uses clustered errors by firm. The ID indicates the unique correspondence of the same brand–firm–niche–country, and time is in years. Number of firms = 386. The control variables are *Diversification*, *Competition*, *Paired Niche Competition*, *Niche Demand*, *Paired Niche Demand*, *Demand Difference*, *Company Sales*, *Versioning*, *Country Competition*, *GDP*, *Country FDI Inflows*, *Country FDI Outflows*, *Country Price Index*, and *Consumption Expenditure*.

**Table 5. Analysis 2 Results**

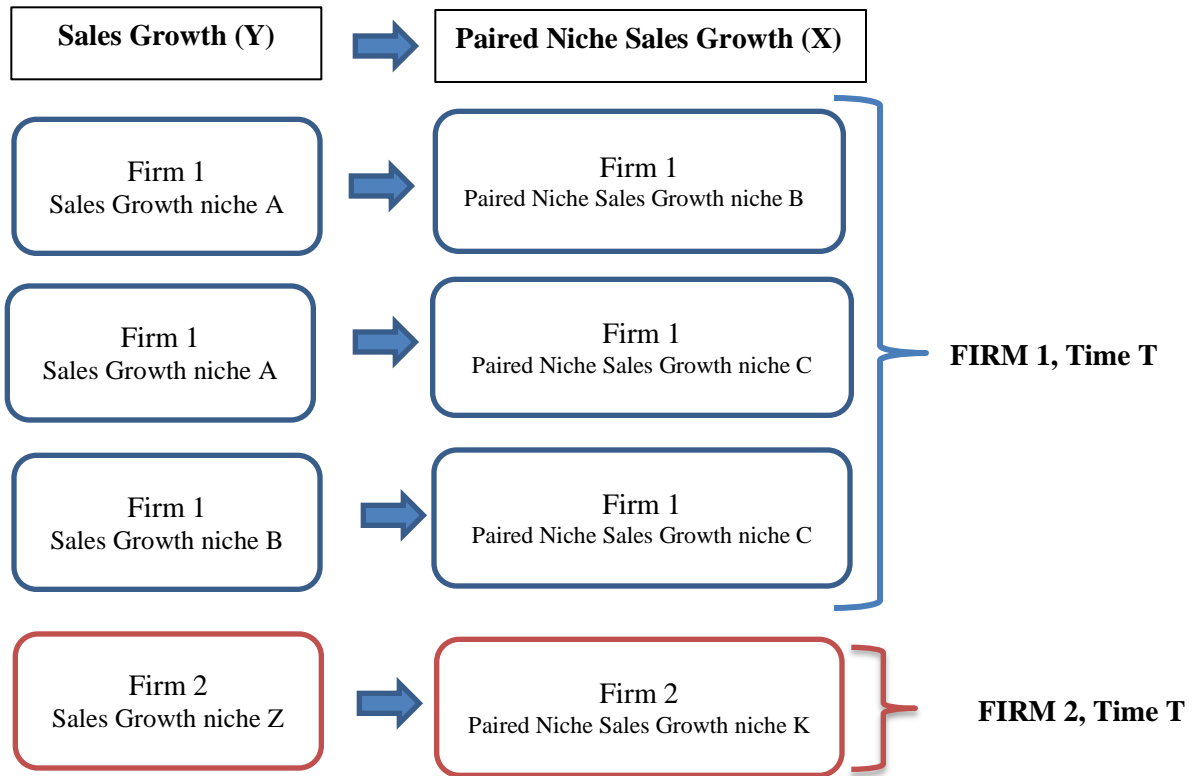
	Models					
	1	2	3	4	5	6
<i>Non-Scale Free Variance</i>		0.0261 (0.00659)	0.0225 (0.00828)	0.0140 (0.00713)	0.0140 (0.00720)	0.0141 (0.00738)
<i>Scale Free Variance</i>			0.00858 (0.0124)	-0.0103 (0.0125)	-0.0116 (0.0127)	-0.0123 (0.0127)
<i>Scale Free Value</i>				1.164 (0.166)	1.156 (0.166)	1.155 (0.165)
<i>Scale Free Variance * Scale Free Value</i>					-0.262 (0.158)	-0.315 (0.165)
<i>Non-Scale Free Variance * Scale Free Variance</i>						-0.0419 (0.0140)
<i>Sector Variance</i>	-0.0251 (0.0241)	-0.0265 (0.0244)	-0.0267 (0.0243)	-0.0273 (0.0229)	-0.0267 (0.0229)	-0.0268 (0.0229)
	<i>Controls inserted</i>					
<i>Constant</i>	2.563 (1.171)	2.601 (1.171)	2.588 (1.171)	3.549 (1.111)	3.536 (1.109)	3.522 (1.106)
Observations	2,283	2,283	2,283	2,283	2,283	2,283
R-squared	0.232	0.236	0.236	0.305	0.306	0.308

Notes: This table contains the results of a firm-based OLS regression, with firm sales growth as the dependent variable. Robust standard errors are in parentheses, and the fixed effect (ID = 815 × time = 4) regression uses clustered errors by firm. Results hold also when regression uses clustered errors by country-firm. The ID indicates a unique firm–country dyad, and time is in years. Number of firms = 386. The control variables are *Diversification*, *Competition*, *Paired Niche Competition*, *Niche Demand*, *Paired Niche Demand*, *Demand Difference*, *Company Sales*, *Versioning*, *Country Competition*, *GDP*, *Country FDI Inflows*, *Country FDI Outflows*, *Country Price Index*, *Consumption Expenditure*.

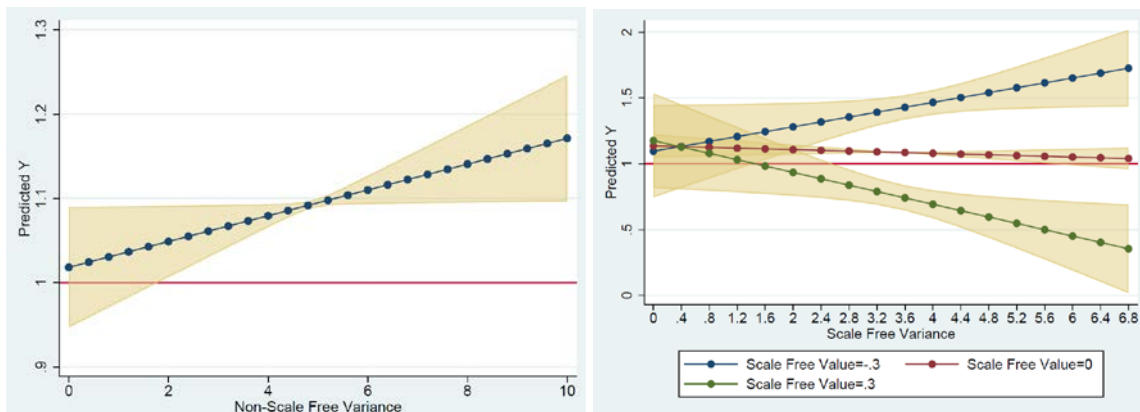
**Figure 1: Analysis 1 Regression**

**Firm 1 Product Portfolio** = {Product Niche A, Product Niche B, Product Niche C}

**Firm 2 Product Portfolio** = {Product Niche Z, Product Niche K}



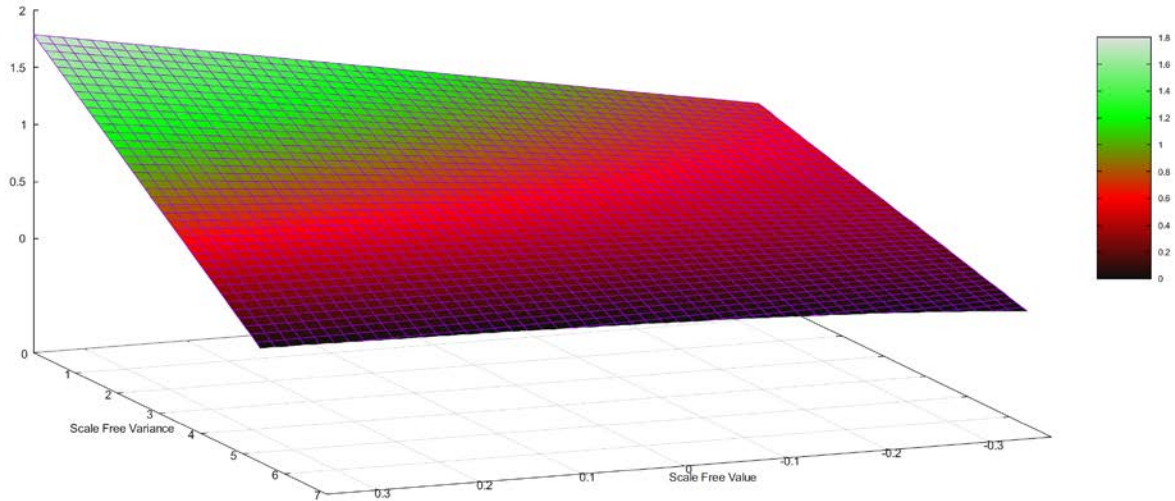
**Figure 2: Impact of Non-scale Free Variance on firm growth rate**



a) *Non-Scale Free Variance*

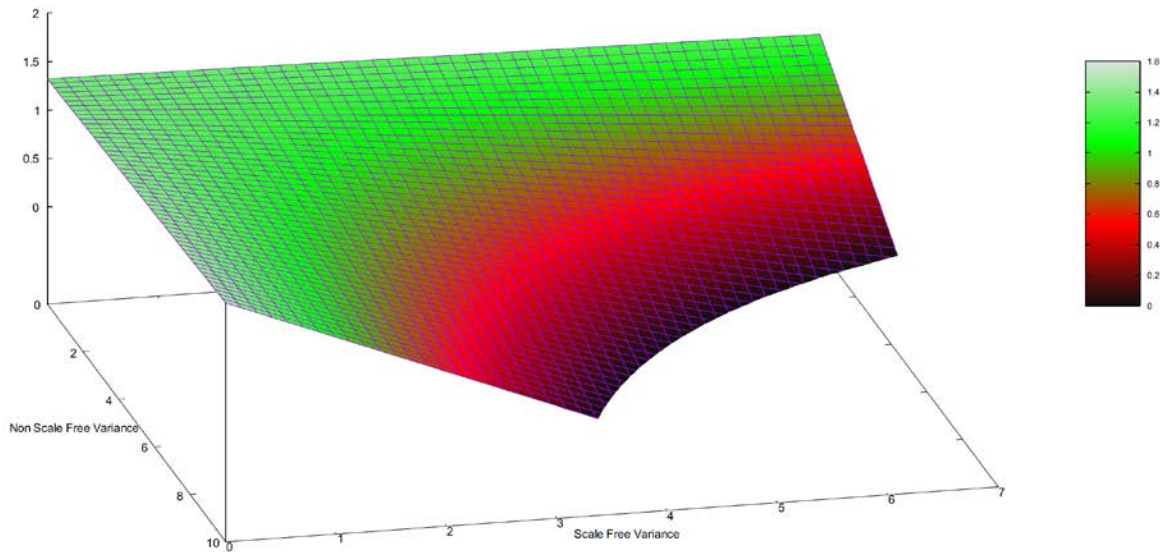
b) *Scale Free Variance*

**Figure 3: Monetary Effect of Scale Free Value and Scale Free Variance on Sales Growth**



[Note: Scale Free Value and Scale Free Variance represented from min to max value; z-axis represents Sales Growth; simulations representing the coefficients from the Table 5, Model 6; red line stands for zero growth rate, all other variables at their mean for a complete interpretation, consider that for Scale Free Value its 10<sup>th</sup> percentile is -0.059, while its 90<sup>th</sup> percentile is 0.072; for Scale Free Variance the 10<sup>th</sup> percentile is 2.91, while its 90<sup>th</sup> percentile is 4.13]

**Figure 4: Monetary Effect of Non-scale Free Variance and Scale Free Variance on Sales Growth**



[Note: Non-scale Free Variance and Scale Free Variance represented from min to max value; z-axis represents Sales Growth; simulations representing the coefficients from the Table 5, Model 6; red line stands for zero growth rate, all other variables at their mean; for a complete interpretation, consider that for Non-scale Free Variance its 10<sup>th</sup> percentile is 4.60, while its 90<sup>th</sup> percentile is 5.26; for Scale Free Variance the 10<sup>th</sup> percentile is 2.91, while its 90<sup>th</sup> percentile is 4.13]