Chapter 3
Project Management Office in the Nongovernmental Organization as a Driver of Sustainable Competitive Advantage: A Dynamic Capabilities Approach

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3.1 Introduction

Nongovernmental organizations (NGOs) generally develop their actions through projects in the fulfillment of their institutional missions (Lacruz and Cunha ahead of print; Diallo and Thuillier 2004). Some have found an alternative to improve project performance in the implementation of organizational units called the project management offices (PMOs) that achieve and sustain competitive advantage (Golini et al. 2014).

The historical trajectory of NGO formation—particularly in the context of Latin America—indicates the motivation for NGOs to adopt managerial practices inspired by for-profit organizations (Alvarez 2009; Silva 2010; Tenório 1999). Although its origin is attributed to a philanthropic model, the dynamism of its business environment, and consequent increase in competitive rivalry, encourages

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NGOs to migrate to a corporate model. For Alvarez (2009), this is called the "NGO-ization" of social movements.

Similar to the stock market, there is a donation market (Glaeser 2002) in which resources for the development of NGO projects are offered by public and private organizations. These are solicited by NGOs, usually by submitting project proposals in response to public policies' calls. As a consequence, more intense competition for resources exerts force for the professionalization of NGO management processes (Alvarez 2009; Silva 2010; Tenório 1999), such as the adoption of project management practices (Lacruz and Cunha ahead of print) in the search for greater efficiency, effectiveness, and transparency in their actions.

The dynamic capabilities approach points to the importance of incorporating the dynamism of the environment into the determination of competitive advantage. The way organizations react to the dynamism of the environment, whether through routines and processes (Teece 2007) or other capabilities (McKelvie and Davidsson 2009), allows organizations to reconfigure their capabilities, leading to new configurations and sustainable competitive advantage.

There is much literature demonstrating the positive influence of project management practices on project performance (e.g., Joslin and Müller 2015; Liu 2015) and, in the last decade, the analysis of the possible PMO moderating role in this context (e.g., Jalal and Koosha 2015; Dai and Wells 2004). However, a research gap remains, indicating the need for studies that adopt NGOs as an object of research and, especially, the analysis from the perspective of dynamic capability (Teece et al. 1997). These studies should have an analytical lens that may reveal new meanings to the role of the PMO in NGOs.

In addition, these studies approach the discussion using a transversal cut as a research strategy, which limits the disclosure of the possible role of PMO moderator, and markedly from observations in private for-profit organizations (e.g., Yazici 2009).

In response to the identification of this research gap in the literature, this study investigates the PMO's role in NGO internal project performance (triple restriction) under the lens of dynamic capabilities. It adopts a longitudinal cut (3 years) through an ex post facto research (Chapin 1947) using the difference-in-differences (DID) technique in a set of six projects of the same NGO operating in Brazil. Thus, the sample will be composed of four proportional groups, control group (1) before and (2) after the implantation of the PMO and treatment group (3) before and (4) after the PMO implantation, so that the evaluation of the impact of the possible role of moderating the PMO will be done by analyzing the double difference. Thus, the question of this research objectively presents itself: *is the performance of the projects in the period after the implementation of the PMO higher than in the period prior to implementation?*

3.2 Background

The perspective of dynamic capacities allows us to explain how organizations are renewed in response to environmental changes (Teece et al. 1997). Its conceptual structure, as emphasized by Augier and Teece (2008), is based mainly on the

combination of conceptual elements of resource-based view (Barney 1986; Penrose 1959), transaction cost economics (Williamson 1975, 1985), and the firm's neo-Schumpeterian view (Nelson and Winter 1982), which combine with the ideas of the innovation dynamics proposed by Schumpeter (1934, 1942).

The seminal concept of dynamic capabilities, in the initial definition proposed by Teece et al. (1997), refers to the organization's ability to integrate, construct, and reconfigure external and internal competencies in regard to the dynamism of the environment (Teece et al. 1997).

The concept of dynamic capabilities evolves on a varied basis. Although there is a relationship between these definitions, it is not uncommon for each author to emphasize one or more particular aspects of dynamic capabilities. In general terms, the definitions focus on the set of behaviors, abilities, and capabilities (e.g., McKelvie and Davidsson 2009), processes (e.g., Teece 2007), and organizational learning mechanisms (e.g., Crossan et al. 1999).

At the core of the concept of dynamic capabilities is the organization's ability to reconfigure its resources. This process will impact organizational performance. According to Winter (2003) and Zollo and Winter (2002), for a capability to be considered dynamic, the organization must be able to use it repeatedly and reliably. Thus, ad hoc solutions are not considered dynamic capabilities.

Also, for Teece (2007), dynamic capacity is the ability of the organization to identify environmental opportunities and threats, as well as respond efficiently to changes in the environment, from the adaptation/renewal and exploration of its internal and external competences, gaining lasting competitive advantage "... enterprise's capacity to successfully innovate and capture sufficient value to deliver superior long-term financial performance" (p. 1320). In this sense, not all the organizational responses given to environmental mutations, propelling threats and opportunities, can be considered manifestations of dynamic capabilities (Teece 2007), since some of them are not capable of improving the competitive performance of the organization.

Most NGO initiatives are conducted in the form of projects (Lacruz and Cunha ahead of print; Diallo and Thuillier 2004), which underscores their importance to these entities. As an effort to make managing their projects more effective (Pellegrinelli and Garagna 2009; Jalal and Koosha 2015), organizations have used the strategy of establishing and integrating a unit that is considered innovative and highly effective into their organizational structures (Alexandrova et al. 2015), typically known as PMO, present in the context of NGOs (Golini et al. 2014).

This study investigates the possible moderation exerted by PMO in the specific relationship between dynamic capabilities and project management performance. There is much literature demonstrating that project management has a positive influence on project performance (e.g., Joslin and Müller 2015; Liu 2015) and the PMO's moderating role in this context in the last 10 years (e.g., Jalal and Koosha 2015; Dai and Wells 2004). However, few reports have adopted NGOs as an object of research (e.g., Golini et al. 2014) and especially the analysis from the perspective of dynamic capabilities that has an analytical lens that can reveal new meanings to the eventual PMO's NGOs and for which empirical studies are rare (e.g., Biesenthal et al. 2012).

The motivation for NGO adoption of project management practices in general, and the implementation of PMOs in particular, stems in part from the dynamism of the historical trajectory of NGO formation, particularly in the context of Latin America (Alvarez 2009; Silva 2010; Tenório 1999). This has encouraged NGOs to migrate from a fundamentally philanthropic model to the corporate, titled by Alvarez (2009) as "NGO-ization" of social movements.

As a consequence, the corporate model brings together partnerships that trigger temporary organizational arrangements, in line with Turner and Muller's (2003) vision—of which projects are temporary organizations—to coordinate activities resulting from partnerships with business, government, foundations, and business associations and other NGOs (arising from the process of raising funds in the donation market). Thus, the more intense competition for public and private resources pushes NGOs to professionalize their processes and management models (Alvarez 2009; Silva 2010), adopting techniques and methods of project management (Lacruz and Cunha ahead of print) with the purpose of becoming competitive.

The PMO is usually seen as a center of excellence that implements practices and standardizes project-related governance processes, facilitating the sharing of resources, methodologies, tools, and techniques among the various projects (Project Management Institute [PMI] 2013). Its main objective is to improve project management effectiveness (Stanleigh 2006). The positive effects of PMO on project results and project portfolio management have already been demonstrated by several studies (e.g., Dai and Wells 2004; Desouza and Evaristo 2006; Unger et al. 2012).

There is no agreement on the typology of PMOs. Empirical research such as that of Hobbs and Aubry (2008) have demonstrated weaknesses in the definition of responsibilities and that PMO structures are the main reasons for the difficulty of standardizing and typing PMOs. According to the PMI (2013), PMOs should be classified according to their form of performance that varies in relation to the degree of control and influence they have in the organization. The PMO's functions can be support, functioning as a consultancy through the creation of templates, best practices, training, and lessons learned for other projects, and control, requiring compliance through the adoption of methodologies and the verification of compliance by the projects and the board, where the PMO takes control of the projects through the direct management of the projects.

Bates (1998) argues that the PMO has the support and leadership function. Block and Frame (1998) affirm that the PMO has the function of supporting projects by reducing administrative functions, consulting, guidance, developing standards and methods, and training and support to project teams. Kwak and Dai (2000) understand that the PMO's role depends on the size of the organization and adds the development of historical project data and human resource assistance to PMO functions.

The variety of responsibilities and functions of PMOs shows that the scope of their work is unclear and their characteristics depend on factors such as organizational characteristics (Hobbs and Aubry 2008), specific organizational requirements (Bates 1998), organizational objectives (Kwak and Dai 2000), and the portfolio of projects in the organization (Cooper et al. 1997). Other researches (Aubry et al. 2010; Hurt and Thomas 2009) analyze the frequent transformation

of the PMO and its patterns of change, due to the change in said factors. Cooper et al. (1997) argue that as the list of active projects in the organization (portfolio) is regularly updated, it makes PMO's portfolio management a dynamic process, thus requiring dynamic capabilities.

Dynamic capabilities[1] are made up of three main capacities: (1) to sense and shape opportunities and threats, (2) to seize opportunities, and (3) to maintain competitiveness by improving, combining, protecting, and, if necessary, transforming and reconfiguring of the organization's intangible and tangible assets (Teece 2009).

In this context, PMOs are transforming organizational units where their roles and functions evolve on a continuum in relation to environmental change. Petit and Hobbs (2010) understand that the organization's project governance is shrouded in routine as governance is systematic over time. Regular changes in the project portfolio, for example, generate new needs and opportunities (sensing) that make organizations, through PMOs, develop dynamic capabilities by adapting to changing needs and opportunities (transforming and reconfiguring) (Teece 2009).

Adapting to changes in the project portfolio involves a combination of organizational structures, processes, and people involved in the seizing process (Killen et al. 2008). Project portfolio management involves a number of decision-making bodies and rules that are usually defined in the governance structure of the entity. In practice, the entity may need to reconfigure and reallocate existing resources and potentially develop new resources, which involves changing the enterprise's routines (Petit and Hobbs 2010).

According to Petit and Hobbs (2010), project, portfolio, and program governance, which is a function of PMOs, has a dynamic ability to perceive opportunities and threats, seize opportunities, and maintain competitive conditions by enhancing, combining, protecting, and even reconfiguring business assets.

Killen et al. (2008) further argue that establishing a holistic view on decision protocol selection is also part of the routine of PMOs, aligning with organizational strategies and delivering the best results, as well as learning activities and organizational skills that ensure the dynamism and responsiveness to the changing environment, which denotes its dynamic capacity. In this context, according to Petit and Hobbs (2010), the selection of decision-making protocols refers to decision-making by project managers and committees, who are created to manage and decide on the different components of the portfolio.

Thus, the PMO can be considered an organizational unit with transformative aptitude focused on projects, capable of providing organizations that use projects as a way of operating their strategies, particularly NGOs, with dynamic capabilities. The following research hypothesis follows: *H1, the PMO positively impacts the internal performance of the projects.*

[1] According to Teece (2009, pp. 87–88) "The particular (nonimitability) capacity business enterprises possess to shape, reshape, configure, and reconfigure assets only to respond to changing technologies and markets and escape the zeroprofit condition. Dynamic capabilities relate to the enterprise's ability to sense, seize, and adapt in order to generate and exploit internal and external enterprise-specific competences, and to address the enterprise's changing environment."

3.3 Method and Empirical Context

This study shows the potential impact of PMO on the performance of NGO projects, through an ex post facto study (Chapin 1947), using the DID technique through multiple linear regression (Ashenfelter and Card 1985) in a set of six projects of the Brazilian environmental NGO Instituto Terra (http://www.institutoterra.org/).

In the context of this study, ex post facto researches are appropriate in the analysis of natural experiments (Chapin 1947) and the evaluation of the possible impact of the implementation of PMO (exogenous event) on the performance of projects (variable explained). The DID technique, in turn, is appropriate in the analysis of control and treatment of groups in natural experiments, since it aims to isolate the impact of the exogenous event by the double difference (Ashenfelter and Card 1985). This means to extract the "pure" effect of the natural experiment on the dependent variable, ceteris paribus. Mathematically the DID method can be represented with the following equation:

$$\delta = \left(y_{T1} - y_{C1}\right) - \left(y_{T0} - y_{C0}\right)$$

Being:

δ = estimate from the difference in differences
y = mean of outcome of interest for each period and group
T and C = treatment group and control group
1 and 0 = period after and before treatment

The DID technique uses two subtractions: the first refers to the difference between the means of the variable outcome between the treatment and control groups for the periods before and after treatment, and the second refers to the difference of the initially calculated differences. This is the origin of the term difference in differences. Thus, δ is the estimate of the impact of the natural experiment on the variable to be explained. In order to make the DID technique clearer, an analytical scheme is shown in Fig. 3.1.

The main assumption of this technique is that the temporary course of the variable outcome for the control group represents what would occur with the treatment group if it had not been exposed to the exogenous event. This assumption usually cannot be verified directly in the data, but an indication of its validity appears when the trajectories of the two groups are similar in the period previous to the observed event. The essential concept is that if the trajectories resemble each other during the period before treatment, then it seems acceptable to think that the evolution of the control group after the event represents what would happen to the treatment group in the nontreatment situation in a permissible way.

In Fig. 3.2 the research project is illustrated from the classic notation system of Campbell and Stanley (1979).

The data for our study were collected in quarterly performance reports of 6 projects over 3 years, thus totaling 36 observations. The projects were classified into

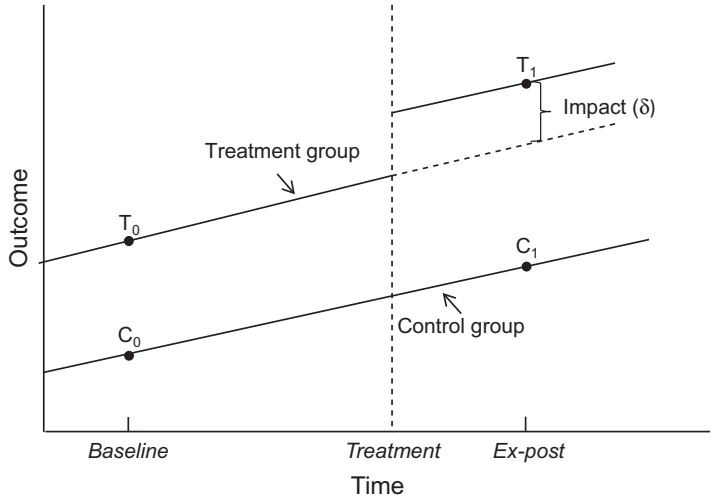

Fig. 3.1 Difference in differences

Fig. 3.2 Research project. (*Note.* X: exposure to an experimental event. O: measurement record. ___: temporal order. _____: groups not equivalent by random designation)

four proportional groups: control group before and after the implementation of the PMO and the treatment group before and after the implementation of the PMO. This was done in order to evaluate the possible impact of the PMO by the analysis of the double difference.

It is added that the Project Performance Indicator (PPI) was used as a proxy for project performance quality, composed of the simple arithmetic mean of the performance indicators in cost, time, and scope. The PPI is an index number that varies from 0 to 1, and the higher the PPI, the better the project performance. The DID method was implemented using multiple linear regression, processed in software R version 3.3.3 (R Development Core Team 2017). Its mathematical representation can be expressed as follows:

$$y = \beta_0 + \beta_1 dG + \beta_2 dT + \delta\left(dG.dT\right) + \mu$$

Being:

dG = dummy variable for the groups (control and treatment)
dT = dummy variable for the time (before and after treatment)
$dG.dT$ = interaction term
δ = coefficient of interest

The choice of Instituto Terra as an object of study is justified by three main reasons: (1) it develops a large part of its actions through projects, for which it obtains resources in the donation market (Glaeser 2002); (2) it has a relationship with a diverse set of donors from various segments of society, such as government agencies, business foundations, private companies, and other NGOs, both national and international; and finally, (3) it is pioneering in the context of the third Brazilian sector, in the implementation of a corporate PMO.

Instituto Terra was founded in 1998 and focuses its activities in the region of the Brazilian Atlantic Forest. It is currently among the largest environmental NGOs in Brazil (Análise Gestão Ambiental, 2015) and has received worldwide recognition for its work on the protection of springs (Gazeta online 2016).

Before the implantation of the PMO, the organizational structure of Instituto Terra could be characterized as functional. After implantation, as matrix, its PMO nucleated at the tactical level, lateral to the other departments (business units divided according to the areas of activity of the entity), with reporting line to the main executive of the entity. The organization's organizational design has thus combined an integrated functional structure with departmental criteria for temporary project units (covenant period).

The implementation of the PMO began in 2009 after reviewing the entity's strategic planning. The PMO was designed as a guiding unit with the following functions:

- Development, implementation, and support of methodology and project management software
- Preparation of project proposals to be submitted to potential donors
- Control of projects and definition and monitoring of performance indicators
- Development of operational process assets (e.g., workflow)
- Sharing of performance reports and documents
- Program and portfolio management

Especially since 2014 Instituto Terra has been systematically expanding the scope of its main project, called Olhos d'Água (Leitão 2016). This expansion has led Instituto Terra to have remote teams in several municipalities in the states of Minas Gerais and Espírito Santo, where the project is concentrated. The role of the PMO in this process of expansion of this project (still in progress) was absolutely important, as reported by the former Executive Director of Instituto Terra, who was responsible for implementing the project management methodology (Lacruz 2014) and the PMO (Lacruz 2015) in the entity. According to him it was necessary, considering the relationship with various donors of different sizes, legal natures, and nationalities, to establish partnerships with different stakeholders. Working with remote teams and, due to the geographic scope of the project, developing common operational protocols and making a virtual and integrated management of all areas of the project were also necessary. Additionally, establishing a road map with guidelines for defining the speed and geographical limits of each stage of the process of project expansion is also important.

Table 3.1 Global performance indicator by group and period

	Control group		Treatment group	
Descriptive statistics	Before treatment	After treatment	Before treatment	After treatment
Mean	0.81	0.77	0.79	0.93
Minimum	0.76	0.72	0.74	0.87
Maximum	0.83	0.81	0.84	0.97
Standard deviation	0.04	0.05	0.05	0.05

All this reveals the relevance of the PMO of the Instituto Terra as an object of study. The following is an analysis of the possible impact of the PMO on project performance.

3.4 Findings and Discussion

Before starting the DID procedures, the studied variable was characterized in order to broaden the understanding of the results (Table 3.1).

The examination of Table 3.1 reveals that the projects that make up the control group have, on average, lower overall performance than those that make up the treatment group after PMO implantation and greater dispersion of data (coefficient of variation of 6.5% and 5.4%, respectively). It also shows that before the PMO implantation, their averages were higher, and there was less dispersion (coefficient of variation of 4.9% and 6.3%, respectively).

As it was pointed out, the main assumption of the DID technique is that the trajectories of the two groups are similar in the period before the treatment. It can then be assumed that the temporary course of the outcome variable for the control group represents what would occur with the treatment group if they had not been exposed to treatment. In this thread, it was verified by the one-way ANOVA test that the hypothesis of equality between the treatment and control groups before the PMO implantation could not be rejected (p-value = 0.382). This finding provided support for the DID technique (see "Appendix").

The model used to verify the possible impact of the PMO on the performance of the projects through the DID technique was the multiple linear regression. The variable was the PPI, which is an index number that varies from 0 to 1. The closer the variable is to 1, the better the performance of the project will be.

In order to process the regression, dummy variables were created for the period before (0) and after (1) the implementation of the PMO (time_dummy) and for the control (0) and treatment groups (1) (groups_dummy). The other variable created was the interaction term (Mod) by the product of the two dummies.

The coefficient for the Mod variable, which is an estimate of the difference in differences, was statistically significant (p-value = 4.96e−07) and had positive impact (β = 0.173) of the PMO implementation in the project performance

(see "Appendix"). So, there is evidence to refute the null hypothesis that the internal performance of the projects after the PMO implementation has not been higher than the period before its implementation.

Thus, the positive impact of the PMO on the performance of projects of the NGO under study is shown in the period considered. This study argues that PMO can be considered as an organizational unit, focused on projects, with characteristics that allow it to operate as a driver in obtaining a sustainable competitive advantage, since it has the capacity to transform project management capabilities into dynamic capabilities, to identify and/or create opportunities, as well as to mitigate and/or eliminate critical threats, providing superior performance to the organization.

Capabilities can become dynamic for two main reasons, particularly the PMO of the NGO under study (remembering that different PMOs may have different roles and functions) when compared to the characteristics of the dynamic capacities. First, the development and deployment of routines arise for the selection of decision-making protocols. This understanding converges with the understanding of Petit and Hobbs (2010), for whom the selection of decision protocols (which are part of PMO functions), aligning with organizational strategies as well as organizational learning activities, contributes to the dynamism and responsiveness to the changing environment. It is also aligned with Biesenthal et al. (2012), when they propose that dynamic capacities are used at various project levels to reconfigure the existing project management capabilities. At the same time, the findings of this project complement these studies, as it comes from the PMO impact assessment on objective project performance metrics.

It is important to point out that the PMO, the object of this analysis, was devoted to a set of non-exhaustive organizational functions that enabled better elaborated decision-making mechanisms through a centralized and coordinated vision offering an environment of greater adaptability and dynamism in the individual actions of each project and in the inter-project relations. It is pertinent to expect that the addition of new functions to the PMO can further amplify its effects on project performance and, consequently, on the competitiveness of the studied NGOs.

It is suggested that, by focusing project management on a dedicated organizational unit, it is possible to establish a holistic view on the selection of decision protocols (Killen et al. 2008) to respond to environmental changes more quickly and flexibly, leading the projects to better levels of performance.

The proposed analytical framework suggests that PMO contributions to internal project performance may be associated with processes that are used in multiple projects. PMOs tend to provide organizations with past experience, allowing organizations to transfer knowledge from one project to another, replicating successful actions and seeking alternatives to unsuccessful actions, by developing historical data from past projects and, in accordance with the proposals of Kwak and Dai (2000) and Julian (2008), gaining a sustainable competitive advantage through organizational learning (Crossan et al. 1999).

Thus, it is argued that the PMO contributed to the NGO being able to perceive opportunities and threats (sense), avail opportunities (seize), and maintain competitive conditions for the continuous improvement of business assets

(transforming and reconfiguring). Therefore, it does not constitute itself in a dynamic capacity, recognizing that it is assumed as an internal strategic resource of the entity (Lacruz and Cunha ahead of print) or that its functions are dynamic capacities. This contrasts with the argument of Petit and Hobbs (2010) and Biesenthal et al. (2012) that says their functions empower project management capabilities to become dynamic capabilities.

In this sense, the PMO can be understood as a resource capable of providing the organization with dynamic capabilities, a source of sustainable competitive advantage for the studied NGO.

3.5 Conclusions

A project considered as a temporary effort to create a unique product or service has unique characteristics, challenges, and requirements. Unlike managing production processes, as each project is unique, organizations need to adapt their capabilities according to the nature and specificity of each project. Additionally, for many organizations, including NGOs, managing multiple projects simultaneously requires a considerable effort that often fails to achieve performance results in cost, time, or scope.

Although a wide range of studies uses the theoretical underpinnings of dynamic capabilities, there is a lack of studies involving their relationship with project management, especially in the context of NGOs. Consequently, this study contributes to a better understanding of dynamic capacities in NGO's project management. The idea that is here presented is that PMOs in NGOs act as catalysts of dynamic capabilities enabling such organizations to achieve higher levels of performance in their projects. This argument was supported by the application of the DID method to a Brazilian NGO, in which a significant improvement in project performance was observed after the implementation of the PMO.

The practical implications of such findings involve understanding the role of the project office as a catalyst for dynamic NGO capabilities, targeting such organizations to design their project offices in order to capture, store, develop, and share the knowledge generated in each project so that the dynamic capabilities can be properly harnessed for the superior performance results of their projects.

As a theoretical contribution, this study extends the scope of the PMO as a facilitator of organizational learning through the management of projects and the development of dynamic capabilities to meet the specificities of each project and context.

However, caution should be exercised in interpreting the results, since in ex post facto studies what is generally obtained is the existence of a relationship between variables, without being able to ensure the cause-effect relationship (McMillan and Schumacher 2006). On the other hand, the results suggest relationships that can be used in future studies that have access to data from a larger number of NGOs, and of a greater temporal scope, that have implanted the PMO in their organizational structures.

Further research can also be performed using other performance metrics such as beneficiary or donor satisfaction. In addition, it would be pertinent to examine the possible differences between NGOs of different sizes, sectors of activity, and regions, whose culture and economic conjecture are different.

Appendix

Outputs – Software R

One-way ANOVA

Table Appendix – ANOVA

	Df	Sum Sq	Mean Sq	F value	Pr (>F)
Groups_Before_dummy	1	0.00125	0.00125	0.806	0.382
Residuals	16	0.02480	0.00155		

Difference-in-Differences – Multiple Linear Regression

Table Appendix – DID

Residuals				
Min	1Q	Median	3Q	Max
−0.06000	−0.04750	0.01833	0.02667	0.05000

Coefficients				
	Estimate	Std. error	t value	Pr (>|t|)
(Intercept)	0.80667	0.01382	58.373	< 2e-16 ***
Time_dummy	−0.03333	0.01954	−1.706	0.0978 .
Groups_dummy	−0.01667	0.01954	−0.853	0.4001
Mod	0.17333	0.02764	6.271	4.96e–07 ***

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
Residual standard error: 0.04146 on 32 degrees of freedom
Multiple R-squared: 0.714; adjusted R-squared, 0.6872
F-statistic: 26.63 on 3 and 32 DF; *p*-value, 7.916e-09

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