FWU Journal of Social Sciences, Spring 2022, Vol. 16, No.1, 47-68
DOI: *http://doi.org/10.51709/19951272/Spring2022/4*

Effects of Clusters and Business Environment Context on Knowledge Absorption Capacity and Measurement with A Panel Analysis

Durmus Cagri Yildirim and Korhan Arun
Namık Kemal Mahallesi Kampüs, University, Süleymanpaşa, Turkey

The theoretical hypotheses of absorptive capacity (AC) are relatively simple; validation and measurement are more complicated. There are still discussions about AC's best proxy or measurement because archival or survey methods may not provide dependable results. Additionally, absorption theories have not researched the effectiveness of a spatial or geographically relevant bounding as a cluster. Exterior factors define absorptive capacities, but their contingent effects on variables and forms are unclear. Limited studies on the external networks and business environment and change in theory versus execution remain essential research subjects. This research aims to explore the effects of clusters and the business environment on absorptive capacity from the perspective of contingency theory. Based on a sample of 38 nations, World Bank, and Global Innovation Index within the 2013-2018 period data, panel analysis shows that cluster inclusion and business environment relative to the nation can strengthen the absorptive capacity. The results also show that the proxy variable of absorptive capacity is significantly related to results.

***Keywords*:** Absorptive capacity, Clusters, Business Environment, Panel Data Analysis.
Jel Codes: D83, I.14, Q51, C23

Firms need external knowledge to be innovative. However, external knowledge is different from know-how. Moreover, there are various knowledge resources and an infinite amount of external knowledge. So, it is hard to search and detect practical knowledge from outside the firm. Another aspect of practical knowledge is the degree of absorption in the firms. Firms can not decide whether the knowledge is helpful unless external adaptation turns to internal integration or absorption. Exploitation and commercialization, building external knowledge, and pursuing business-driven knowledge are affected by various reasons. Thus, it is still important to study the key factors that affect these reasons. Clusters are one form of knowledge resource, and the business environment is relevant to quantifying the knowledge. Hence, this paper researches the operationalization of absorptive capacity (AC) using an instrument to

Correspondence concerning this article should be addressed to Dr. Korhan Arun, Associate Professor, Namık Kemal Mahallesi Kampüs Cd. No:1 Süleymanpaşa /TEKİRDAG/TURKEY, Email: karun@nku.edu.tr

obtain scores from variables related to collaborating ways with external partners because AC is a collaborative, inter-organizational endeavor.

The Problem of External Knowledge Absorption for organizations is absorption process from external networks can be working on fundamentally different terms (Williander, 2007). Although the concept of AC is related to the environment response (Arun & Yıldırım, 2017; Rojo et al., 2016), previous articles studying the relationship between the environment and AC are limited (Kim et al., 2013). Both formal and informal modes of advanced interaction with external knowledge resources have been built on the critical blocks of most industrial innovation without seriously understanding how. So, in the literature, the real impact of national contexts at the organizational level of AC is still unclear (Gaur et al., 2019).

Moreover, the literature has not considered the systematic casual effects of underlying mechanisms and research on absorbent capacity between firms, especially from the macro inter-organizational level perspective (Newey & Verreynne, 2011; Van Wijk et al., 2007). AC is not static, but it is a process or ability that AC should be researched within the non-R&D contexts to understand its various dimensions' complexities (Lane et al., 2006). That is why the business environment and markets are important contexts that may affect AC directly. The expression of the related companies may well be operating in different but complementary activities is misleading. Many organizations partly belong to different markets or business environments (Hamdouch, 2010) or are distributed spatially unevenly (Jiří et al., 2017). How organizations can harness the value of new external information and process it through outcomes may seem like an important research topic of absorptive capacity theory (Butler & Ferlie, 2019; Cohen & Levinthal, 1990; Pi et al., 2018). However, measuring absorptive capacity and defining proxy variables are difficult but studying the innovation and absorptive capacity relationships is more problematic because of the heterogeneity of the external context. In common, R&D and/or human capital measurements are used for measuring AC proxies (Cassiman & Veugelers, 2006; Harris & Yan, 2019; Moilanen et al., 2014; Spanos & Voudouris, 2009) even though neither measurement can be fully indicator of its designator (Flatten et al., 2011; Lane et al., 2006) especially when measuring at the macro level. This paper attempts to identify some of the measurement variables and effectiveness of absorptive capacity, focusing on the relationships between environment, networks, and country context.

Absorbing the new external knowledge depends on the recipient and the process of knowledge transfer between the organization and its environment (Zhao & Anand, 2009; Li et al., 2014; Reiche, 2011). Absorptive capacity depends on multidimensional facets and has different subsets. As a source of absorptive capacity, organizations have

exterior, process, and individual levels (Matusik & Heeley, 2005; Zou et al., 2019). Beating around the bush, absorption capacity researchers tried to measure recognizing the value of new exterior knowledge without considering the conditions of the external environment (Bradford & Saad, 2014). At the macro-organizational level, one of these dimensions of assimilating knowledge is based on dyad characteristics or networks. Absorbing and transferring knowledge have been built by maintaining a diversity of network ties (Tepic et al., 2012), in which organizations' capacity to receive external knowledge (Kang & Kang, 2014; Zahra & George, 2002). In other words, organizations need to know where the sources of information are.

Matusik and Heeley (2005) related the external environment to high network relations. Infrastructure, services, and management optimization can only be achieved after a certain level of clustering, leading to technological progress and human capital improvement. Some of these developed clusters rely on their advantages along with the horizontal adsorption of the surrounding region (Liu, 2010). Clusters thus appear as a source of superficial knowledge depending on relations in the equivalent cognitive environments between organizations at the interchangeable location and other distant organizations (Giuliani et al., 2019). However, from an economics perspective, the knowledge flow is regional-specific and related to the spatial level of correlations (Li et al., 2020). The manufacturing and export numbers will decrease in the West because of the competition from the East. So, to understand the relationships between organizations and the environment, we need to analyze the conditions and particular directions in the environment and do an inter-organizational network relation in developed countries (Goes & Park, 1997; Hatch & Cunliffe, 2013).

As cluster theory reflects the big picture, connected entities in the relationships can differ surprisingly (Latour, 2005). The extent of joint development supports an inverted U-shaped impact on performance and absorption (Pi et al., 2018). Here, there are strong institutional and inter-organizational links between interdependent actors that define the value of the network. However, the links envisaged are only formal but informal interactions between organizational or state factors (Hamdouch, 2010). Absorption in the clusters also depends on how organizations are aligned with local environmental conditions given the context of the public business environment occurring at the business level. The environment in which the cluster is embedded affects the contextual conditions of an industrial cluster emphasize (Mueller & Jungwirth, 2016). The business environment employs 'ease of starting a business and 'ease of closing a business' (Cost of redundancy dismissal) (Gannon & Pillai, 2013; Yadav & Chaudhari, 2018). Consequently, these factors, which have never been researched quantitatively at macro levels, are significantly related to clustering effectiveness and absorptive capacity as a natural result.

Although highly-developed clusters have been attracted attention recently, no quantitative papers have studied clusters from an international perspective as whole or consequences from an absorptive capacity perspective. (Mueller & Jungwirth, 2016). The effectiveness of industrial clusters, including knowledge flow, depends on the clusters' context, structure, and functioning mechanisms, e.g., funding authorities' ease of starting a business. Developments in the spheres of culture and business can partly be understood in terms of arguments that are essentially variations of the notion of the clusters. Even though many researchers have studied AC as an important concept and have been cited in numerous research in related fields, they do not have a standard conceptualization and measurement method (Pi et al., 2018). So, in this paper, the main research question is to find out the effects of cost of redundancy dismissal, ease of starting a business, and cluster development variables on knowledge absorption of organizations with macro quantitative analysis. Staying on the ball, specifically, we examined three dimensions that comprise the absorptive capacity construct: (a) measurement of knowledge spillovers with a new variable set at the national level of these variables related to each nation, (b) cluster approach to external knowledge, and (c) business environment accordingly with the nation.

Another reason why it is valuable to look at a country comparison between developed economies is that there could be a difference in theory versus what occurs on the ground in these countries.

Clusters and Absorptive Capacity

A firm's absorptive capacity is positively related to its knowledge (Zou et al., 2018). However, this transfer depends on market and industry sources (e.g., industry, other competitors, and suppliers)(Murovec & Prodan, 2009), density, and diversity of relations (Moreira et al., 2018), or coordination (Moreira et al., 2018). Relation to these factors needs a network of indirect interaction such that most of its members are interlinked, at least through a third party, who is also one of the most critical aspects of clusters (Sedita et al., 2020). Additionally, the primary function of AC is seeking and identifying valuable external knowledge, absorptive effort (Todorova & Durisin, 2007), which concerns a knowledge-building portfolio that enables the organization to search, identify, and acquire external knowledge (Arun & Kahraman Gedik, 2020; Song et al., 2018). Especially, small and medium-sized enterprises SMEs need knowledge networks or clusters for innovation (Rodríguez et al., 2020). Naturally, clusters ease the knowledge spillovers to diffuse in space more effectively because clusters increase the firm knowledge base. The knowledge base is vital in the absorptive effort, so in AC, development is cumulative and path-dependent related to clustering characteristics. The main idea behind the cluster formation is that valuable knowledge would become like public good for the income of the organizations. In other words, knowledge spillovers, intellectual capital, input sharing as proxies can be helpful to explain the success of organizations in clusters (Chain et al., 2019). However, absorbing maximum knowledge

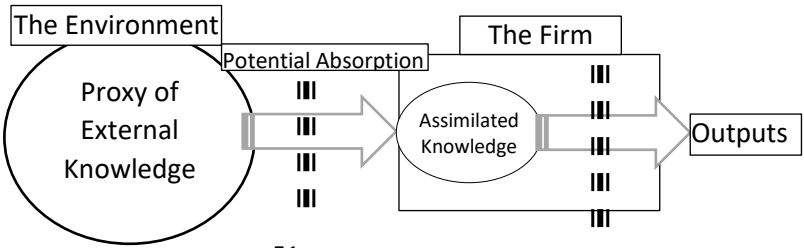
in collaborative networks is still related to the collaboration exchange process between partners (Movahedian-Attar, 2016).

Consequently, firms get unequal advantages from being located in a cluster, but even if it is generally related to homogeneity between firms located within clusters, whether firms can gain or lose from the co-location in similar industries depends on a variable like ACs (Grashof et al., 2020; Šarić, 2012). Aoki and Takizawa (2002) showed that if organizations are seeking technical advantage and willing to absorb dominant technological developments, they will seek to connect over the network involved during the production under this system. However, the opposite idea also asserted that knowledge transfer within firms is more critical than inter-firm relations (van Wijk et al., 2008).

Even though some researchers explained cluster and absorptive capacity relations, they explained the value-adding process and positive factors or namely network dynamics in clusters that affects knowledge absorption (Belso-Martínez et al., 2016; Bocquet & Mothe, 2010; Chandrashekar & Mungila Hillemane, 2018; Grandinetti, 2016; Pan et al., 2019; Pérez Hernández et al., 2017). Network dynamics depend on firms' relational capability, which positively impacts the AC because the firms' network has an important factor in accessing external knowledge and gaining exterior support to strengthen the AC (Zou et al., 2018). Supporting these authors, Ganesan et al. (2005) found that the absorption typically ascribed to close geographical proximity may be attributed to strong relational ties. In other words, even if the firms benefit from geographical closeness, they need the benefits of cluster membership.

Zahra and George (2002) divided the absorption process into two subprocesses. Potential absorptive capacity includes knowledge acquisition, which mainly focuses on knowledge exploration from the environment (Fig 1) (Zou, Guo, & Guo, 2019). Acquisition refers to "a firm's capability to identify relevant external information over the total amount of information surrounding the firm" (Du et al., 2015). However, later some authors argued a four-factor model in which acquisition, assimilation, transformation, and exploitation are separate dimensions. They had a better capture knowledge absorption capacity (Flatten et al., 2011; Jansen et al., 2005).

Figure 1: From external knowledge to outcomes (Fosfuri & Tribo, 2008)



International ecosystems have a more competitive environment than the regional or national cluster (Rinkinen & Harmaakorpi, 2018). In an international, rather than regional or small, ecosystem, the accumulation of knowledge-knowledge absorption- is critical to cluster formation (Botelho & Bastos, 2010). From the organization's viewpoint, organizations absorb knowledge from the environment to produce output (Hatch & Cunliffe, 2013). Nevertheless, since such studies often use citations to measure knowledge transfer or the type of innovation pursued, using non-survey data is confusing at the organizational level (Van Wijk et al., 2007) to measure knowledge absorption relations. So, metadata should be referred to as measuring absorption at the spatial scale in that paper.

Measuring absorption function at the level of spatial units instead of at the level of organizations is helpful to measure and analyze geographic pathways of knowledge spillovers. Because knowledge absorption at a larger scale differs from regional scales, absorption is different in the targeting industry. However, network relations are important (Kuchiki & Tsuji, 2010). Thus, we can better understand the outcomes and effectiveness of public and private R&D expenditures on the organizations' innovative performance in each spatial unit considered. Antecedents of the inter-organizational knowledge transfer comprise the knowledge and organizational characteristics, network characteristics (Van Wijk et al., 2007), cultural and business context (Maldonado et al., 2019). Additionally, not individual or organizational, but the knowledge base of the cluster will affect the AC process of the organizations located in the cluster (Solano et al., 2020). From that point of view, the field of ordinary experience, formed by cluster members, is more critical than intra-organizational procedures. So, being in the cluster makes more sense than assimilating knowledge within organizations.

Organizations can benefit from a sizeable external knowledge range and specific knowledge that enhances their competitiveness and innovativeness by being in a cluster and facing negative effects. Companies in a cluster face stronger competition because companies in the same cluster have similar access to resources and markets. So, companies seek to differentiate and create distance in production and market from other companies in the clusters (Ferras-Hernandez & Nylund, 2019). Clusters positively affect organizational productivity and supply, but net returns have a reverse U shape (Duranton et al., 2010). Shi et al. (2019) found that there is a "nonlinear (curvilinear) relationship" between networks and innovation in technology-intensive industries. These authors found that "*too many external search channels and as well deeply relationships cannot improve even worsen innovation outcomes because of increasing exterior search costs and the potential danger of leakage key technologies*".

CLUSTERS AND BUSINESS ENVIRONMENT

At the country level, R&D investment positively increases innovation. Clusters are conducive environments or contexts (Gotz, 2019), distant knowledge sourcing is related to AC (Grashof et al., 2020). Supporting that view, Belso-Martínez et al. (2018) found that multinational organizations set up new subsidiaries in other clusters to benefit from extra-cluster knowledge, especially in intellectual capital. As a result, transnational organizations see clusters as national or multinational context bases rather than specified proximity. So, simultaneous measuring methods and variables for distant knowledge transfer with focused spatial effects are needed. Although hypotheses for measurement ACs are relatively simple, their measurement empirically is more complex. There is no longer a well-defined relationship between R&D and innovation; these relationships are moderated by dimensionality, proxy choice, use of the survey versus archival data, and the cultural and industry context of the study (Maldonado et al., 2019). Some firms, most often the small and medium-sized ones, maybe highly innovative despite the low R&D spending and levels.

On the other hand, organizational clusters and individuals collaborate and reciprocally interact to generate innovation (Liu et al., 2018). Consequently, measuring the effects of being a cluster member from a macro perspective is necessary for knowledge absorptive capacity theory. According to explanations, hypothesis 1 can be interpreted as:

H1: Being a cluster member positively increases the knowledge absorption capacity.

Even if broader external knowledge search increases AC (Koski & Svento, 2016) and interfirm knowledge flow exists in all types (Wu et al., 2020), external sources or search channels that firms rely upon are sparse and fragmented (Shi et al., 2019). Consequently, these heterogeneous collaboration networks and knowledge network resources negatively affect AC (Ardito & Messeni Petruzzelli, 2017; Zou et al., 2019) because of the quantity of knowledge available to absorb and exploit in these diverse contexts is also heterogeneous. Heterogeneity makes it difficult and increases the costs involved in absorbing new knowledge (Miles, 2012). From that point of view, clusters can improve the efficiency of knowledge flow and AC (Scherrer & Deflorin, 2017). However, the network dimension attributable to clusters stresses the importance of social networks and external knowledge sources, which contribute to developing the capabilities (García-Lillo et al., 2018). As a natural result, firm relational networks become more heterogeneous and distinctive; thus, accessing specific and unique opportunities and barriers is not just the cluster but business environment-related (Elche et al., 2018). Additionally, one of the significant differences between the clusters is navigating bureaucracy, including the ease of starting a business (Gannon & Pillai, 2013).

Cost of Redundancy Dismissal and Ease of Starting A Business and Absorption Capacity

Modern organization researchers and theorists have tried to define and analyze organization–environment relations on the conditions' dimensions and trends within environmental sectors (Hatch & Cunliffe, 2013). Based on the contingency theory approach, also factors may affect absorptive capacity. The contingency theory argues that the performance of firms, absorptive capacity in this paper, is related to the alignment between contingency factors such as size environmental factors (Donaldson, 2001; Ghofar & Islam, 2015). Consequently, when absorptive capacity researchers should define the external environment, they should consider the conditions and constraints in these environments relative to the country.

The ease of starting a business is vital to firms' innovation (Dreher & Gassebner, 2013). Furthermore, innovation is consequential to absorption capacity (Xie et al., 2018). In that sense, it can be a refreshing idea to research the relations between these two factors. The Doing Business Report, published annually by the World Bank, has been ranking the business environment of almost 200 countries worldwide (Doing Business, 2020). Business creation is related to absorption capacity (Gray, 2006). However, business creation is not homogenous globally. So, even if the absorption capacities can be the same different environmental factors in the national context can be significantly related to absorption capacity.

H2: Ease of Starting a Business positively increases the absorption capacity.

Another side of the coin is barriers to innovation. Many environmental blocks affect absorptive capacity (Ali Thawabieh & Saleem, 2016). Contingency theory asserts that contingency factors like environment are interrelated with innovation and knowledge absorption (Donaldson, 2001). So, we researched ease of starting a business, strategy, and Cost of Redundancy in the business environment as three contingency factors that may correlate with AC. The cost of redundancy dismissal, namely the financial cost of avoiding bankruptcy or closing a firm, is related to innovation. High innovative countries have low costs of leaving a business and vice versa (Franco & Oliveira, 2017; Hanafi & Arvanitis, 2013). Additionally, some contingencies negatively influence the organization's innovation related to different environmental contexts (Szulanski, 2000; Tidd, 2001).

H3: Cost of Redundancy Dismissal decreases the absorptive capacity of the firms.

Research Design

In this paper, the effects of cost of redundancy dismissal, ease of starting a business, and cluster development variables on knowledge absorption of organizations

are researched. In this context, the OECD country group was preferred in terms of economic size, development levels, and access to data (Australia, Austria, Belgium, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States). The analysis period covers the 2013-2018 period. The annual data was derived from the World Bank and Global Innovation Index sites. We used the natural logarithms of the data.

With panel data methodology, results give more informative data and more efficiency (Baltagi, 2005); also, there is less collinearity between the variables. Thus, we used panel data. Also, panel data models can better identify and measure the effects than pure cross-section or pure time-series data. Holding the organizations' characteristics constant, we can better analyze how cluster membership affects absorption capacity and how much. The estimation equation is shown in Equation (1).

$$KA_{it} = LNEASE_{it} + LNREDUND_{it} + LNCLUSTER_{it} + e_{it} \quad (1)$$

In Equation (1); knowledge absorption (High-technology exports (LNHE) & Intellectual property payments (LNIPP)), LNEASE: The ease of starting a business, LNREDUND: Cost of redundancy dismissal, LNCLUSTER: State of cluster development, e: error terms and i: 1,…,N (countries) and t: 1,…,T (time).

Variables represented knowledge absorption in the analyses, high-technology exports, and Intellectual property payments. High-technology exports (current US$): "These exports are products or services with high intellectual and research intensity, such as aerospace, IT, medical and healthcare products, scientific instruments, and electronic consumer products". Intellectual property payments (current US$): "Payments for the use of intellectual property rights and services (such as patents, production process, trademarks, copyrights, and franchises) and the licensing agreements applications of produced originals or prototypes (such as copyrights on books and manuscripts, software, plastic arts) and related rights (such as for social media and network performances)". Starting a business is easy to calculate organizations' distance to frontiers' score numbers. These scores are the simple average distance to frontier scores for each component indicator. Cost of redundancy dismissal: "the sum of the notice period and severance pay for redundancy dismissal (in salary time, with a minimum of eight weeks)". The state of cluster development is defined by the average answer to the survey question on the role of clusters in the economy. The question is: "In your area and country, how do clusters common and well-organized (geographic concentrations of firms, supply chains,

producers of related products and services, and specialized industrial organizations in a particular field)?" (Goedhuys et al., 2015)

A spurious regression problem may arise if the stationary of the series is not taken into consideration. Therefore, it is necessary to investigate the stationarity of the series (Esen and Dundar, 2021). The estimation equation for the unit root test is shown in Equation (2).

$$Y_{it} = \mu_i + \tau_i t + \rho\, Y_{it-1} + \delta_i \theta_t + e_{it} \quad (2)$$

The cross-sectional dependence is decisive in choosing the appropriate method for the unit root test. Because the cross-sectional dependence leads to decreased effectiveness of test statistics (Yıldırım et.al., 2020, Yıldırım et.al. 2021). First-generation tests do not consider cross-section dependence, and second-generation tests, on the other hand, consider cross-section dependence (Esen and Bayrak, 2017). First-generation tests are classified as first group tests (ρ is assumed not to change from unit to unit) and the second group (ρ is assumed to vary from unit to unit).

First and Second group unit root tests and basic hypotheses and alternative hypotheses: For the first group,
$H_0: \rho_i = \rho = 1$ (general unit root), $H_1: \rho_i = \rho < 1$ (no general unit root), and for second group tests, $H_0: \rho_i = 0$ (unit root in time series for all units) and $H_1: |\rho_i| < 0$ (unit root in time series for some units). Levin, Lin & Chu (2002) and Im, Pesaran & Shin (2003), which are widely used in the literature, were preferred to analyze stationarity. The LLC test is the first generation, the first group, and the IPS test is the first generation and the second-generation.

Results

Our study obtained preliminary information about the direction and strength of the relations between the series through correlation analysis. Table 1 shows the correlation analysis results.

Table 1
Correlation Analysis

	lnhe	lipp	ease	redund	Cluster
lnhe	1.000				
lipp	0.721	1.000			
ease	-0.211	-0.061	1.000		
redund	-0.106	-0.194	-0.246	1.000	
cluster	0.574	0.694	-0.018	-0.339	1.000

According to the results of the correlation analysis, the first noticeable result is that there are no multiple linear connection problems of the OLS analysis results. On the other hand, correlation results show no multicollinearity between the series. There is a negative correlation between the ease of starting a business, with both high-tech exports and intellectual capital payments. In contrast, there is a negative correlation between high-tech exports and intellectual capital payments. However, there is a positive correlation between being in a cluster, high-tech exports, and intellectual capital payments.

Unit Test results related to the stationarity of the series can be seen in Table 2.

Table 2
Unit Root Tests

		Intercept		Intercept&Trend	
Variables	Methods	Stat.	Prob.	Stat.	Prob.
LNEASE	LLC	-51.766	0.000	-32.074	0.000
	IPS	-7.129	0.000	-3.224	0.001
LNREDUND	LLC	-16.910	0.000	-8.443	0.000
	IPS	-2.980	0.001	0.161	0.564
LNCLUSTER	LLC	-79.034	0.000	-56.815	0.000
	IPS	-13.305	0.000	-7.735	0.000
LNHE	LLC	-3.273	0.001	-21.124	0.000
	IPS	1.714	0.957	0.043	0.517
LNIPP	LLC	-6.376	0.000	-11.993	0.000
	IPS	-0.084	0.467	0.849	0.802

When the results in Table 2 are examined, it can be implied that the LNEASE and LNCLUSTER series are stable for both LLC and IPS tests, according to constants and constants and trendline models. The LNREDUND, LNHE, and LNIPP series, on the other hand, are stationary for the LLC test and stable for both fixed and trendline models. The LNREDUND series is stationary for the IPS test compared to the fixed model, whereas the fixed and trendline model difference is unstationary. Finally, the LNHE and LNIPP series are not stationary for IPS testing and are stable for fixed and trendline models. As a result, it was decided that all series were stationary to minimize information loss.

Estimation of Equation (1) can be made after investigating the stationary state of the series. Equation (1) can be estimated in two ways, including fixed and random effects. The most important difference between the fixed effects results and the random-effects analysis model is whether the independent variables and unit effects are correlated. The fixed-effects model assumes that independent variables and unit effects

are correlated. On the other hand, independent variables and unit effects are not correlated according to the random-effects model. With the Hausman test, which of the fixed or random effect estimators is effective can be analyzed by chip-square distribution. The underlying hypothesis of the Hausman test is established that the random effect estimator is effective. Table 2 shows the Hausman test results.

Table 3
Hausman Test

Equations	***Chi-Sq. Statistic***	***Prob.***
Dependent variable: LNHE	17.748	0.000
Dependent variable: LNIPP	27.880	0.000

According to Table 3, the statistic provides strong evidence against the null misidentification hypothesis. Therefore, it is concluded that the fixed effects model estimator is effective for both forecasting models. Supporting results are shown in Table 4 for the choice of estimators of fixed & random-effects models.

Table 4
Fixed & Random Effect Comparisons

	DEPENDENT VARIABLE: LNHE				***Dependent variable: LIPP***			
Variables	**Fixed**	**Rando**	**Var(Diff.)**	**Prob.**	**Fixed**	**Rando**	**Var(Dif)**	**Prob.**
LNEASE	0.837	0.732	0.002	0.015	-0.022	-0.100	0.001	0.004
LNREDUND	-0.009	-0.036	0.000	0.074	0.013	0.004	0.000	0.342
LNCLUSTER	0.463	0.779	0.004	0.000	0.437	0.589	0.001	0.000

According to Table 4, the coefficients differ for the predictive equations where the dependent variable is LNHE and LIPP. In this regard, the underlying hypothesis that the coefficients do not differ is rejected. The fixed effects model results for both estimation models are shown in Table 5.

Table 5
Fixed Effect OLS Test Results

	Dependent variable: LNHE			***Dependent variable: LIPP***		
Variables	**Coefficient**	**t-Statistic**	**Prob.**	**Coefficient**	**t-Statistic**	**Prob.**
Constant	22.547	14.096	0.000	16.996	8.748	0.000
LNEASE	-0.022	-0.062	0.951	0.837	1.910	0.058
LNREDUND	0.013	0.180	0.858	-0.009	-0.103	0.918
LNCLUSTER	0.437	1.762	0.079	0.463	1.539	0.126

When Table 5 is analyzed, it is seen that the results change when the dependent variable is hi-tech exports and intellectual capital payments. Firstly, when the dependent variable is hi-tech exports, it is seen that the ease of starting companies or the increase in the possibilities of avoiding bankruptcy does not have a statistically significant effect on

high-tech product exports. On the other hand, a firm's inclusion in a cluster affects positively and statistically significant. A one-unit increase in the cluster's involvement increases high-tech exports by 0.4 %.

In the other part of the table, it is seen that when the dependent variable has intellectual capital payments, being a member of a cluster or getting rid of the cost of redundancy dismissal does not have a statistically significant effect on intellectual capital payments. On the other hand, the ease of starting a business has a positive and statistically significant effect on intellectual capital payments. A one-unit increase in the ease of starting a business increases intellectual capital payments by 0.8 %.

Discussion

This paper discusses the effects of clusters and the business environment on the knowledge absorption capacity of the organizations. Because the knowledge transfer occurs between parties relative to their context (Lane et al., 2001). We used high-technology exports and intellectual capital payment variables as a proxy for knowledge absorption capacity and ease of starting a business to study these concepts. We used the cost of redundancy dismissal variable as the proxy of the business environment.

Successful organizations create value through absorption and extract that value by strategically leveraging their intellectual property to enhance their competitive position. A significant positive impact of international trade on productivity growth also has been found at the country-level and firm-level (De Loecker, 2007). Nevertheless, the results are contradictory for the domestic level (Harrison, 1995). Additionally, in the previous literature, absorption capacity measurement is problematic when analyzing from the national and sector perspective rather than from the firm and product levels perspective (Jaffe, 1989; Vicente, 2018). This paper aims to support these previous study results and bring further depth and breadth to the literature. First, we provide an empirical contribution by new external knowledge absorption proxy variables. Another critical contribution analyzes the importance of cluster effects from network relations. Lastly, there are methodological contributions from results concerning a more definite identification of “learning through exporting” phenomena and individual factors at the national level from the intellectual property perspective.

According to panel data analysis, Hypothesis 1 (Being a cluster member positively increases the knowledge absorption capacity) is partially accepted depending on the proxy variable of the knowledge absorption capacity. Being in the clusters increases the exports of hi-tech firms by 0.4% more. When the proxy is high-tech exports, firms are hi-tech export intended to be in the cluster positively increases. These results are coherent with the research of Dai and Yu (2013). They claimed that absorptive

capacity developed through pre-export R&D investment. These results also support the idea that firms' participation in the export market makes them more productive, which is a phenomenon known as "learning through exporting," Although this belief has not always been supported by empirical research at the firm level (Goldberg et al., 2008) we have proofed it at the spatial cluster level. Relationships between local firms and multinationals can equally important serve as a knowledge absorption catalyst (Pack & Saggi, 2001; Radovanovic & Matovic, 2016). Like these relations, clusters are likely to play a significant role in the knowledge absorption context, but hi-tech clusters (Pan et al., 2019). Our country-level data, described in the methodology, measure how participation in such cluster networks affects the adoption of new-to-the-firm technology. Therefore, cluster formation can be the spatial limit to the external absorption capacity.

However, when intellectual property payments are a dependent proxy variable of knowledge absorption capacity being in the clusters and the cost of redundancy dismissal has no significant effects. This result is supported by other researchers (Ahmed et al., 2019; Audretsch & Lehmann, 2005; Wellman, 2009) that interaction among employees is more crucial than organizational networks. The absorption process is facilitated by the country, firm, and individual-level factors (Gaur et al., 2019); their importance may change contingently. Nevertheless, the ease of starting a business has significant positive effects. When starting a business is comfortable talented people get courage, but the firm is not sustainable as they think. So, when the dependent variable is intellectual property, payments ease of starting a business is a significant positive effect that Hypothesis 2 is partially accepted.

Hypothesis 2 is partially excepted because the ease of starting a business is significant when the firms start this process out of clusters. However, when the ease of starting a business is statistically relevant, it affects absorption capacity. That is because the competition in the clusters may be too stiff for a new entry, or the industry is expensive to leave after investment. That brings us to Hypothesis 3, which argues that the Cost of Redundancy Dismissal decreases the firm's absorptive capacity. Hypothesis 3 is accepted because when firms are in the clusters and exporting, the Cost of Redundancy Dismissal or avoiding bankruptcy is no longer related to absorption capacity. Additionally, when intellectual property payments are a proxy of absorption capacity, still the cost of redundancy dismissal is not significant. However, according to the correlation table, it decreases the absorption capacity.

The outcomes of this study enrich the theoretical foundation of absorptive capacity and network and provide critical contributions to the cluster of high-technology exporter firms. The outcomes may provide important implications for high-tech cluster enterprises that attempt to improve exports and knowledge absorption capacities and

nations that try to compensate for the business environment for companies. At a national level, being a member of cluster formation is especially productive for hi-tech exporting firms. Thus, nations with the most extensive knowledge stocks will thereby produce newer knowledge through a more open exportation process. However, at the individual level, the ease of starting a business should include economic means and intellectual capital dimensions.

References

Ahmed, S. S., Guozhu, J., Mubarik, S., Khan, M., & Khan, E. (2019). Intellectual capital and business performance: The role of dimensions of absorptive capacity. *Journal of Intellectual Capital*, *21*(1), 23–39. https://doi.org/10.1108/JIC-11-2018-0199

Ali Thawabieh, D. F., & Saleem, M. (2016). Organizational Creativity and Competitive Advantage: A GCC Perspective. *International Journal of Economics & Management Sciences*, *5*(4). https://doi.org/10/ggjdj7

Aoki, M., & Takizawa, H. (2002). Information, Incentives, and Option Value: The Silicon Valley Model. *Journal of Comparative Economics*, *30*, 759–786. https://doi.org/10/dht2p5

Ardito, L., & Messeni Petruzzelli, A. (2017). Breadth of external knowledge sourcing and product innovation: The moderating role of strategic human resource practices. *European Management Journal*, *35*(2), 261–272. https://doi.org/10/gg3mvh

Arun, K., & Kahraman Gedik, N. (2020). Impact of Asian cultural values upon leadership roles and styles. *International Review of Administrative Sciences*. https://doi.org/10.1177/0020852320935982

Arun, K., & Yıldırım, D. Ç. (2017). Effects of foreign direct investment on intellectual property, patents and R&D. *Queen Mary Journal of Intellectual Property*, *7*(2), 226–241. https://doi.org/10/gbnx8w

Audretsch, D. B., & Lehmann, E. E. (2005). Does the Knowledge Spillover Theory of Entrepreneurship hold for regions? *Research Policy*, *34*(8), 1191–1202. https://doi.org/10.1016/j.respol.2005.03.012

Belso-Martínez, J. A., López-Sánchez, M. J., & Mateu-García, R. (2018). New MNE subsidiaries in old clusters: When, why, and how. *Review of Managerial Science*, *12*(2), 441–467. https://doi.org/10/gc5mqb

Belso-Martínez, J.-A., Expósito-Langa, M., & Tomás-Miquel, J.-V. (2016). Knowledge network dynamics in clusters: Past performance and absorptive capacity. *Baltic Journal of Management*, *11*(3), 310–327. https://doi.org/10.1108/BJM-02-2015

Bocquet, R., & Mothe, C. (2010). Knowledge governance within clusters: The case of small firms. *Knowledge Management Research & Practice*, *8*(3), 229–239. https://doi.org/10/cbbj9b

Botelho, A. J. J., & Bastos, G. M. (2010). Innovation as a Driver for Building an Oil & Gas Industrial Cluster in Rio de Janeiro, Brazil. In A. Kuchiki & M. Tsuji (Eds.), *From Agglomeration to Innovation* (pp. 326–356). Palgrave Macmillan UK. https://doi.org/10.1057/9780230251014_10

Bradford, J., & Saad, M. (2014). Towards a method for measuring Absorptive Capacity in firms. *International Journal of Technology Management & Sustainable Development*, *13*(3), 237–249. https://doi.org/10/ggjc5p

Butler, M. J. R., & Ferlie, E. (2019). Developing Absorptive Capacity Theory for Public Service Organizations: Emerging UK Empirical Evidence. *British Journal of Management*, 1467-8551.12342. https://doi.org/10.1111/1467-8551.12342

Cassiman, B., & Veugelers, R. (2006). In Search of Complementarity in Innovation Strategy: Internal R&D and External Knowledge Acquisition. *Management Science*, *52*(1), 68–82. https://doi.org/10/d97mm4

Chain, C. P., Santos, A. C. dos, Castro, L. G. de, & Prado, J. W. do. (2019). BIBLIOMETRIC ANALYSIS OF THE QUANTITATIVE METHODS APPLIED TO THE MEASUREMENT OF INDUSTRIAL CLUSTERS: BIBLIOMETRIC ANALYSIS OF THE QUANTITATIVE METHODS. *Journal of Economic Surveys*, *33*(1), 60–84. https://doi.org/10/gg3twx

Chandrashekar, D., & Mungila Hillemane, B. S. (2018). Absorptive capacity, cluster linkages, and innovation: An evidence from Bengaluru high-tech manufacturing cluster. *Journal of Manufacturing Technology Management*, *29*(1), 121–148. https://doi.org/10/gcsg9n

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, *35*(1), 128. https://doi.org/10.2307/2393553

Dai, M., & Yu, M. (2013). Firm R&D, Absorptive Capacity and Learning by Exporting: Firm-level Evidence from China: LEARNING BY EXPORTING. *The World Economy*, *36*(9), 1131–1145. https://doi.org/10/ggjn7f

De Loecker, J. (2007). Do exports generate higher productivity? Evidence from Slovenia. *Journal of International Economics*, *73*(1), 69–98. https://doi.org/10/b5dscf

Doing Business. (2020). [Text/HTML]. World Bank. https://www.doingbusiness.org/en/doingbusiness

Donaldson, L. (2001). *The contingency theory of organizations*. Sage Publications.

Dreher, A., & Gassebner, M. (2013). Greasing the wheels? The impact of regulations and corruption on firm entry. *Public Choice*, *155*(3–4), 413–432. https://doi.org/10/cw54zp

Du, J., Lu, J., & Guo, Y. (2015). Relationship between Technological Diversification of Social Network and Technological Innovation Performance: Empirical Evidence from China. *Science, Technology and Society*, *20*(1), 60–88. https://doi.org/10/f7gkrc

Duranton, G., Martin, P., Mayer, T., & Mayneris, F. (2010). *The Economics of Clusters*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199592203.001.0001

Elche, D., García-Villaverde, P. M., & Martínez-Pérez, Á. (2018). Inter-organizational relationships with core and peripheral partners in heritage tourism clusters: Divergent effects on innovation. *International Journal of Contemporary Hospitality Management*, *30*(6), 2438–2457. https://doi.org/10/gdvr4r

Ferras-Hernandez, X., & Nylund, P. A. (2019). Clusters as Innovation Engines: The Accelerating Strengths of Proximity. *European Management Review*, *16*(1), 37–53. https://doi.org/10/gg3qsf

Flatten, T. C., Engelen, A., Zahra, S. A., & Brettel, M. (2011). A measure of absorptive capacity: Scale development and validation. *European Management Journal*, *29*(2), 98–116. https://doi.org/10/fbw2t6

Fosfuri, A., & Tribo, J. (2008). Exploring the antecedents of potential absorptive capacity and its impact on innovation performance. *Omega*, *36*(2), 173–187. https://doi.org/10/d29vpd

Franco, C., & Oliveira, R. H. de. (2017). Inputs and outputs of innovation: Analysis of the BRICS. *RAI Revista de Administração e Inovação*, *14*(1), 79–89. https://doi.org/10/ggjdn3

Ganesan, S., Malter, A. J., & Rindfleisch, A. (2005). Does Distance Still Matter? Geographic Proximity and New Product Development. *Journal of Marketing*, *69*(4), 44–60. JSTOR. https://doi.org/10/dtzkfv

Gannon, M. J., & Pillai, R. (2013). *Understanding global cultures: Metaphorical journeys through 31 nations, clusters of nations, continents, and diversity* (5th ed). Sage Publications.

García-Lillo, F., Claver-Cortés, E., Marco-Lajara, B., Úbeda-García, M., & Seva-Larrosa, P. (2018). On clusters and industrial districts: A literature review using bibliometrics methods, 2000-2015: On clusters and industrial districts. *Papers in Regional Science*, *97*(4), 835–861. https://doi.org/10/gg3trr

Gaur, A. S., Ma, H., & Ge, B. (2019). MNC strategy, knowledge transfer context, and knowledge flow in MNEs. *Journal of Knowledge Management*, *23*(9), 1885–1900. https://doi.org/10/ggjn7b

Ghofar, A., & Islam, S. M. N. (2015). *Corporate Governance and Contingency Theory*. Springer International Publishing. https://doi.org/10.1007/978-3-319-10996-1

Giuliani, E., Balland, P.-A., & Matta, A. (2019). Straining but not thriving: Understanding network dynamics in underperforming industrial clusters. *Journal of Economic Geography*, *19*(1), 147–172. https://doi.org/10/gfc3zm

Goedhuys, M., Hollanders, H., Mohnen, P., Dutta, S., Lanvin, B., & Wunsch-Vincent, S. (2015). *Innovation Policies for Development*.

Goes, J. B., & Park, S. H. (1997). INTERORGANIZATIONAL LINKS AND INNOVATION: THE CASE OF HOSPITAL SERVICES. *Academy of Management Journal*, *40*(3), 673–696. https://doi.org/10/c9qnbz

Goldberg, I., Branstetter, L., Goddard, J. G., & Kuriakose, S. (2008). *Globalization and Technology Absorption in Europe and Central Asia: The Role of Trade, FDI, and Cross-border Knowledge Flows*. The World Bank. https://doi.org/10.1596/978-0-8213-7583-9

Gotz, M. (2019). The Industry 4.0 Induced Agility and New Skills in Clusters. *Foresight and STI Governance (Foresight-Russia till No. 3/2015)*, *13*(2), 72–83.

Grandinetti, R. (2016). Absorptive capacity and knowledge management in small and medium enterprises. *Knowledge Management Research & Practice*, *14*(2), 159–168. https://doi.org/10/ggjc4r

Grashof, N., Kopka, A., Wessendorf, C., & Fornahl, D. (2020). Industry 4.0 and clusters: Complementaries or substitutes in firm's knowledge creation? *Competitiveness Review: An International Business Journal*, *ahead-of-print*(ahead-of-print). https://doi.org/10/gg3qn9

Gray, C. (2006). Absorptive capacity, knowledge management and innovation in entrepreneurial small firms. *International Journal of Entrepreneurial Behavior & Research*, *12*(6), 345–360. https://doi.org/10/drpnds

Hamdouch, A. (2010). Conceptualising innovation networks and clusters. *Innovation Networks and Clusters: The Knowledge Backbone. Bruxelles: PIE Peter Lang*.

Hanafi, S., & Arvanitis, R. (2013). *Strengths and weaknesses of science and technology institutions in Arab countries*.

Harris, R., & Yan, J. (2019). THE MEASUREMENT OF ABSORPTIVE CAPACITY FROM AN ECONOMICS PERSPECTIVE: DEFINITION, MEASUREMENT AND IMPORTANCE. *Journal of Economic Surveys*, *33*(3), 729–756. https://doi.org/10/ggnqxr

Harrison, A. (1995). *Determinants and Effects of Direct Foreign Investment in Cote d'Ivoire, Morocco, and Venezuela*.

Hatch, M. J., & Cunliffe, A. L. (2013). *Organization theory: Modern, symbolic, and postmodern perspectives* (Third edition). Oxford University Press.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, *115*(1), 53–74. https://doi.org/10.1016/S0304-4076(03)00092-7

Jaffe, A. B. (1989). Real Effects of Academic Research. *The American Economic Review*, *79*(5), 957–970. JSTOR.

Jane Zhao, Z., & Anand, J. (2009). A multilevel perspective on knowledge transfer: Evidence from the Chinese automotive industry. *Strategic Management Journal*, *30*(9), 959–983. https://doi.org/10/fb96q3

Jansen, J. J. P., Van Den Bosch, F. A. J., & Volberda, H. W. (2005). Managing Potential and Realized Absorptive Capacity: How do Organizational Antecedents Matter? *Academy of Management Journal*, *48*(6), 999–1015. https://doi.org/10/dwkzw8

Jiří, N., Jana, N., Oldřich, H., & Peter, H. (2017). Regional disparities, absorption capacity and Structural Fund payments: A case study of the Czech Republic. *Quaestiones Geographicae*, *36*(4), 81–92. https://doi.org/10/gg4jr8

Kang, K. H., & Kang, J. (2014). Do External Knowledge Sourcing Modes Matter for Service Innovation? Empirical Evidence from South Korean Service Firms: External knowledge sourcing for service innovation. *Journal of Product Innovation Management*, *31*(1), 176–191. https://doi.org/10/gfw3rr

Kim, M., Suresh, N. C., & Kocabasoglu-Hillmer, C. (2013). An impact of manufacturing flexibility and technological dimensions of manufacturing strategy on improving supply chain responsiveness: Business environment perspective. *International Journal of Production Research*, *51*(18), 5597–5611. https://doi.org/10/gg3d2h

Koski, H., & Svento, R. (2016). Complementarity of firms' innovation strategies: Knowledge search, in-house R&D and external R&D acquisition. *International Journal of Technology Transfer and Commercialisation*, *14*(2), 150. https://doi.org/10/gg3ndv

Kuchiki, A., & Tsuji, M. (Eds.). (2010). *From Agglomeration to Innovation: Upgrading Industrial Clusters in Emerging Economies*. Palgrave Macmillan UK. https://doi.org/10.1057/9780230251014

Lane, P. J., Koka, B. R., & Pathak, S. (2006). The Reification of Absorptive Capacity: A Critical Review and Rejuvenation of the Construct. *The Academy of Management Review*, *31*(4), 833–863. JSTOR. https://doi.org/10/dkztgh

Lane, P. J., Salk, J. E., & Lyles, M. A. (2001). Absorptive capacity, learning, and performance in international joint ventures. *Strategic Management Journal*, *22*(12), 1139–1161. https://doi.org/10.1002/smj.206

Latour, B. (2005). *Reassembling the social: An introduction to actor-network-theory*. Oxford University Press.

Levin, A., Lin, C.-F., & Chu, C.-S. J. (2002). Unit Root Tests in Panel Data: Asymptotic and. *Journal of Econometrics*, 1–24.

Li, H., Chen, J., Wan, Z., Zhang, H., Wang, M., & Bai, Y. (2020). Spatial evaluation of knowledge spillover benefits in China's free trade zone provinces and cities. *Growth and Change*, *51*(3), 1158–1181. https://doi.org/10/ghd8r2

Li, J. H., Chang, X. R., Lin, L., & Ma, L. Y. (2014). Meta-analytic comparison on the influencing factors of knowledge transfer in different cultural contexts. *Journal of Knowledge Management*, *18*(2), 278–306. https://doi.org/10.1108/JKM-08-2013-0316

Liu, J., Feng, Y., Zhu, Q., & Sarkis, J. (2018). Green supply chain management and the circular economy: Reviewing theory for advancement of both fields. *International Journal of Physical Distribution & Logistics Management*, *48*(8), 794–817. https://doi.org/10/gfbk4d

Liu, S. (Ed.). (2010). *Theory of science and technology transfer and applications*.CRC Press.

Maldonado, T., Salaiz, A., Vera, D., & Keller, R. T. (2019). Taking Stock of the Absorptive Capacity Construct and its Dimensions in the Context of Technological Innovation: A Meta-Analytic Approach. *IEEE Transactions on Engineering Management*, *66*(2), 193–207. https://doi.org/10/gg3t5f

Matusik, S. F., & Heeley, M. B. (2005). Absorptive Capacity in the Software Industry: Identifying Dimensions That Affect Knowledge and Knowledge Creation Activities. *Journal of Management*, *31*(4), 549–572. https://doi.org/10/djwz4s

Miles, J. A. (2012). *Management and organization theory: A Jossey-Bass reader* (1. ed). Jossey-Bass.

Moilanen, M., Østbye, S., & Woll, K. (2014). Non-R&D SMEs: External knowledge, absorptive capacity and product innovation. *Small Business Economics*, *43*(2), 447–462. https://doi.org/10/gfbz9p

Moreira, S., Markus, A., & Laursen, K. (2018). Knowledge diversity and coordination: The effect of intrafirm inventor task networks on absorption speed. *Strategic Management Journal*, *39*(9), 2517–2546. https://doi.org/10/gg4kh5

Movahedian-Attar, F. (2016). A participative method to improve knowledge absorption capacity in collaborative innovation projects. *2016 IEEE Tenth International Conference on Research Challenges in Information Science (RCIS)*, 1–6. https://doi.org/10/ghd7xd

Mueller, E. F., & Jungwirth, C. (2016). What drives the effectiveness of industrial clusters? Exploring the impact of contextual, structural and functioning determinants. *Entrepreneurship & Regional Development*, *28*(5–6), 424–447. https://doi.org/10/ggjc4s

Murovec, N., & Prodan, I. (2009). Absorptive capacity, its determinants, and influence on innovation output: Cross-cultural validation of the structural model. *Technovation*, *29*(12), 859–872. https://doi.org/10/dfksv6

Newey, L., & Verreynne, M.-L. (2011). Multilevel absorptive capacity and interorganizational new product development: A process study. *Journal of Management & Organization*, *17*(1), 39–55. https://doi.org/10/ggjc4v

Pack, H., & Saggi, K. (2001). Vertical technology transfer via international outsourcing. *Journal of Development Economics*, *65*(2), 389–415. https://doi.org/10/cqhw5b

Pan, X., Song, M. L., Zhang, J., & Zhou, G. (2019). Innovation network, technological learning and innovation performance of high-tech cluster enterprises. *Journal of Knowledge Management*, *23*(9), 1729–1746. https://doi.org/10/ggjn7d

Pérez Hernández, C. C., Lara Gómez, G., & Gómez Hernández, D. (2017). Evolution of state clusters related with technological capability in Mexico: Application of a multivariate statistical analysis of cluster. *Contaduría y Administración*, *62*(2), 528–555. https://doi.org/10/ggjc4q

Pi, L., Paetzold, K., & Ortt, R. (2018). External Knowledge Absorption in SMEs. *2018 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC)*, 1–9. https://doi.org/10/gg3dv4

Prajogo, D. I. (2016). The strategic fit between innovation strategies and business environment in delivering business performance. *International Journal of Production Economics*, *171*, 241–249. https://doi.org/10/gf8frb

Radovanovic, N., & Matovic, D. (2016). Organizational forms and knowledge absorption. *Industrija*, *44*(3), 175–190. https://doi.org/10.5937/industrija44-9884

Reiche, B. S. (2011). Knowledge transfer in multinationals: The role of inpatriates' boundary spanning. *Human Resource Management*, *50*(3), 365–389. https://doi.org/10/bwgxcn

Rinkinen, S., & Harmaakorpi, V. (2018). The business ecosystem concept in innovation policy context: Building a conceptual framework. *Innovation: The European Journal of Social Science Research*, *31*(3), 333–349. https://doi.org/10/gdsk6w

Rodríguez, A. J. G., Barón, N. J., & Martínez, J. M. G. (2020). Validity of Dynamic Capabilities in the Operation Based on New Sustainability Narratives on Nature Tourism SMEs and Clusters. *Sustainability*, *12*(3), 1004. https://doi.org/10/gg4jwq

Rojo, A., Llorens-Montes, J., & Perez-Arostegui, M. N. (2016). The impact of ambidexterity on supply chain flexibility fit. *Supply Chain Management: An International Journal*, *21*(4), 433–452. https://doi.org/10/f8vhdj

Šarić, S. (2012). *Competitive Advantages through Clusters*. Gabler Verlag. https://doi.org/10.1007/978-3-8349-3554-

Scherrer, M., & Deflorin, P. (2017). Prerequisite for lateral knowledge flow in manufacturing networks. *Journal of Manufacturing Technology Management*, *28*(3), 394–419. https://doi.org/10/gg3ngv

Sedita, S. R., Caloffi, A., & Lazzeretti, L. (2020). The invisible college of cluster research: A bibliometric core–periphery analysis of the literature. *Industry and Innovation*, *27*(5), 562–584. https://doi.org/10/gg3qq8

Shi, X., Zhang, Q., & Zheng, Z. (2019). The double-edged sword of external search in collaboration networks: Embeddedness in knowledge networks as moderators.

Journal of Knowledge Management, *23*(10), 2135–2160. https://doi.org/10/gg3mvc

Solano, G., Larrañeta, B., & Aguilar, R. (2020). Absorptive capacity balance and new venture performance: Cultivating knowledge from regional clusters. *Technology Analysis & Strategic Management*, 1–13. https://doi.org/10/gg3k46

Song, Y., Gnyawali, D. R., Srivastava, M. K., & Asgari, E. (2018). In Search of Precision in Absorptive Capacity Research: A Synthesis of the Literature and Consolidation of Findings. *Journal of Management*, *44*(6), 2343–2374. https://doi.org/10/gdrb4q

Spanos, Y. E., & Voudouris, I. (2009). Antecedents and trajectories of AMT adoption: The case of Greek manufacturing SMEs. *Research Policy*, *38*(1), 144–155. https://doi.org/10/crdkf3

Szulanski, G. (2000). The Process of Knowledge Transfer: A Diachronic Analysis of Stickiness. *Organizational Behavior and Human Decision Processes*, *82*(1), 9–27. https://doi.org/10/b8qp88

Tepic, M., Trienekens, J. H., Hoste, R., & Omta, S. W. F. (Onno). (2012). The Influence of Networking and Absorptive Capacity on the Innovativeness of Farmers in the Dutch Pork Sector. *International Food and Agribusiness Management Review*, *15*(3), 1–34. https://doi.org/10/gghv2r

Tidd, J. (2001). Innovation management in context: Environment, organization and performance. *International Journal of Management Reviews*, *3*(3), 169–183. https://doi.org/10/c53ggj

Todorova, G., & Durisin, B. (2007). Absorptive Capacity: Valuing a Reconceptualization. *The Academy of Management Review*, *32*(3), 774–786. JSTOR. https://doi.org/10/bq8wx8

van Wijk, R., Jansen, J. J. P., & Lyles, M. A. (2008). Inter- and Intra-Organizational Knowledge Transfer: A Meta-Analytic Review and Assessment of its Antecedents and Consequences. *Journal of Management Studies*, *45*(4), 830–853. https://doi.org/10/dtbmn2

Van Wijk, R., Jansen, J., & Lyles, M. (2007). ORGANIZATIONAL KNOWLEDGE TRANSFER: A META-ANALYTIC REVIEW OF ITS ANTECEDENTS AND OUTCOMES. *Academy of Management Proceedings*, *2007*(1), 1–6. https://doi.org/10/bbc578

Vicente, J. (2018). Untraded Interdependencies and Cluster Formation. In J. Vicente, *Economics of Clusters* (pp. 21–46). Springer International Publishing. https://doi.org/10.1007/978-3-319-78870-8_3

Wellman, J. L. (2009). *Organizational learning: How companies and institutions manage and apply knowledge* (1st ed). Palgrave Macmillan.

Williander, M. (2007). Absorptive capacity and interpretation system's impact when 'going green': An empirical study of ford, volvo cars and toyota. *Business Strategy and the Environment*, *16*(3), 202–213. https://doi.org/10/cg279t

Wu, D., Wu, X., Zhou, H., & Kang, M. (2020). Interfirm networks and search-transfer problem: The role of geographic proximity. *Industrial Management & Data Systems*, *120*(5), 923–940. https://doi.org/10/gg3k6k

Xie, X., Zou, H., & Qi, G. (2018). Knowledge absorptive capacity and innovation performance in high-tech companies: A multi-mediating analysis. *Journal of Business Research*, *88*, 289–297. https://doi.org/10/ggjdjn

Yadav, R., & Chaudhari, S. (2018). Work Values: Generation Y Expectations and HRM Implications (Study of an Indian Public Sector Non-Life Insurer). *Bimaquest*, *18*(1).

Zahra, S. A., & George, G. (2002). Absorptive Capacity: A Review, Reconceptualization, and Extension. *The Academy of Management Review*, *27*(2), 185. https://doi.org/10/fvkm9g

Zou, B., Guo, F., & Guo, J. (2019). Antecedents and outcomes of breadth and depth of absorptive capacity: An empirical study. *Journal of Management & Organization*, *25*(5), 764–782. https://doi.org/10/gghv2q

Zou, T., Ertug, G., & George, G. (2018). The capacity to innovate: A meta-analysis of absorptive capacity. *Innovation*, *20*(2), 87–121. https://doi.org/10/gg3k6m