Applying Evolutionary Economic Geography beyond case studies in the Global North: Regional diversification in Vietnam

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Papers in Evolutionary Economic Geography

21.24

Utrecht University Human Geography and Planning

How do regions diversify in Vietnam?

Learning about regional diversification beyond the usual suspects

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- This is the pre-peer reviewed version of the following forthcoming article: Breul, M. and Pruß, F. (2022): Applying Evolutionary Economic Geography beyond case studies in the Global North: Regional diversification in Vietnam, in: Singapore Journal of Tropical Geography -

Abstract

Hitherto, the path-dependent understanding of regional diversification in Evolutionary Economic Geography (EEG) largely draws from insights of industrialized countries. However, in the last decades several regions in the Global South have undergone rapid structural transformations despite starting from unfavourable regional asset bases. This raises the question whether the strong emphasis on endogenous capabilities in EEG also provides a sound theoretical framework to explain these tremendous diversification dynamics in several economies in the Global South. Therefore, this paper aims to re-evaluate the wider validity of the path-dependent conceptualization of regional diversification in a Global South context. To this aim, we analyse the diversification of Vietnamese regions between 2006 and 2015. In order to take into account context-specific conditions that characterize Vietnam's economy we add the role of foreign firms and state-owned enterprises to the conceptualization of regional diversification processes. While the role of relatedness holds true for Vietnam, the presence of foreign firms allowed Vietnamese regions to uncouple from path dependency and jump to unrelated industries. The findings highlight that only by adapting the analysis to context-specific conditions are we able to understand how regional diversification takes place across different settings.

Keywords: Regional diversification, relatedness, Evolutionary Economic Geography, path creation, Global South, Vietnam

1 Introduction

Economic diversification through the development of new industries and products is perceived as fundamental for long-term economic success, both for countries and regions (Content & Frenken, 2016; Hidalgo et al., 2007). How new industries evolve in regions and how regions diversify over time have therefore been key topics in Economic Geography over the last decades. In particular, Evolutionary Economic Geography (EEG) has shaped the way we think of these processes. EEG understands the development of new industries as a regional branching process, meaning that regions tend to create new industrial paths that are related to pre-existing regional economic structures (Boschma & Frenken, 2006, 2011). An increasing number of studies find evidence for this path- dependent nature of regional diversification (Boschma et al., 2013; Boschma et al., 2015; Essletzbichler, 2015; Kogler et al., 2013; Mewes & Broekel, 2020; Neffke et al., 2011; Rigby, 2015).

However, up to now, this conceptualization largely draws from insights of industrialized countries. While related diversification "is reasonable for mature and developed economies, which are supported by knowledge intensive sectors with good market systems" (He et al., 2018, p. 176), some scholars have questioned if these mechanisms can be seen as universal, also explaining the massive process of productive change several economies of the Global South experienced in the last decades (Alonso & Martín, 2019; He et al., 2018; Zhu et al., 2017). They emphasize the need to extend research beyond the existing strong focus on industrialized countries in Europe or North America to broaden our understanding on regional diversification in distinct settings. Recently, first endeavours have complemented insights from regional diversification processes in upper-middle income and BRIC-economies (Alonso & Martín, 2019; He et al., 2018; Zhu et al., 2017). However, greatest structural change according to the economic complexity ranking between 2005 and 2015 took place especially in low-income and lower-middle income economies such as Cambodia, the Philippines, Uganda, Vietnam, and Zambia indicating an increasing diversification towards more complex products (The Growth Lab at Harvard University). Up to now, no study has investigated whether these vast industrial dynamics in lower-income and lower-middle income economies can also be explained by related diversification.

This study aims to contribute to fill this significant gap by analyzing how regional diversification in the lower-middle income economy Vietnam has taken place between 2005 and 2015. As a transitional economy, Vietnam has undergone an enormous industrial transformation process since the introduction of its renovation policy *Doi Moi* in 1986. In the economic complexity ranking, the country improved its rank from 107th in 1995 to 52nd in 2018, indicating an increasing diversification towards more complex products (The Growth Lab at Harvard University). Vietnam's economic dynamics have been characterized by a high influx of foreign-invested enterprises (FIEs) and increasing integration into global production networks. At the same time, state-owned enterprises (SOEs) have remained influential economic actors in the Vietnamese economy (Nguyen & Revilla Diez, 2017; Revilla Diez, 2016).

In order to take into account these context-specific conditions and include more geographical wisdom as recently claimed by Boschma (2017), we add the role of FIEs and SOEs to the conceptualization of regional diversification processes. This will help to extend our knowledge on regional diversification largely drawn from the experience of advanced industrial economies and re-evaluate the wider validity of the path-dependent conceptualization of regional diversification in a different context.

First, EEG has been criticized to put too much emphasis on endogenous capabilities as drivers of regional diversification (e.g. Binz et al., 2016; Hassink et al., 2019). This view would have restricted the diversification potential of many regions across the Global South that by now diversified their economies to a considerable extent despite starting from an unfavourable regional asset base. Recent research suggests that these local constraints can be overcome through the access to extraregional linkages, such as trade or FIEs (Alonso & Martín, 2019; Hassink et al., 2019; He et al., 2018; Isaksen & Trippl, 2017).

Second, policy interventions in the form of SOEs can certainly also leave traces on regional diversification. On the one hand, SOEs can reduce the role of relatedness for regional diversification as they are lesser bound to pressure on short-term profitability and efficiency, but may follow long-term developmental goals deemed strategic by the government (Zhu et al., 2018). On the other hand, a strong focus of governments on SOEs can cause crowding out effects of private sector development (Nguyen et al., 2013; Zhu et al., 2018).

Our findings show that relatedness also matters for regional diversification in the Vietnamese context. However, FIEs act as a global pipeline to extra-regional assets, thereby reducing the influence of related regional industrial structures for new path creation. Besides contributing with a case study on Vietnam to our understanding on how regional diversification takes place beyond the usual suspects in a lower-middle income economy, the study adds to the current debate on how extra-regional actors influence regional diversification (Boschma, 2017; Hassink et al., 2019).

The paper proceeds as follows: Section 2 reviews the existing literature on regional diversification and confronts it with insights from the Global South. The following section 3 describes the data and methodology. The empirical results are presented and discussed in section 4. Finally, the paper summarizes the main findings and outlines its contribution to debates on regional diversification.

2 Understanding regional diversification beyond the usual suspects

Since its foundation, a main line of inquiry in EEG research has been to explain how regions diversify over time and why the ability to create new industries differs across regions (Boschma, 2017; Boschma & Frenken, 2011). EEG conceptualizes the development of new regional industrial paths as the result of a regional branching process. In this process, industrial paths do not emerge from scratch, but either grow out of an existing industry or develop as the result of a recombination of competences from different existing industries (Boschma & Frenken, 2011). A key idea of this conceptualization is that locally related activities act as an enabling environment for regional diversification to take place. This idea is based on two arguments: First, knowledge spillovers are more likely to occur between industries that are technologically related (Frenken et al., 2007). Second, knowledge transfer mechanisms such as spinoffs, firm diversification, labor mobility, and social networking tend to have a strong regional bias (Boschma & Frenken, 2011). According to this logic, regions tend to diversify into industries that are closely related to existing structures, and the regional industrial evolution, hence, is characterized by a path-dependent nature.

Taking these ideas as a starting point, a number of studies were undertaken during the last decade to analyze to what extent technological relatedness has shaped the industrial and technological evolution of regions. In their seminal study on manufacturing industries in Swedish regions, Neffke et al. (2011) found that a new industry entry was more likely in regions with capabilities related to the new industry. Essletzbichler (2015) finds a similar effect for the industrial evolution of US metropolitan areas. The importance of relatedness for diversification processes was also confirmed by Boschma et al. (2013) in a study on export profiles in Spanish regions. Their results also reveal that related industries are more influential on a regional rather than a national level. Building on patent data, Boschma et al. (2015) and Rigby (2015) show that technological relatedness has driven the technological diversification of US metropolitan areas. Mewes and Broekel (2020) find a similar effect for the technological diversification of German labor-market regions.

This brief overview shows comprehensive empirical evidence from different countries of the Global North, all of which confirm relatedness as a common driver of regional diversification. The dominant role of path dependency also implies that a lacking endowment with related capabilities impedes a region's future rounds of diversification. However, if this is the case, how can we explain the immense industrial transformation dynamics several regions in the Global South have undergone in the last decades? While industrialized countries of the triad still head the ranking in terms of economic

complexity, some countries of the Global South are characterized by enormous industrial transformation processes during the last decades. For instance, greatest improvements in the economic complexity ranking between 2005 and 2015 were made by Bahrain, Vietnam, Zambia, Uganda, Panama, Cambodia, and the Philippines, indicating an increasing diversification towards more complex products (The Growth Lab at Harvard University).

Our current knowledge of regional diversification processes, as presented above, has been largely derived from industrialized country experiences, where a strong emphasis on endogenous capabilities is more appropriate. However, it is questionable that the above-mentioned rapid diversification dynamics in regions of the Global South are exclusively the result of a gradual path-dependent process that stems from endogenous structures. For instance, Hidalgo et al. (2007) showed for the period between 1998 and 2000 that countries of the Global South tended to occupy sparsely connected parts of the product space, thereby limiting opportunities to branch into other products. First critical voices, therefore, question if the path-dependent understanding of regional diversification derived from industrialized country contexts provides a sound theoretical framework to explain rapid structural transformation that can be observed in several countries of the Global South (Alonso & Martín, 2019; He et al., 2018).

Research on catching-up processes highlights two important influences that were of key importance for rapid structural transformation of newly industrialized countries and helped to overcome lacking pre-existing capabilities: First, access to foreign assets, such as through the participation in global production networks or the import of technology, have been identified as a crucial factor that enabled the creation of new and often unrelated industrial paths in newly industrialized countries. Second, purposeful state interventions, often discussed under the term developmental state, played an important role for the successful development of new industries (Lee, 2005; Malerba & Nelson, 2011; Yeung, 2009).

In the following, we integrate these two influences – the role of foreign firms and SOEs as a particular form of policy interventions - into the conceptual framework on regional diversification processes in order to appropriately analyze industry entries in Vietnamese regions.

2.1 Foreign firms as pipelines to extraregional sources

Studies in EEG have largely focused on endogenous capabilities as drivers of regional diversification. This isolation of regional entities from extraregional linkages has frequently been criticized (e.g. Binz et al., 2016; Zhu et al., 2017) as it overlooks the influential role of extraregional flows of assets for regional path development. Extraregional linkages such as foreign companies, labor migration, trade, or collaboration allow to tap into new knowledge pools dissimilar from the regional asset base and mobilize other key resources that are crucial to create new paths (Binz et al., 2016). In other words, extraregional influences have the potential to uncouple regions from path-dependent diversification processes and jump to unrelated industries (see for example Zhu et al., 2017). This type of unrelated diversification by adopting extraregional knowledge is described as *transplantation* (Boschma et al., 2017).

Recent studies demonstrate that in particular in regions characterized by an unfavourable regional asset base, extraregional linkages play an important role to overcome endogenous limitations for future rounds of diversification (Isaksen, 2015; Isaksen & Trippl, 2017). Also, in the context of emerging economies in the Global South, extraregional linkages are assigned an influential role for structural transformation by overcoming the lack of necessary endogenous assets (He et al., 2018; Zhu et al., 2017). *Transplantation* has been highlighted as a common diversification type of regions in the Global South that follow catching-up strategies (Boschma et al., 2017). Research on global production networks has shown, especially for East and Southeast Asian regions, how the integration into the global economy has contributed to the introduction of new economic activities (e.g. Yeung, 2009).

Among different forms of extraregional linkages the role of foreign firms has been outlined as particularly influential for structural change (Elekes et al., 2019). The regional stock of foreign firms

can affect how regions diversify in a direct and indirect way. As subsidiaries of foreign firms are integrated into a transnational corporate network, they are able to access capabilities and resources that are not available in the host region (Aslesen et al., 2017) . The access to this organizational global pipeline allows entities of foreign firms to diversify into activities which are not supported by the existing regional capabilities (Elekes et al., 2019).

Apart from being direct agents of structural change, the presence of foreign firms may affect regional diversification indirectly via knowledge spillovers to the host region. Research on the effects of multinational enterprises and foreign direct investment on host regions shows that knowledge spillovers can occur via demonstration and competition effects (Görg & Greenaway, 2004), labor mobility (Driffield & Taylor, 2000), as well as the establishment of localized forward and backward linkages (Yeung et al., 2006). Through these channels, the regional stock of foreign firms can contribute indirectly to diversification processes in the host region via domestic companies that exploit the extraregional knowledge.

In sum, the presence of foreign firms is expected to increase both directly and indirectly opportunities for path creation. Through access to extraregional capabilities, it can facilitate unrelated diversification.

2.2 Policy interventions through state-owned enterprises

Explanations of the successful catching-up processes particularly of East Asian economies have highlighted the influential role purposeful state interventions played in facilitating rapid structural transformation. One widely proliferated expression of state-led development interventions in economies of the Global South are SOEs (Nem Singh & Chen, 2018; Trebilcock, 2019). What particular implications does the presence of SOEs as a particular form of policy intervention have for regional diversification? An explanation how SOEs may affect regional diversification processes needs to differentiate between direct and indirect effects.

On the one hand, existing literature argues that SOEs are more capable to introduce new regional paths (Zhu et al., 2018). SOEs do not only follow business purposes, but are often also deployed by states to promote regional development in peripheral regions and invest in industries that would not emerge due to high risks and the unwillingness of private investors (Nem Singh & Chen, 2018; Zhu et al., 2018). Compared to private companies, efficiency and profitability pressures are expected to shape SOEs' diversification decisions to a lesser degree. Advantages such as preferential access to key assets like credits reduce these pressures and allow to invest into new activities which do not inevitably have to build on existing activities (Zhu et al., 2018). For instance, Zhu et al. (2018) show that SOEs tend to drive unrelated diversification in structurally weak regions in West China, possibly reflecting China's 'Western Development' policy objective. On the other hand, a high regional presence of SOEs reflects a pro-SOE orientation of regional institutions (Nguyen et al., 2013; Nguyen & Revilla Diez, 2017) which can indirectly influence how regions diversify. Granting SOEs preferential access to critical resources like funding, land, and tenders discriminates private enterprises and can cause a crowding-out effect of the private sector (Nguyen et al., 2013; Ramirez & Tan, 2004). The regional presence of SOEs is, thus, expected to hinder private sector development and therefore indirectly hamper industry entries in the region.

Summing up, the direction of the effect caused by the presence of SOEs is not straightforward due to contradictory direct and indirect effects. It rather depends on the policy objectives as well as the degree to which regional institutions' SOE-orientation discriminates private sector development.

2.3 Vietnam´s Economic Development since Doi Moi

As noted above, Vietnam represents a case for a lower-middle income economy in the Global South that has experienced an enormous industrial transformation process during the last decades despite unfavourable asset endowments. E.g. at the beginning of the 1980s, the agricultural sector accounted for more than 80 % of the national income (Anh et al., 2016). However, since the introduction of liberal, market-friendly reforms (*Doi Moi*) in 1986, Vietnam´s economy grew rapidly. Between 1986 and 2019, Vietnam´s GDP per capita increased from 422 to 2,700 USD, which equals a compound annual growth rate of almost 8 % (World Bank, 2020). Moreover, Vietnam's economy has undergone a structural change from agriculture to secondary and tertiary industries (Anh et al., 2016). For instance, while in 2002 almost half of the exports were primary goods, Vietnam's export structure in 2012 was characterized by various new industrial products such as machinery parts, phones, or plastic products with primary goods accounting for less than one-fifth (Revilla Diez, 2016).

Vietnam's integration into the global economy reflected by the influx of foreign capital and an immense increase of exports has been influential for Vietnam's economic evolution (Revilla Diez, 2016). The fact that Vietnam´s FDI Stock equalled 62 % of its GDP in 2019 underlines the importance of external forces for its economy (UNCTAD, 2020). Even though Vietnam achieved a remarkable transition from a formerly socialist to a partly liberalized economy, its socialist heritage and the dominant role of the state is still evident (Revilla Diez, 2016). Despite the fact that the share of enterprises which are owned by the state has decreased from 13 % in 2000 to less than 1 % in 2016 (General Statistics Office of Vietnam, 2017), SOEs still occupy strategic sectors such as communication, transportation, banking, and the oil- and gas sector. SOEs enjoy privileged treatment, such as access to government-guaranteed credits, land, or export quotas. This privileged treatment discriminates private sector development as private enterprises face difficulties in receiving financing or the access to new skills and technology (Nguyen et al., 2013; Revilla Diez, 2016).

Thus, Vietnam serves as an interesting example not only to investigate regional diversification processes within a Global South context, but also for studying the role of external influences and policy interventions through SOEs for regional diversification.

3 Data and Methods

3.1 Measuring Regional Diversification

In order to measure regional diversification processes in Vietnam, we use the Vietnamese firm census from 2006 to 2015 on the provincial level. The firm census is collected annually by the General Statistics Office and includes all firms with at least ten employees and a randomly selected sample of firms with less than ten employees (General Statistics Office of Vietnam, 2017). The census provides information on the province the firm operates in, its type of ownership, revenues as well as the main and second activity. Vietnam consists of 63 provinces. Economic activities are classified according to Vietnam´s Standard Industrial Classification (VSIC) on a four-digit level which strongly equals the ISIC classification. At the four-digit level, the VSIC differentiates between 286 industries.

Following a common approach for studying regional diversification (Cortinovis et al., 2017; Mewes & Broekel, 2020), we split the census into five-year periods (2006 – 2010; 2011 – 2015). This enables us to better understand the temporal dimension behind regional diversification in Vietnam. In order to detect regional diversification processes, we construct a binary dependent variable *Entry*. Following Mewes and Broekel's (2020) concerns, we do not use the location quotient (LQ) as a criterion to identify industry entries, as it is a relative measure, which means that the prominence of industries can artificially inflate when industries in other regions decrease. More importantly, as a measure of specialization the LQ is rather suitable to grasp later stages of regional industrial path development (i.e. industry clusters) or industries that are completely new to the Vietnamese context. For instance, industries that already

concentrate in Vietnamese agglomerations and just recently spread to peripheral provinces would be overlooked. In order to capture these dynamics, we follow He et al. (2018) and Mewes and Broekel (2020) and calculate a more direct industry entry measure by assigning a value of 1 to the binary *Entry* variable if no firm operates in industry *i* in region *r* at time *t* and if at least one firm enters in the subsequent period *t*+1 industry *i* in region *r*. For any other scenarios, we assign the value 0 to the *Entry* variable.

3.2. Explanatory Variables

Relatedness Density

Building on the conceptual considerations of path-dependent diversification processes (see section 2), we include a relatedness density-variable (Hidalgo et al., 2007) in order to analyze to what extent diversification processes in Vietnamese regions are driven by existing related structures. Relatedness density measures the fit of an industry to a region's industrial portfolio.

To construct the relatedness density variable, in a first step, we measure the relatedness between each pair of industries. Common approaches rely on the spatial co-occurrence (Hidalgo et al., 2007) or the co-occurrence in organizational entities (Neffke et al., 2011). We follow the latter approach on the firm-level as it has been claimed that the spatial co-occurrence approach „only measures relatedness indirectly and remains agnostic about the exact source of relatedness causing industries to co-locate" (Content & Frenken, 2016, p. 2108). We make use of the four-digit VSIC code of the firms' main and second activities to count the number of times industries co-occur at the firm-level. If two industries are often found to co-exist on a firm-level, it is likely that both industries rely on related capabilities. Based on the co-occurrences of industries, the cosine similarity measures the relatedness between every industry pair (see also Breschi et al., 2003; Mewes & Broekel, 2020). In a second step, we detect regions' industrial portfolios, defined by the presence of industries.

Building on both inputs, we set up the relatedness density equation following Hidalgo et al. (2007) as follows:

$$Relatedness\ Density_{i,r} = \frac{\sum_m \chi_m \ \rho_{i,m}}{\sum_m \rho_{i,m}} \ \text{x} \ 100$$

In this equation, $\rho_{i,m}$ specifies the relatedness between industry *i* and *m*. χ_m indicates the existence (=1) or absence (=0) of industry *m* within the regional industrial portfolio. The equation yields a 63 x 286 matrix indicating the relatedness density for every of the 286 industries in all 63 Vietnamese provinces.

Foreign-Invested Enterprises

As stated in section 2.1, FIEs can serve as agents of change both directly via diversifying into new activities as well as indirectly via knowledge spillovers to the host region. Thus, we include the regional dominance of FIEs as the second crucial explanatory variable. The FIE dominance is approximated by calculating the revenue generated by FIEs as a share of the total revenue generated in region *r* at time *t*. By estimating the revenue share instead of the number of enterprises, we follow the approach introduced by He et al. (2018). A large FIE like Samsung generates a substantial share of a province´s revenue while it is only one firm among many. Considering solely the number of firms would therefore neglect the importance of FIEs. The revenue share is generated from the Vietnam firm census of the respective year. The variable can be formalized as follows:

$$FIE_{r,t} = \frac{\sum \ FIE\ Revenue_{r,t}}{\sum \ Total\ Revenue_{r,t}}$$

State-Owned Enterprises

Analog to the FIE variable, the focus variable on SOEs approximates the regional dominance of SOEs. Again, the revenue of SOEs as a share of the total revenue generated in region *r* at time *t* is calculated in order to account for the size of SOEs. The variable can be defined as follows:

$$SOE_{r,t} = \frac{\sum SOE\ Revenue_{r,t}}{\sum Total\ Revenue_{r,t}}$$

Control Variables

In addition to the explanatory variables that stand in the center of this study, we control for a number of regional conditions at time *t* that previous research has identified as important determinants of regional diversification. We include *population* (log) in order to control for different sizes of provinces. Because diverse regions with a broad industrial portfolio have more opportunities to diversify into new economic activities (Hidalgo et al., 2007) we include an *industrial portfolio* variable defined by the number of four-digit VSIC codes that exist in a province at time *t*. Moreover, regional diversification depends on the level of economic development (Petralia et al., 2017). We include the provincial *GDP per capita* to control for this effect. All variables were obtained from the General Statistical Office of Vietnam (General Statistical Office of Vietnam, 2019).

3.3. The Empirical Model

We reduce the sample to all observations where a new industry entry is potentially possible. The sample therefore includes all cases where the industry *i* is absent from the industrial portfolio in region *r* at time *t*, but could enter the region in time *t*+5. In order to estimate the likelihood of an industry entry, applying a logit regression is appropriate. We set up the baseline model as follows:

$$\begin{aligned} Entry_{i,r,t+5} = {} & \beta_0 + \beta_1\, Density_{i,r,t} + \beta_2\, FIE_{r,t} + \beta_3\, SOE_{r,t} + \beta_4\, (Density_{i,r,t} \times FIE_{r,t}) \\ & + \beta_5\, (Density_{i,r,t} \times SOE_{r,t}) + \beta_6\, GDPcapita_{r,t} + \beta_7 \log(Population)_{r,t} \\ & + \beta_8\, Industrial\ Portfolio_{r,t} + \varepsilon_{i,r,t} \end{aligned}$$

The binary dependent variable $Entry_{i,r,t+5}$ indicates the probability of a new industry *i* in region *r* within the two five-year periods (2006 – 2010, 2011 – 2015). Besides simply estimating the isolated effects of the focus variables on the dependent variable, we introduce interaction terms to understand whether the regional dominance of SOEs and FIEs moderate or amplify the role of relatedness for new industry entries. Accordingly, we add the interaction terms $Density_{i,r,t} \times SOE_{r,t}$ and $Density_{i,r,t} \times FIE_{r,t}$ into the model.

4 Results

Between 2006 and 2015, out of 21,365 possible industry entries across Vietnamese regions, 3,633 industry entries were realized which is equal to an entry rate of 17 % (see Table A1). In the European context, Cortinovis et al. (2017) estimated that between 2004 and 2012 1 % of all possible industry entries were realized. The relatively high entry rate in Vietnam therefore underlines the enormous economic dynamics the Southeast Asian country experienced. As shown in map A of Fig. 1, provinces with the highest numbers of industry entries concentrate in proximity to the economic centers Hanoi and Ho Chi Minh City (HCMC). While provinces such as Ba Rịa - Vung Tau in the east of HCMC or Hoa Binh in the west of Hanoi experienced an enormous expansion in their regional industrial portfolios, Hanoi and HCMC recorded the lowest realized entries among all Vietnamese provinces. This is due to the fact that Hanoi and HCMC were the most diversified provinces in 2006. While other regions could still expand and diversify their regional industrial portfolio, Hanoi and HCMC already hosted many of the economic sectors on a 4-digit level. Thus, fewer industries could enter in these regions as they were

already present. While the rapidly developing regions around the economic centers experienced the most industry entries, rural areas which are still dominated by agricultural activities such as the mountains provinces in the Northwest, the central Highlands, and the Mekong Delta expanded their regional industrial portfolios to a lesser extent. The average relatedness density of these entries (map B in Fig. 1) offers a comparable spatial pattern, implying a correlation between both variables. Interestingly, the few entries in the economic centers seem to be rather unrelated, while more related entries emerged in the neighboring provinces of Hanoi and HCMC. The rural provinces in the North and in the Mekong Delta which experienced less industry entries are characterized by lower average relatedness density scores hinting towards more unrelated diversification.

The spatial representation of the focus variables also provides interesting insights (map C and D in Fig. 1). FIEs primarily operated in and around the economic centers. Multinational enterprises largely concentrated in the Red River Delta and the Southeast (Nguyen & Revilla Diez, 2017). While these two regions are marked by FIEs, the rural and structurally weak regions in the north and in the Mekong Delta are characterized by large revenue shares of SOEs. Furthermore, one can see that the North has generally higher revenue shares of SOEs than the South. This reflects the aforementioned socialist heritage which is still evident in northern Vietnam. Comparing the maps, the presence of FIEs seems to correlate to a certain degree with the amount of realized industry entries, while the presence of SOEs suggests a negative correlation with realized industry entries.

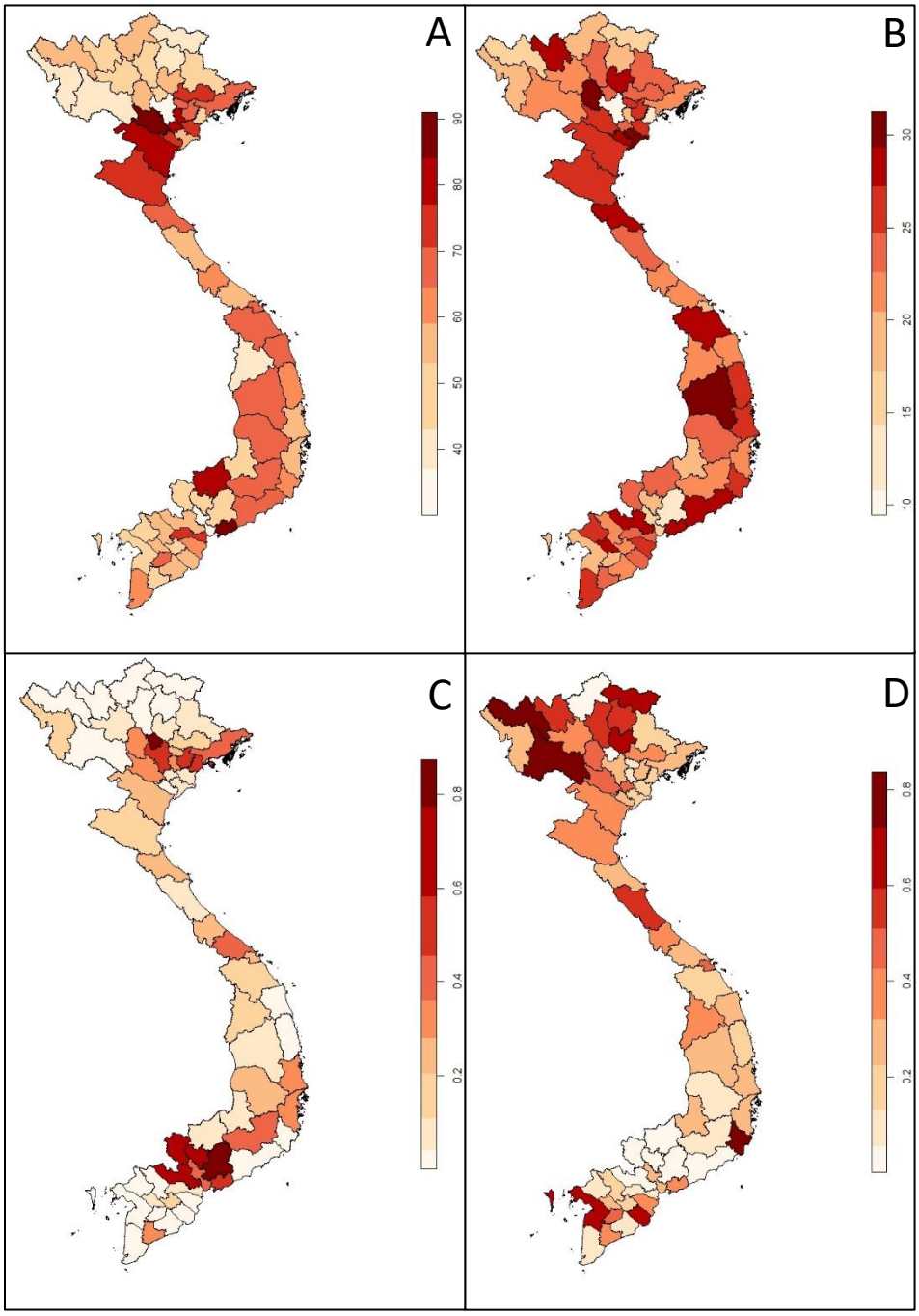

Figure 1: A: Realized industry entries 2006 – 2015; B: Average relatedness density of realized entries 2006 – 2015; C: Share of revenue generated by FIEs in 2006; D: Share of revenue generated by SOEs in 2006.

The results of the logit regression analysis for the first (2006 – 2010) and second period (2011 – 2015) are reported in table 1. We calculated four different models for each period by gradually adding interaction terms.

In both periods and in all models, the variable *Relatedness Density* is significantly positive. Industries are more likely to develop in a region when they are related to pre-existing structures. It indicates that diversification processes of Vietnamese regions are path-dependent. This finding complies with the broad empirical evidence gained from case studies in a Global North context confirming relatedness as a common driver of regional diversification (Boschma et al., 2013; Essletzbichler, 2015; Mewes &

Broekel, 2020; Neffke et al., 2011). It also strengthens the hitherto scarce empirical evidence from a Global South context where the path-dependency of regional diversification was recently identified for regions in Brazil, China, and Mexico despite tremendous structural transformation (Alonso & Martín, 2019; He et al., 2018).

Table 1: Regression Results

	First period (2006 - 2010)				*Second period (2011 - 2015)*			
	Dependent Variable: Entry				Dependent Variable: Entry			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Relatedness Density	0.011***	0.013***	0.010***	0.014***	0.010***	0.009***	0.010***	0.011***
	(0.001)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)	(0.001)	(0.002)
Share of FIE Revenue	-0.248	-0.034	-0.246	-0.017	0.075	0.050	0.077	0.091
	(0.151)	(0.171)	(0.151)	(0.175)	(0.194)	(0.231)	(0.194)	(0.236)
Share of SOE Revenue	-0.183	-0.182	-0.241	-0.130	0.239	0.239	0.399*	0.405*
	(0.123)	(0.123)	(0.157)	(0.164)	(0.169)	(0.169)	(0.236)	(0.243)
Density x FIE		-0.011**		-0.012**		0.001		-0.0005
		(0.004)		(0.005)		(0.004)		(0.004)
Density x SOE			0.003	-0.003			-0.005	-0.006
			(0.005)	(0.006)			(0.006)	(0.006)
GDP per capita	0.00005***	0.00005***	0.00005***	0.00005***	0.0001**	0.0001**	0.0001**	0.0001**
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00002)	(0.00002)	(0.00002)	(0.00002)
Population	0.136**	0.136**	0.136**	0.136**	0.042	0.042	0.042	0.042
	(0.066)	(0.066)	(0.066)	(0.066)	(0.097)	(0.097)	(0.097)	(0.097)
Ind. portfolio	0.008***	0.008***	0.008***	0.008***	0.010***	0.010***	0.010***	0.010***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Constant	-4.066***	-4.098***	-4.047***	-4.117***	-4.082***	-4.079***	-4.106***	-4.108***
	(0.873)	(0.874)	(0.874)	(0.874	(1.221)	(1.221)	(1.221)	(1.221)
Observations	11,821	11,821	11,821	11,821	9,544	9,544	9,544	9,544
Log Likelihood	-5,907.126	-5,903.867	-5,906.951	-5,903.755	-3,546.041	-3,546.022	-3,545.593	-3,545.587
Akaike Inf. Crit.	11,828.250	11,823.740	11,829.900	11,825.510	7,106.083	7,108.044	7,107.185	7,109.173
Note:								*p<0.1; **p<0.05; ***p<0.01

Apart from endogenous capabilities, we considered, as argued in section 2, the role of external influences and policy interventions through SOEs for regional diversification in our regression models. We find that the variable *Share of FIE Revenue* has no significant effect on industry entries over the complete period of time. In other words, the regional presence of foreign firms does not systematically influence the likelihood of new industry entries in Vietnamese regions. Interestingly, the interaction term *Density x FIE* is significantly negative in the first period. Accordingly, the positive impact of relatedness density on industry entries decreased with an increasing regional presence of foreign firms, thus, facilitating more unrelated diversification between 2006 and 2010. The finding confirms our assumption that foreign firms may serve as pipelines to extraregional capabilities and hence have the potential to

uncouple regions from path-dependent diversification processes (see also Elekes et al., 2019; Zhu et al., 2017). The access to extraregional linkages seems to play an influential role particularly for driving structural transformation in economies of the Global South, as two recent studies on Chinese regions show (He et al., 2018; Zhu et al., 2017). Our findings confirm this relationship between foreign firms and unrelated diversification for the Vietnamese context in the first period. However, the interaction effect of the regional presence of foreign firms on relatedness density vanishes in the second period of the analysis, indicating that foreign linkages do not contribute to unrelated diversification at any time.

We find the variable *Share of SOE Revenue* to be insignificant in the first period. The regional presence of SOEs did not affect the probability of new industry entries in Vietnamese regions. In the second period, we find a significantly positive effect of the variable *Share of SOE Revenue* on industry entries. This result suggests that in the second period SOEs' potential role as a developmental tool tends to outweigh the hindering effect stemming from regional institutions' SOE-orientation on private sector development (see section 2.2). A similar observation of SOEs acting as new industry creators has been made in a study on Chinese regions (Zhu et al., 2018). Surprisingly, the interaction term *Density x SOE* is insignificant in both periods. Accordingly, the regional presence of SOEs neither strengthens the role of relatedness, nor does it foster unrelated diversification. As already outlined in section 2.2, these findings can be the result of contradictory direct and indirect effects of the regional presence of SOEs. While existing research has argued that SOEs are more capable to introduce new unrelated regional paths (Zhu et al., 2018), a pro-SOE orientation of regions can also hinder private sector activities (Nguyen et al., 2013; Nguyen & Revilla Diez, 2017). The findings on SOEs differ from existing empirical evidence on diversification processes in Chinese regions, where SOEs were found to have a positive effect on unrelated diversification in peripheral regions (Zhu et al., 2018).

5 Conclusion

Our current understanding of regional diversification has a strong focus on endogenous capabilities, emphasizing that the industrial evolution of regions follows a path-dependent trajectory (Boschma & Frenken, 2011). As this knowledge has been largely derived from industrialized country experiences, it is an outstanding issue if it also provides a sound theoretical framework to explain the rapid structural transformations several regions in the Global South have undergone in the last decades. By analyzing industry entries in Vietnamese regions, this paper aimed to test the contemporary understanding of regional diversification in a different context beyond the usual suspects. We adapted the study to the context-specific conditions and integrated FIEs and SOEs into the analysis.

The study reveals that Vietnamese regions have experienced considerable industrial dynamics within the observed period of time: About 17 % of all potential industry entries took place. We find that the relatedness between the new industry and the existing regional industrial portfolio was a significant factor that drove these dynamics. The finding thus supports the predominant understanding of regional diversification as a path-dependent process (e.g. Boschma et al., 2013; Neffke et al., 2011). This similar effect does by no means make this study redundant against the background of the broad empirical evidence that already exists from the Global North. It rather provides an important contribution to the EEG-literature by corroborating our understanding of regional diversification as related diversification also holds true in a different setting beyond the usual suspects.

However, the analysis also highlights that endogenous capabilities are not the only factor influencing regional diversification. The results show that foreign firms played an influential role for the diversification of Vietnamese regions. The regional presence of foreign firms facilitated regions to diversify into unrelated industries in the first period. This indicates that *transplantation* (Boschma et al., 2017), i.e. unrelated diversification by adopting extraregional knowledge, was one type of diversification that shaped the industrial evolution of Vietnamese regions. It suggests that foreign firms served as agents of change and provided access to extraregional capabilities. For Vietnamese regions,

this form of extraregional linkages, thus, allowed to uncouple from regional path dependency and jump to unrelated industries. From a conceptual perspective, this finding meets recent calls for studying the role of extraregional influences (e.g. Binz et al., 2016; Hassink et al., 2019; Isaksen & Trippl, 2017). It demonstrates why it is essential to consider the influence of extraregional linkages and actors in analyses of regional diversification. Especially in a Global South context, where various regions diversified their economies to a considerable extent despite starting from an unfavourable regional asset base, a mere focus on endogenous capabilities would not be able to explain these dynamics.

Furthermore, the analysis reveals that the presence of SOEs facilitated new industry entries in Vietnamese regions in the second period. This indicates that SOEs can hold the potential to be applied as a developmental tool to accelerate structural change as also shown in other catching-up contexts such as China (Zhu et al., 2018) or Singapore and South Korea a few decades ago (Huff, 1995). From a conceptual perspective, this result echoes the need to consider multiple actors in analyses on regional diversification and path creation (Hassink et al., 2019). In order to improve the understanding of the role of SOEs for regional diversification, future research should unpack the agency that underlies these regional dynamics thereby learning about the actions taken and intentions pursuit by SOEs.

Summing up, the study has contributed to research on regional diversification by re-evaluating the wider validity of the path-dependent conceptualization of regional diversification in a Global South context. While the role of relatedness holds true for Vietnam, the study highlights that only by adapting the analysis to context-specific conditions are we able to understand how regional diversification takes place across different settings. These insights also provide a valuable source to complement our existing knowledge on regional diversification.

Apart from calling for further case studies from other countries of the Global South, the paper opens a number of directions for future research. First, while this study focused on the presence of foreign firms, other international influences exist, e.g. trade, migration, or foreign aid. Future research could include these different types of extraregional influences into the analysis and compare how they affect regional diversification. Second, the study has shown that effects of various factors (FIEs, SOEs) on regional diversification are not persistent over time. Revealing the underlying reasons for these time-varying effects is important in order to strengthen our understanding under which conditions what kind of regional diversification mechanisms are in place. This is especially an important issue for dynamic settings. Finally and most importantly, new industry entries are no end in itself. It requires more research that investigates to what extent and under which conditions the identified regional diversification processes have translated into regional economic development. Especially new industry entries resulting from subsidiaries of foreign firms not automatically unfold beneficial regional economic outcomes as research on branch plants, enclaves and global production networks suggests.

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Appendix

Table A1: Descriptive statistics

Variable	Level	N	Min.	Max.	Mean	SD
Entry	Industry	21,365	0	1	0.17	-
Relatedness Density	Industry	21,365	0	100	19.7	-
Share of FIE Revenue	Region	21,365	0	0.89	0.18	0.21
Share of SOE Revenue	Region	21,365	0	0.91	0.25	0.22
Population	Region	21,365	290,000	7,498,400	1,149,4497	708,285
Industrial Portfolio	Region	21,365	35	262	104.1	38.63
GDP per capita	Region	21,365	341.54	13,811.44	957.33	1350.38