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

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

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Abstract

Hitherto, the path-dependent understanding of regional diversification in Evolutionary Economic Geography (EEG) has drawn largely on insights into industrialized countries. However, in the past few decades several regions in the Global South have undergone rapid structural transformations despite starting out with unfavourable regional asset bases. This raises the question as to whether the strong emphasis on endogenous capabilities in EEG also provides a sound theoretical framework for explaining these tremendous diversification dynamics. This paper therefore aims to re-evaluate the wider validity of the path-dependent conceptualization of regional diversification in the context of a lower-middle income economy. To this end, 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-owned 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-owned firms allowed Vietnamese regions to break away from path dependency and diversify 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, Vietnam
1 Introduction

Economic diversification through the development of new industries and products is perceived as fundamental for long-term economic success, for both countries and regions (Contini & Frenken, 2016; Hidalgo et al., 2007). The way that new industries evolve in regions and the way regions diversify over time have therefore been key topics in Economic Geography in recent decades. Evolutionary Economic Geography (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 of 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).

The dominant role of path dependency also implies that an inadequate 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 that several regions in the Global South have undergone in the past few decades? This path-dependent conceptualization of regional diversification has so far largely drawn upon insights into industrialized countries in Europe and North America. This is why critical voices have begun to question whether related diversification provides a sound theoretical framework for explaining the massive process of productive change that several economies in the Global South have undergone (Alonso & Martin, 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 and North America in order to broaden our understanding of regional diversification in distinct settings. Recently, first endeavours have complemented insights gained from regional diversification processes in upper-middle income and BRIC economies (Alonso & Martin, 2019; He et al., 2018; Zhu et al., 2017).

However, according to the economic complexity ranking, between 2005 and 2015 the most substantial structural change 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, there are no studies that have 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 filling this significant gap by analysing the process of regional diversification in Vietnam, a lower-middle income economy, 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 from 107th place 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-owned enterprises (FOEs) and increasing integration into global production networks. At the same time, the state has remained an influential economic actor in the Vietnamese economy and exhibits its power mainly through state-owned enterprises (SOEs) (Nguyen & Revilla Diez, 2017; Revilla Diez, 2016).

The application of concepts in new contexts only permits to refine these concepts when taking into account context-specific factors under which generalities such as regional branching functions (Bathelt et al., 2017; Gong & Hassink, 2020). Therefore, we are sensitive to the above-mentioned particularities of the Vietnamese context and add the role of FOEs and SOEs to the conceptualization of regional diversification processes. This will help to extend our knowledge of regional diversification largely drawn from the experiences made by advanced industrial economies and to re-evaluate the wider validity of the path-dependent conceptualization of regional diversification in a different context in two ways.

First, EEG has been criticized for placing 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 latecomer regions that have meanwhile diversified their economies to a considerable extent despite starting out with an unfavourable regional asset base. Recent research
suggested that these local constraints can be overcome by means of access to extra-regional linkages, such as trade or FOEs (Alonso & Martin, 2019; Hassink et al., 2019; He et al., 2018; Isaksen & Tripl, 2017). Second, the presence of SOEs can certainly also shape regional diversification. SOEs can reduce the role of relatedness for regional diversification as they are affected to a lesser degree by pressure regarding short-term profitability and efficiency, but may follow long-term developmental goals deemed strategic by the government (Zhu et al., 2019).

Our findings show that relatedness also matters for regional diversification in the Vietnamese context. However, FOEs act as a global pipeline for extra-regional assets, thereby reducing the influence of related regional industrial structures on the creation of new paths. Besides contributing to the understanding of regional diversification processes beyond case studies in the Global North by presenting a case study on Vietnam, a lower-middle income economy, the study adds to the current debate surrounding the impact of extra-regional actors on regional diversification (Boschma, 2017; Hassink et al., 2019).

The paper proceeds as follows: Section 2 reviews existing EEG studies on regional diversification and elaborates on the role of FOEs and SOEs. 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 case studies in the Global North

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 in 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 spin-offs, firm diversification, labour 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 is thus characterized by a path-dependent nature.

Taking these ideas as a starting point, a number of studies have been conducted during the past decade to analyse the extent to which 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) find that a new industry is more likely to emerge in regions already possessing 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 is 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 at a regional rather than a national level. On the basis of patent data, Boschma et al. (2015) and Rigby (2015) show that technological relatedness has driven the technological diversification of US metropolitan areas. This brief overview shows empirical evidence from different countries, all of which confirm relatedness as a common driver of regional diversification.

The empirical overview also reflects that the conceptualization of regional diversification as a regional branching process has been derived largely from experiences made by industrialized countries, thereby neglecting the dynamics and realities of large parts of the world. As outlined in the introduction, especially low-income and lower-middle income economies, such as Cambodia, the Philippines,
In fact, besides the largely empirical omission of case studies beyond countries from the Global North, the discrepancy outlined above is linked to a number of other points of critique that have recently been raised in connection with the EEG diversification conceptualization. First, studies in EEG have largely focused on endogenous capabilities as drivers of regional diversification. This isolation of regional entities from extra-regional linkages has frequently been criticized (e.g. Binz et al., 2016; Chen & Hassink, 2020; Zhu et al., 2017). It disregards the influential role of extra-regional asset flows for regional path development especially in contexts with insufficient endogenous assets for future rounds of diversification (Isaksen, 2015; Isaksen & Tripl, 2017; MacKinnon et al., 2019). He et al. (2018, p. 176) argue that a strong emphasis on endogenous assets “is reasonable for mature and developed economies, which are supported by knowledge intensive sectors with good market systems. However, for transitional economies, exogenous factors often play crucial roles for regional industrial development.” Second, regional diversification has generally been understood as a process that is driven by private firms. Non-firm actors, such as policy actors, the state (Dawley et al., 2015) or universities (Tanner, 2014), as well as non-private firms have not received sufficient attention.

These two points of critique are closely connected to the objective of this study, as research on catching-up processes highlights two important factors that were of key importance for the rapid structural transformation of newly industrialized countries and helped to overcome the lack of pre-existing capabilities. First, access to foreign assets, for example via participation in global production networks or the importation of technology, has been identified as a crucial factor facilitating the creation of new and often unrelated industrial paths in newly industrialized countries. Second, purposeful state interventions, often discussed under the term developmental state, have played an important role in the successful development of new industries (Lee, 2005; Malerba & Nelson, 2011; Yeung, 2009).

These insights underline the need to adapt the analysis to the different contexts in which industrial transformation processes occur in order to be able to fully understand regional diversification processes beyond a well-researched Global North context. This aspect goes hand in hand with recent calls for a more sensitive approach to context-specific factors when applying EEG-concepts to different countries (Bathelt et al., 2017; Boschma, 2017; Gong & Hassink, 2020). Gong and Hassink argue that “empirical regularities identified by evolutionary scholars [such as regional branching] have to be confronted with distinct local contexts and particularities in order to be able to identify the fundamental causal mechanisms” (2020, p. 484). Boschma (2017), one of the main proponents of EEG, also calls for more geographical wisdom in future studies to reveal how place-specific characteristics affect the role of relatedness. In the following we therefore integrate the two aforementioned factors – the role of FOEs and SOEs as vehicles of state intervention - into the conceptual framework on regional diversification processes in order to appropriately analyse industry entries in Vietnamese regions and to confront the role of relatedness (as the empirical regularity) with these distinct context-specific factors.
2.1 Foreign-owned firms as pipelines to extra-regional sources

Extra-regional linkages, such as FOEs, labour migration, trade or collaboration, make it possible to tap into new knowledge pools dissimilar from the regional asset base and to mobilize other key resources that are crucial for creating new paths (Binz et al., 2016; Breul et al., 2021). In other words, extra-regional influences have the potential to enable regions to break away from path-dependent diversification processes and jump to unrelated industries (see, for example, Zhu et al., 2017). This type of unrelated diversification by adopting extra-regional knowledge is described as transplantation (Boschma et al., 2017).

Recent studies demonstrate that especially in regions characterized by an unfavourable regional asset base, extra-regional linkages play an important role in overcoming endogenous limitations for future rounds of diversification (Isaksen, 2015; Isaksen & Tripl, 2017). Moreover, in the context of emerging economies, extra-regional linkages are regarded as an influential factor in structural transformation as they counteract the lack of necessary endogenous assets (He et al., 2018; Zhu et al., 2017). Transplantation has been highlighted as a common diversification type in regions pursuing catch-up strategies (Boschma et al., 2017). Research on global production networks has shown, especially for East and Southeast Asian regions1, how integration into the global economy has contributed to the introduction of new economic activities (e.g. Yeung, 2009).

Of the different forms of extra-regional linkages, the role played by FOEs has been outlined as particularly influential for structural change (Elekes et al., 2019). The regional stock of FOEs can affect how regions diversify both directly and indirectly. As subsidiaries of FOEs 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). Access to this organizational global pipeline allows entities of FOEs 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 FOEs 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), labour 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 FOEs can contribute indirectly to diversification processes in the host region via domestic companies exploiting the extra-regional knowledge.

In sum, the presence of FOEs is expected to increase opportunities for path creation both directly and indirectly. They can facilitate unrelated diversification by providing access to extra-regional capabilities.

2.2 State-owned enterprises

Explanations of successful catch-up processes, particularly in East Asian economies, have highlighted the influential role played by purposeful state interventions in facilitating rapid structural transformation. In this context, SOEs are a widely used vehicle of state-led development interventions (Nem Singh & Chen, 2018; Trebilcock, 2019). While recent contributions have incorporated the crucial role of the state in path creation through its role as facilitator and regulator (e.g. industrial policies, creation of niche markets, infrastructure) (Dawley et al., 2015), SOEs indicate another role played by the state, which has not yet been sufficiently addressed – its role as a producer2. In this role, SOEs can serve as a vehicle of

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1 Exceptions are Japan and South Korea, where diversification was primarily driven by a developmental state without an originally strong presence of foreign firms.

2 See Horner (2017) for a similar discussion in the context of global value chain/production network research.
state intervention, enabling states to pursue developmental objectives. Among other things, SOEs are deployed by states to promote regional development in peripheral regions and invest in sensitive as well as strategic industries that would not emerge due to high risks and the unwillingness of private investors (Nem Singh & Chen, 2018; Trebilcock, 2019).

Although in EEG diversification has been largely understood as a firm-driven process, SOEs constitute an organisational form that differs from EEG’s focus on private firms. First, SOEs do not pursue solely business purposes as outlined in the preceding paragraph. Non-business objectives, such as developmental policies, may require SOEs to introduce new industries to remote regions, as seen for instance in China’s “Western Development” policy (Zhu et al., 2019). Second, the core assumption about firm diversification in EEG refers to a context of market competition. Private firms will tend to diversify into activities that are related to the firm-specific routines in order to reduce costs (e.g. switching costs) and the risk of failure (Boschma & Frenken, 2011). Compared to private companies, efficiency and profitability pressures are expected to shape the diversification decisions made by SOEs to a lesser degree. This is reflected for instance in one of the reasons for establishing SOEs - to develop industries at locations where they would not emerge due to high risks and the unwillingness of private investors (Nem Singh & Chen, 2018). Moreover, Zhu et al. (2019, p. 73) argue that “SOEs may be more capable to diversify into new industries since they enjoy institutional advantages such as preferential access to favourable policies, business information, and government subsidies”. These advantages can lower the costs of introducing unrelated industries. For instance, Zhu et al. (2019) show that SOEs tend to drive unrelated diversification in structurally weak regions in western China, possibly reflecting China’s ‘Western Development’ policy objective.

Summing up, the presence of SOEs is expected to support new industry entries to regions. The favourable access to critical resources and the partly non-business objectives could foster regional diversification into unrelated industries.

### 2.3 Vietnam’s economic development since Doi Moi

As noted above, Vietnam is an example of a lower-middle income economy that has undergone an enormous industrial transformation process during the past few decades despite unfavourable asset endowments. At the beginning of the 1980s, for example, Vietnam’s agricultural sector accounted for more than 80 % of its national income (Anh et al., 2016). However, since the introduction of liberal, market-friendly reforms (Doi Moi) in 1986, Vietnam’s economy has grown 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, in 2012 Vietnam’s export structure was characterized by various new industrial products such as machinery parts, mobile phones and 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 in exports, has been influential for Vietnam’s economic evolution (Revilla Diez, 2016). The fact that Vietnam’s FDI stock made up 62 % of its GDP in 2019 underlines the importance of external forces for its economy (UNCTAD, 2020). Even though Vietnam has achieved a remarkable transition from a formerly socialist to a partly liberalized economy, its socialist heritage and the dominant role of the state are 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 loans, land or export quotas(Nguyen et al., 2013; Revilla Diez, 2016).
Thus, Vietnam serves as an interesting example not only for investigating the regional diversification processes of a lower-middle income economy but also for studying the role of external influences and SOEs as vehicles of state intervention 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 at the provincial level. The firm census is conducted annually by the General Statistics Office and includes all firms with at least ten employees and a randomly selected sample of firms with fewer than ten employees (General Statistics Office of Vietnam, 2017). The census provides information on the province in which the firm operates, the type of firm 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) at the four-digit level, which is very similar to 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*. Taking Mewes and Broekel’s (2020) concerns into consideration, 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 be artificially inflated when industries in other regions decrease. More importantly, as a measure of specialization the LQ is more suitable for detecting 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 are already concentrated in Vietnamese agglomerations and have only recently spread to peripheral provinces would be overlooked. In order to capture these dynamics, we follow He et al. (2018) as well as 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 industry *i* in region *r* in the subsequent period *t*+1. 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 analyse the extent to which diversification processes in Vietnamese regions are driven by existing related structures. Relatedness density measures how closely an industry matches a region’s industrial portfolio.

To construct the relatedness density variable, in a first step we measure the relatedness between every 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 at 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 determine the number of times industries co-occur at firm level. If two industries are often found to co-exist at firm level, it is likely that they rely on related capabilities. Based on the co-occurrence of industries, the cosine similarity measures the relatedness between every industry pair (see
In a second step, we detect regions’ industrial portfolios as defined by the presence of industries.

On the basis of the two inputs, we set up the relatedness density equation following Hidalgo et al. (2007) as follows:

$$\text{Relatedness Density}_{i,r} = \frac{\sum_m \chi_m \cdot \rho_{i,m}}{\sum_m \rho_{i,m}} \times 100$$

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

**Foreign-owned enterprises**

As stated in section 2.1, FOEs can serve as agents of change both directly, via diversification into new activities, as well as indirectly, via knowledge spillovers to the host region. We thus include the regional dominance of FOEs as the second crucial explanatory variable. The FOE dominance is approximated by calculating the revenue generated by FOEs 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 FOE such as Samsung generates a substantial share of a province’s revenue although it is only one firm among many. Considering solely the number of firms would therefore neglect the importance of FOEs. The revenue share is obtained from the Vietnam firm census of the respective year. The variable can be formalized as follows:

$$\text{FOE}_{r,t} = \frac{\sum \text{FOE Revenue}_{r,t}}{\sum \text{Total Revenue}_{r,t}}$$

**State-owned enterprises**

Analogous to the FOE variable, the SOE variable 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 take the size of SOEs into account. The variable can be defined as follows:

$$\text{SOE}_{r,t} = \frac{\sum \text{SOE Revenue}_{r,t}}{\sum \text{Total Revenue}_{r,t}}$$

**Control variables**

In addition to the explanatory variables that are central to this study, we control for a number of regional conditions at time $t$ that have been identified in previous research 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 the 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 in which a new industry entry is potentially possible. The sample therefore includes all cases in which industry $i$ is absent from the industrial portfolio of region $r$
at time $t$, but could enter the region at time $t+5$. A logit regression is suitable to estimate the likelihood of an industry entry. We set up the baseline model as follows:

$$\text{Entry}_{i,r,t+5} = \beta_0 + \beta_1 \text{Density}_{i,r,t} + \beta_2 \text{FOE}_{r,t} + \beta_3 \text{SOE}_{r,t} + \beta_4 (\text{Density}_{i,r,t} \times \text{FOE}_{r,t}) + \beta_5 (\text{Density}_{i,r,t} \times \text{SOE}_{r,t}) + \beta_6 \text{GDPcapita}_{r,t} + \beta_7 \log(\text{Population})_{r,t} + \beta_8 \text{Industrial Portfolio}_{r,t} + \epsilon_{i,r,t}$$

The binary dependent variable $\text{Entry}_{i,r,t+5}$ 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 variables of interest on the dependent variable, we introduce interaction terms to clarify whether the regional dominance of SOEs and FOEs moderates or amplifies the role of relatedness for new industry entries. Accordingly, we add the interaction terms $\text{Density}_{i,r,t} \times \text{SOE}_{r,t}$ and $\text{Density}_{i,r,t} \times \text{FOE}_{r,t}$ to the model.

### 4 Results

Between 2006 and 2015, out of a total 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 comparison, 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 experienced by the Southeast Asian country. As shown in map A of Fig. 1, the provinces with the highest numbers of industry entries are concentrated in proximity to the economic centres of Hanoi and Ho Chi Minh City (HCMC). Whereas provinces such as Ba Ria - Vung Tau to the east of HCMC or Hoa Binh to the west of Hanoi exhibited tremendous expansion in their regional industrial portfolios, Hanoi and HCMC recorded the lowest number of realized entries of all the 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 portfolios, Hanoi and HCMC already hosted many of the economic sectors at the 4-digit level, with very few still left to enter these regions. While the rapidly developing regions around the economic centres saw the most industry entries, rural areas, such as the mountain provinces in the Northwest, the central Highlands, and the Mekong Delta, which are still dominated by agricultural activities, expanded their regional industrial portfolios to a lesser extent. The average relatedness density of these entries (map B in Fig. 1) yields a comparable spatial pattern, implying a correlation between the two variables. Interestingly, the few entries in the economic centres seem to be rather unrelated, while more related entries emerged in the neighbouring provinces of Hanoi and HCMC. The rural provinces in the north and in the Mekong Delta, which experienced fewer industry entries, are characterized by lower average relatedness density scores, suggesting more unrelated diversification.

The spatial representation of the variables of interest also provides interesting insights (maps C and D in Fig. 1). FOEs primarily operate in and around the economic centres. Multinational enterprises are largely concentrated in the Red River Delta and the Southeast (Nguyen & Revilla Diez, 2017). While these two regions are characterized by FOEs, the rural and structurally weak regions in the north and in the Mekong Delta are characterized by large revenue shares of SOEs. Furthermore, it can be seen that the north generally has 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 FOEs seems to correlate to a certain degree with the number of realized industry entries, while the presence of SOEs suggests a negative correlation with realized industry entries.
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. This indicates that the diversification processes of Vietnamese regions are path-dependent. This finding is in line 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 corresponds with findings on Brazil, China and Mexico,
where regional diversification was partly driven by relatedness despite tremendous structural transformation (Alonso & Martin, 2019; He et al., 2018).

### Table 1: Regression results

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<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
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<tr>
<td>Relatedness Density</td>
<td>0.011***</td>
<td>0.013***</td>
</tr>
<tr>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.002)</td>
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<tr>
<td>Share of FIE Revenue</td>
<td>-0.248</td>
<td>-0.034</td>
</tr>
<tr>
<td>(0.151)</td>
<td>(0.171)</td>
<td>(0.151)</td>
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<tr>
<td>Share of SOE Revenue</td>
<td>-0.183</td>
<td>-0.182</td>
</tr>
<tr>
<td>(0.123)</td>
<td>(0.123)</td>
<td>(0.157)</td>
</tr>
<tr>
<td>Density x FIE</td>
<td>-0.011**</td>
<td>-0.012**</td>
</tr>
<tr>
<td>Density x SOE</td>
<td>0.003</td>
<td>-0.003</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>0.00005***</td>
<td>0.00005***</td>
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<tr>
<td>(0.00001)</td>
<td>(0.00001)</td>
<td>(0.00001)</td>
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<tr>
<td>Population</td>
<td>0.136**</td>
<td>0.136**</td>
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<tr>
<td>(0.066)</td>
<td>(0.066)</td>
<td>(0.066)</td>
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<tr>
<td>Ind. portfolio</td>
<td>0.008***</td>
<td>0.008***</td>
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<tr>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
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<tr>
<td>(0.873)</td>
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</tr>
<tr>
<td>Observations</td>
<td>11,821</td>
<td>11,821</td>
</tr>
<tr>
<td>Log Likelihood</td>
<td>-5,907</td>
<td>-5,903</td>
</tr>
<tr>
<td>Note:</td>
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</table>

Besides endogenous capabilities, as argued in section 2 we also take the role of external influences and SOEs for regional diversification into consideration in our regression models. We find that the variable Share of FIE Revenue has no significant effect on industry entries over the entire period under observation. In other words, the presence of FOEs in a Vietnamese region does not systematically influence the likelihood of new industry entries in that region. Interestingly, the interaction term Density x FOE is significantly negative in the first period. Accordingly, the positive impact of the relatedness density on industry entries decreases with an increasing regional presence of FOEs, thus facilitating more unrelated diversification. This finding provides the evidence to support our hypothesis that FOEs may serve as pipelines for extra-regional capabilities, allowing regions to diversify in more unrelated industries (see also Elekes et al., 2019; Zhu et al., 2017) – a diversification type termed transplantation by Boschma et al. (2017). Access to extra-regional linkages seems to play an influential role for driving
structural transformation, as is also found by two recent studies on Chinese regions (He et al., 2018; Zhu et al., 2017). Our findings suggest a similar relationship between FOEs and unrelated diversification for the Vietnamese context in the first period. However, the interaction effect of the regional presence of FOEs on the 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 does 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. A similar observation of SOEs acting as new industry creators has been made in a study on Chinese regions (Zhu et al., 2019). Surprisingly, the interaction term Density x SOE is insignificant in both periods. Contrary to our conceptual considerations, the regional presence of SOEs neither strengthens the role of relatedness nor fosters unrelated diversification. The findings on SOEs differ from existing empirical evidence on diversification processes in Chinese regions, where SOEs are found to have a positive effect on unrelated diversification in peripheral regions (Zhu et al., 2019).

5 Conclusion

Our current understanding of regional diversification focuses strongly on endogenous capabilities, emphasizing that the industrial evolution of regions follows a path-dependent trajectory (Boschma & Frenken, 2011). As this knowledge has largely been derived from experiences made in industrialized countries, it has yet to be confirmed whether it also provides a sound theoretical framework to explain the rapid structural transformations that several regions in lower-middle income economies have undergone in the past few decades. By analysing industry entries in Vietnamese regions, this paper aimed to test the contemporary understanding of regional diversification in a different context beyond case studies in the Global North. We adapted the study to the context-specific conditions and integrated FOEs and SOEs into the analysis.

The study reveals that Vietnamese regions have experienced strong industrial dynamics during the observed period of time: some 17% of all potential industry entries occurred. We find the relatedness between the new industry and the existing regional industrial portfolio to be a significant factor underlying 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 by no means makes this study redundant against the background of the broad empirical evidence already gained from industrialized countries. 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 case studies in the Global North. However, the analysis also highlights that endogenous capabilities are not the only factor influencing regional diversification. The results show that FOEs play an influential role in the diversification of Vietnamese regions. The regional presence of FOEs enabled the regions to diversify into unrelated industries in the first period. This indicates that transplantation (Boschma et al., 2017), i.e. unrelated diversification achieved by adopting extra-regional knowledge, is one type of diversification that shapes the industrial evolution of Vietnamese regions. It suggests that FOEs serve as agents of change and provide access to extra-regional capabilities. This type of extra-regional linkages thus enables Vietnamese regions to break away from regional path dependency and jump to unrelated industries. From a conceptual perspective, this finding meets recent calls for studying the role of extra-regional influences (e.g. Binz et al., 2016; Hassink et al., 2019; Isaksen & Tripl, 2017). It demonstrates why it is essential to consider the influence of extra-regional linkages and actors in analyses of regional diversification. Especially in a context in which regions have diversified their economies to a considerable extent despite starting out 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 have the potential to be used as a developmental tool to accelerate structural change as has also been shown in other catch-up contexts, such as China (Zhu et al., 2019) or Singapore, where key industries were developed with the aid of SOEs a few decades ago (Kanchoochat, 2019). From a conceptual viewpoint, this result echoes the need to take multiple actors into account when analysing regional diversification and path creation (Hassink et al., 2019).

To sum 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 the context of a lower-middle income transition economy. 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 (see also Gong & Hassink, 2020). These insights also provide a valuable source to complement and refine our existing knowledge on regional diversification.

The paper opens up a number of directions for future research. First, while this study focuses on the presence of FOEs, there are other extra-regional influences such as trade, migration or foreign aid that could affect the trajectory of regional diversification. Future research could include these different types of extra-regional influences in the analysis and compare how they affect regional diversification. Second, the study has shown that the effects of various factors (FOEs, SOEs) on regional diversification are not persistent over time. It is important to identify the reasons behind these time-varying effects in order to strengthen our understanding of the conditions required for different kinds of regional diversification to take place. This is particularly important for dynamic settings. Third, in order to improve our understanding of the role played by FOEs and SOEs in regional diversification, qualitative research is needed to reveal their agency and diversification strategies. Finally and most importantly, achieving new industry entries is not end in itself. More research is required to investigate how and under what conditions the identified regional diversification processes have translated into regional economic development (see Breul et al., 2021). This is especially the case for new industry entries by subsidiaries of FOEs, which do not automatically lead to beneficial regional economic outcomes as is suggested in research on branch plants, enclaves and global production networks.

References


Appendix

Table A1: Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Level</th>
<th>N</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>SD</th>
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<td>1</td>
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<td>100</td>
<td>19.7</td>
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<tr>
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<td>0.89</td>
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</tr>
<tr>
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<td>0.91</td>
<td>0.25</td>
<td>0.22</td>
</tr>
<tr>
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<tr>
<td>GDP per capita</td>
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<td>13,811.44</td>
<td>957.33</td>
<td>1350.38</td>
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