



Skills policy for growth and development: The merits of local approaches in Vietnam

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ABSTRACT

Vietnam has achieved rapid economic growth since opening-up its economy in 1999, but to achieve further growth the World Bank and others argue it must tackle intermediate level technical vocational skill shortages and gaps, as well as address the poor quality of its technical vocational education and training. The Vietnam government subscribes to such views, but the policy 'remedies' prescribed i.e. supply-side approaches and policy borrowing, as well as aspects of the initial 'diagnosis', seem highly questionable. Drawing on research on Vietnam's manufacturing sector, we discuss the skills shortage diagnosis and stakeholders' perspectives on the government's policy prescriptions to argue for an approach that recognises the merits of local level strategies, as a more effective way of addressing Vietnam's ambitions.

1. Introduction

By 2008 Vietnam had become recognised as a lower middle-income country, having achieved rapid economic growth since opening-up its economy in the 1990s (Ohno, 2014). However, it is has been argued by the World Bank and others, that to achieve further economic growth and industrialisation it must address skills mismatch problems (OECD and ILO, 2019; World Bank, 2013; Goodwin et al., 2014; di Gropello and Sakellariou, 2010). In this particular case, Vietnam is argued to have intermediate level technical vocational skill shortages and gaps, as well as poor quality technical vocational education and training (TVET) (see di Gropello and Sakellariou, 2010; Goodwin et al., 2014; Hilal, 2018).

To remedy the issues identified, and following strategies long encouraged and advocated by numerous international bodies (OECD, 2009; OECD and ILO, 2019; World Bank, 2013; Valiente, 2014), the Vietnam government has singularly focused on adopting 'supply-side approaches' to skills policy, neglecting demand-side initiatives, as well as borrowing education and training initiatives from developed countries (see Valiente, 2014). Government policy in Vietnam thus follows the imperatives of human capital theory i.e. that increasing the supply of skilled workers through investment in training and education will contribute to economic growth and technological upgrading (Becker, 1993). The investment is made, moreover, in education policies borrowed from elsewhere, with solutions originally formed in (and

promoted by) developed countries borrowed to improve its TVET programmes (see World Bank, 2013; ADB, 2014; Kis, 2017).

The question we ask in this paper is whether such modernisation approaches to development best serve the needs of Vietnam, and by extension those developing countries to which such policies, or versions of such policies, are applied (Valiente, 2014: 45. See for example, Allais (2012) on South Africa; King (2012) on India; Palmer (2009) on Ghana). In addressing this question, we reflect upon government policy, focused as it is on the imperatives of human capital theory, and offer observations on the relationship between skills formation strategies and goals of economic growth and development in developing countries like Vietnam. Theoretically, the discussion of what governments should be doing on such matters, and the way investment in skills should be organised, is often nested in the distinction between neoclassical and statist approaches to increasing levels of human capital. The World Bank, for example, has often taken a leading role in supporting skills development within developing countries and encouraged neo-classical policies based on market delivery and consumer preferences. However, the historical and political underpinnings of the East Asian context align more closely with statist approaches, and the emergence of the 'developmental state' (Ashton et al., 1999). Over past decades the region has experienced significant in-flows of capital and embraced new technologies and processes of globalisation, and this has often been supported by state led economic and industrial policies, with education and skills development

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playing an enabling role (Benson et al., 2013).

Reforms in Vietnam suggest a shift from central planning to a market economy, but this shift is far from complete and is paralleled by multiple other social, political and economic transitions, which are argued to position it between ‘developmental state and neo-liberalism’ (Masina, 2012). But, our aim here is not to provide any further theoretical contribution of this type and pronounce on Vietnam’s convergence, or otherwise, with neoliberal/neo-classical and statist approaches, nor its wider place in the regional productive system. Our intention is, instead, to provide a multi-scaler analysis of skill formation policies that identifies mismatch between global policies and national and local practices. We utilise current understandings of vocational education and skills formation in the developing world to examine Vietnam’s development, and contribute to the wider body of empirical work concerned with critiquing approaches to skill formation issues in developing countries (e.g. Allais, 2012; King, 2009; McGrath, 2014; Palmer, 2009).

To get closer to understanding the ‘skills problem’ in Vietnam, we investigate the ‘diagnosis’ (skills mismatch and VET quality issues) as a basis for questioning the remedies prescribed and exploring the merits of alternative strategies. Our analysis is based on data from a large project exploring skills mismatch in the machine manufacturing sector in Vietnam, which involved policy makers, vocational education and training institutions and employers. We contend that current policy approaches inadequately serve Vietnam’s needs and, in making this argument, we draw attention to the lack of attention to demand-side initiatives and the organic and tentative emergence of skills and industrial policies at local levels (by which we mean provincial or city governments). Here, we offer comment on the potential for such approaches to foster growth and development in ways that are more sustainable than the current policy direction taken by the Vietnam government.

In what follows we provide an overview of Vietnam with regard to its economic growth and development, as well as related discussions of skills policy developments. We then outline the research design, before presenting our data across three sections: i) skills mismatch; ii) policy borrowing, and; iv) local policy responses. Discussion and conclusions complete the paper.

2. Growth and skills policy in Vietnam

The Vietnamese economy has grown rapidly since the launch of the Đổi Mới policy in 1986 and the adoption of an export-oriented growth strategy (Nguyen and Truong, 2007; Ohno, 2010). The average gross domestic product (GDP) growth rate was 7.6 per cent in the period from 1991 to 2000 and 6.6 per cent from 2001 to 2010; a rate that has remained constant beyond 2017 and is projected to remain stable (World Bank, 2018). Industrial development has been a key factor for economic growth (World Bank, 2012) and the manufacturing sector, as the focus for this paper, has proved a particularly important driving force of economic growth and industrialization (Athukorala and Tran, 2012) – it has accelerated the economy’s transformation from agriculture-based to industrialized, with some sub-sectors e.g. automobiles, electrical equipment and garments growing faster than others (McKinsey Global Institute, 2012).

However, Vietnam’s progress and transition beyond a lower middle-income country appears to be stalling, mainly it is argued due to skills mismatch – an analysis that is strongly supported by the Vietnam government and made more complex by the development of advanced digital manufacturing technologies and Industry 4.0, and thus new layers of regional and global competition (VBF, 2010, 2014, 2017; Nguyen, 2020). In particular, it has been argued that in order to continue to grow and achieve greater industrialisation, Vietnam must address problems with the quantity and quality of intermediate vocational-technical level skills (ADB, 2014; Goodwin et al., 2014; Hilal, 2018; Kis, 2017; World Bank, 2013; OECD and ILO, 2019) – a diagnosis that we argue is questionable but common of many developing economies (e.g. Allais, 2012; Martinez-Fernandez and Choi, 2012; Packard

and Nguyen, 2014; Valiente, 2014). On the supply-side, the Vietnam government intends to address apparent skills mismatches by expanding the number of TVET graduates, which numbered 3.7 million in 2010 and 4.9 million in 2015, with plans for an increase to 34.4 million by 2020 (Government of Vietnam, 2011; GSO, 2016, 2014).

Intent on expanding supply, Vietnam has not, however, been actively intervening in the area of skill demand (e.g. facilitating high value added activity, associated upskilling and skills utilisation), which signals a key difference from other countries in the region that have adopted a more ‘developmental skill formation model’ (Ashton et al., 1999. See also Valiente, 2014 and Palmer, 2014 for wider discussion in relation to international development goals). For example, countries like Singapore have actively intervened in the demand side i.e. a focus on employer demand and skill utilization (Desjardins and Rubenson, 2011; Gog et al., 2014), as well as the supply side, by integrating skills and industrial policies (e.g. Desjardins and Rubenson, 2011: 375). The focus on supply belies the well-documented strategic limitations of the human capital imperative and supply-side solutions as a means to increase performance and boost productivity (e.g. Grugulis and Stoyanova, 2011; Wolf, 2004), but is nonetheless consistent with the economic discourse of education strategies promoted by intergovernmental economic organizations, such as the OECD and others, and adopted or borrowed by many low- and middle-income countries (see, for example, Valiente, 2014).

There has, moreover, been a significant reliance in Vietnam on skills policies ‘borrowed’ from developed countries to improve the quality of provision. In 2014, for example, the Vietnam government approved the *Project on Development of High Quality Vocational and Training Colleges by 2020*, which aimed to improve the capacities of forty selected vocational colleges nationwide and meet ‘international standards’, based in part on policies borrowed from other countries. Of course, both developed and developing countries habitually look elsewhere to learn policy lessons on how to improve educational outcomes. Often precipitated by an ‘impulse’, whether that be an external evaluation, such as the OECD’s Programme for International Student Assessment (PISA), or economic ambitions or political change. Phillips and Ochs (2003, 459–460) make clear, however, the ‘difficulties involved in proposing the adoption of ‘alien’ policies and procedures... [and] dangers inherent in any quick decision making based on a sudden enthusiasm for an educational idea born and nurtured and brought to maturity in a foreign context’ and this is something on which we offer comment.

In developing countries, there is often an attempt to import and borrow skills policy approaches and solutions for economic growth (and greater social cohesion), but it is a struggle to implement them and, at times, the policies are potentially harmful (e.g. Boahin and Hofman, 2014; Rahman et al., 2012; Allais, 2012). Allais (2012), on South Africa, for example, identifies how the borrowing of narrow outcome-based systems of vocational qualifications from Australia and UK failed to address the skills shortages problem identified, in part, as a leading cause of unemployment (i.e. the ‘impulse’). Indeed, it is often that the policies borrowed from elsewhere fail to reflect the social, cultural and political dimensions of transfer, as well as important economic and temporal aspects – as will be discussed later (e.g. Steiner-Khamsi, 2006). Steiner-Khamsi also draws attention to the crucial role played by transfer-brokers in such processes, and the priorities they push. Overall, the wider critique is of the problematic implementation of policy solutions from high to low- and middle-income countries (Valiente, 2014).

There are, then, tensions between supply- and demand-side policy approaches to vocational education to address skill mismatches in Vietnam. There are also global-national-local tensions in addressing skill mismatches by means of policy borrowing. The approach to (identifying and) addressing skills mismatch and shortcomings in the delivery of vocational education in Vietnam is framed by normative, or globally applicable (and borrowed), solutions. Such skills formation policies lack a dynamic/historic analysis of local social, economic, and institutional contexts, which a demand-side (and more locally orientated) approach to skills mismatch and TVET policy would emphasise (Ashton et al.,

1999; Brown, 1999). In this paper, considering the current policy approach, we give room to discussion of these perspectives to comment on the potential of local (and regional) approaches to skills and industrial development and the place of bottom-up initiatives.

Local initiatives sometimes present ways to break through skill formation challenges which national initiatives cannot solve (Froy and Giguère, 2010; Clark, 2009; Brown et al., 2001; Persson and Hermelin, 2018). The particular context of Vietnam, for example, with its large land area and population has led to the diversification of regional industrialisation, skill requirements and social characteristics. Hence, its geographic and demographic constraints can be treated as opportunities for local governments to play an active role in integrating skills and industrial policies. What is explored in what follows is how localities might focus differently, in contrast to the national government. Here, we discuss the extent to which focusing on a smaller number of industrial sectors within a relatively homogenous economy, might be a more effective way to achieve greater synchronisation of skills and industrial policies at the local level, where attention might be paid to the characteristics of each province or city (e.g. Snell, 2018; Payne, 2018).

3. The research

The data that informs this paper derives from a significant research project on skill mismatch in Vietnam, which focused specifically on the government priority of intermediate workers e.g. technicians and skilled operators (see Mori, 2019). The research aimed to provide a comprehensive picture of Vietnam’s skill formation system by examining the perceptions of three sets of key actors: i) national and local policy-makers; ii) employers, and; iii) educators. The reference to local policy makers is at the level of province and city. Any reference to the region would imply potential for alliances across cities and provinces. The study specifically focuses on skill mismatch in the machine manufacturing industry, which includes the automobile, motorcycle, and electric and electronic sectors – these industries have a high potential to increase manufacturing value added and require skilled workers (ILO and ADB, 2014; McKinsey Global Institute, 2012; UNIDO, 2013).

Data was generated through semi-structured face-to-face interviews, with some in group interview contexts. During the field research phase in 2016, we interviewed a total of 72 people across 54 organisations (see Tables 1–3). The latter includes: i) 12 governmental organisations, comprising 17 national and local officials responsible for skills or industrial policies, and 3 foreign aid and economic cooperation organisations (4 experts) to obtain supplemental information (see Table 1); ii) 27 firms, comprising 37 management staff members (see Table 2), and; iii) 12 education establishments, comprising 14 management staff members, including TVET institutions and universities, which run IVET courses in parallel with other university courses (see Table 3).

A significant number of interviews were conducted, but we acknowledge some limitations of coverage. For example, we were unable to access private vocational schools in the Red River Delta region and sought to address this by interviewing staff from a private university in the South East and private vocational college in South Central Coast. The lack of access to private vocational schools in the Red River Delta region means some unevenness in our sample related to vocational education provision and caution must be exercised with regard to any claims made in relation to the replacement institutions within our analysis.

Thematic analysis was carried out to identify patterns in key actor perceptions, and we also attempted to highlight cases, which are exceptions to the major patterns in order to identify elements that could help provide understandings of the potential challenges in Vietnam’s skill formation system. NVivo, a computer-assisted qualitative data analysis software (CAQDAS), was utilised to transcribe, code, and analyse data and structure the emerging themes as ‘theme maps’. Coding trees and theme maps were developed to show the associations between

Table 1
Governmental Organisation Interviewees.

No	Pseudonym	Region	Number of Interviewees	Interviewees
1	Ministry A	Red River Delta	1	Deputy Division Head
2	Government Agency A	Red River Delta	1	Deputy Director
3	National Policy Institution A	Red River Delta	3	1. Deputy Director 2. Officer A 3. Officer B
4	Ministry B	Red River Delta	1	Department Director
5	Ministry C	Red River Delta	1	Officer
6	Regional Office of Ministry C	South East	1	Department Head
7	National Policy Institution B	Red River Delta	1	Vice President
8	Government Agency B	Red River Delta	1	Deputy Division Head
9	Provincial Government A	Red River Delta	1	Department Director
10	Provincial Government B	Red River Delta	1	Vice Department Director
11	Provincial Government C	Red River Delta	3	1. Vice Department Director 2. Vice Division Director 3. Official
12	Provincial Industrial Zone Authority (in Province D)	South East	2	1. Deputy Director 2. Vice Division Director
<i>Number of interviewed Governmental Organisations: 12</i>			<i>Number of Interviewees</i>	17
1	Foreign Aid Agency A	Red River Delta	2	1. Foreign Officer 2. Foreign Investment Expert
2	Foreign Trade Promotion Agency A	Red River Delta	1	Foreign Officer
3	International Organisation A	Red River Delta	1	National Officer
<i>Number of interviewed Aid Organisations: 3</i>			<i>Number of Interviewees</i>	4
Total Number of Interviewed Governmental and Aid Organisations: 15			Total Number of Interviewees: 21	

research findings and causal conclusions. The final analysis not only broadens understandings of patterns with alternative explanations, but also provide clues that lead in different directions (Patton, 2015).

4. Skills mismatch and policies in Vietnam

Turning to the data, we set out across the following three subsections the perspectives of policymakers, educators and employers i.e. actors/stakeholders on i) the skill mismatch diagnosis; ii) policy borrowing to improve TVET quality/delivery, and; iii) the potential emergence of local policy initiatives in Vietnam. The aim here is to explore what is a seemingly far more complex and nuanced skills landscape than is commonly understood.

4.1. Skill mismatch

This first subsection explores the veracity of the skills shortage claims, which provides the foundation for the Vietnam government’s supply focused skills policies. It presents key actors’ perspectives on skill mismatch in the machine manufacturing industry, with special attention

Table 2
Firm Interviewees.

No	Pseudonym	Industrial Sector ^a	Region	Number of Interviewees	Interviewees
1	Japanese Automotive Assembler	Automobile	Red River Delta	1	Production Director
2	Japanese Electronics Assembler A	Electric and Electronic	Red River Delta	1	General Director
3	Japanese Electronics Assembler B	Electric and Electronic	Red River Delta	1	HR Manager
4	Japanese Motorcycle Assembler	Motorcycle	Red River Delta	1	GA Manager
5	Japanese Automotive Parts Supplier	Automobile	Red River Delta	3	1. Production Director; 2. Deputy Maintenance Director A; 3. Deputy Maintenance Director B
6	Japanese Plastic Injection Mould Supplier	Electric and Electronic	Red River Delta	2	1. General Director A; 2. General Director B
7	Japanese Plastic Parts Supplier	Electric and Electronic	Red River Delta	1	Admin General Manager
8	Japanese Motorcycle Parts Supplier	Motorcycle	Red River Delta	1	General Director
9	Japanese Heavy Machine Parts Supplier	Others	Red River Delta	2	1. General Director; 2. Production Manager
10	Japanese Machinery and Equipment Supplier	Others	Red River Delta	1	Director
11	Japanese Electronics Parts Supplier	Electric and Electronic	South East	1	HR Manager
12	American Automotive Assembler A	Automobile	Red River Delta	2	1. Managing Director; 2. HR Manager
13	American Automotive Assembler B	Automobile	Red River Delta	2	1. Factory Manager; 2. HR Manager
14	European Motorcycle Assembler	Motorcycle	Red River Delta	1	HR Director
15	European Electric Parts Supplier	Electric and Electronic	Red River Delta	2	1. Recruitment and Training Leader; 2. HR Specialist
16	Taiwanese Plastic Parts Supplier	Electric and Electronic	Red River Delta	2	1. Sales Manager; 2. Production Control Specialist
17	European Automotive Parts Supplier	Automobile	South East	1	Managing Director
18	Taiwanese Electronics Parts Supplier	Electric and Electronic	Red River Delta	1	HR Staff Member
19		Automobile		1	Acting Director

Table 2 (continued)

No	Pseudonym	Industrial Sector ^a	Region	Number of Interviewees	Interviewees
	Vietnamese Automotive Assembler		South Central Coast		
20	Vietnamese Plastic Parts Supplier	Automobile	Red River Delta	1	General Director
21	Vietnamese Electronics Parts Supplier	Electric and Electronic	Red River Delta	2	1. HR Manager; 2. HR & PR Manager
22	Vietnamese Plastic and Metal Parts Supplier	Electric and Electronic	South East	1	Managing Director
23	Vietnamese Mould and Die Supplier A	Motorcycle	Red River Delta	1	General Director
24	Vietnamese Mould and Die Supplier B	Motorcycle	Red River Delta	1	Director
25	Vietnamese Motorcycle Parts Supplier A	Motorcycle	Red River Delta	2	1. Managing Director; 2. HR Manager
26	Vietnamese Motorcycle Parts Supplier B	Motorcycle	Red River Delta	1	Deputy CEO
27	Vietnamese Production Equipment Supplier	Motorcycle	Red River Delta	1	Director
Total Number of Interviewed Firms: 27		Total Number of Interviewees: 37			

Firms may be involved in multiple industrial sectors.

paid to ‘skill shortages’ i.e. ‘a situation in which the demand for a particular type of skill exceeds the supply of available people with that skill’ (Cedefop, 2010, 13) and the anticipated direction of skills demand, which informs such notions.

Here, with regard to understandings of skills shortage at the intermediate occupation level we note that policymakers’ (and, indeed, our educator interviewees’) perspectives are in line with World Bank (2013), and others’ (e.g. OECD and ILO, 2019), views, as documented previously:

We have always recognised that our labour market has a mismatch between skill demand and supply. Normally, many occupations require very high levels of skills, but we have a shortage of elementary and intermediate-level technicians. [Officer B, National Policy Institution A]

Overall, according to our policymaker and educator interviewees, it would seem that two economic factors inform increasing demand for intermediate workers: i) predictions that integration to the regional and global market through the ASEAN Economic Community (AEC) and the Trans-Pacific Partnership (TPP) will expand the demand for skilled workers, and; ii) anticipation that an increasing inflow of FDI will promote technological development and hence expand the demand for skilled workers:

Actually, I think in the future, a lot of big foreign companies or famous brands will come to invest in Vietnam. So, they will bring high technologies into Vietnam. So, they will require workers in Vietnam. [Officer, Ministry C]

The same interviewees suggest that such positive perspectives are

Table 3
Educational Establishments Interviews.

No	Pseudonym	Affiliation	Region	Number of Interviewees	Interviewees
1	Public University A ^a	National Government	Red River Delta	1	Vice Rector
2	Public University B ^a	National Government	South East	1	Vice Rector
3	Private University A ^a	Private Owner	South East	2	1. Vice Rector 2. International Cooperation Staff
	<i>No of University: 3</i>	<i>No of Interviewees</i>		<i>4</i>	
4	Public Vocational College A	Provincial Government	Red River Delta	1	Rector
5	Public Vocational College B	Provincial Government	Red River Delta	2	1. Rector 2. Vice Rector
6	Public Vocational College C	National Government	Red River Delta	1	Rector
7	Public Vocational College D	Provincial Government	Red River Delta	1	Vice Rector
8	Public Vocational College E	National Government	Red River Delta	1	Vice Rector
9	Public Vocational College F	Provincial Government	Red River Delta	1	Vice Rector
10	Public Vocational College G	Provincial Government	Red River Delta	1	Rector
11	Public Vocational College H	Provincial Government	South East	1	Rector
12	Private Vocational College A	Private Firm	South Central Coast	1	Rector
	<i>No of TVET institutions: 9</i>	<i>No of Interviewees</i>		<i>10</i>	
	Total Number of Interviewed Educational Establishments:	12	Total Number of Interviewees	14	

Note Three universities run TVET courses as well as university and professional college courses.

reflected in the optimistic targets and scenarios promoted in government policies (giving shape to industrial strategy), starting with the Human Resources Development Master Plan (HRDMP) of 2011, which made predictions on job creation and skill demand till 2020. However, these national policies and strategies are not necessarily based on compelling evidence and analysis – a number of employers (11 of the 27 firms) interviewed criticised government targets and, more importantly, its wider industrial strategy for being unrealistic:

Without doing something drastic now, the current situation (of sluggish growth in skills demand) will continue. The issue of the job shortage I talked about before is really serious. Most jobs are filled, since there are few vacancies regularly created by retirement... If we cannot expect further growth of the manufacturing industry, which used to provide massive job opportunities...it would be an important decision for the government to not merely rely on firms' job creation efforts. Vietnam would not have bright prospects if the government were still only discussing 'following industry skill demand'. (GA Manager, Japanese Motorcycle Assembler)

And yet, policymakers and educators attribute current skill shortages to supply-side problems. Here, for example, half of the policy makers (six of the governmental organisations) stated that educational establishments fail to meet employer skill needs:

The capacity of the vocational training institutions cannot keep pace with the change.... Technologies and science have been developing too fast, while the education system in Vietnam has not been adjusted to be meet the country's development needs and other elements such as the increasing number of enterprises. [Deputy Division Head, Ministry A]

For two-thirds of educators (8 of the 12 educational institutions) the problem is about keeping pace with change. The complaint is about acquiring data on emerging skills shortages and needs, which it is argued is not forthcoming from employers:

Many companies just complain that the students from vocational training schools cannot meet their requirements, but when we asked them what their specific requirements are in order to learn their skill needs and to provide training programs to meet them, none of them could provide the answers. [Vice Rector, Public Vocational College D]

However, the employers' perception of skill shortages, as well as anticipated demand (and thus future skill needs and potential shortages), presents – as indicated above – a quite different and much more nuanced picture of skills mismatch issues. Here, for example, we find that the four large Japanese firms we interviewed, which have been

operating in Vietnam for about 20 years, reported no skill shortages for any occupation level:

Well, I consider that we secured most of the engineers, technicians, and skilled operators we currently need...I have rarely heard that we face difficulty in recruiting engineers or production line operators. We usually receive many job applications once we post a vacancy notice. [General Director, Japanese Motorcycle Parts Supplier]

This might be because such firms tend to make greater efforts to train their employees (see, for example, [Konings and Vanormelingen, 2010](#)), but the current labour market also favours large employers regarding skills acquisition. Further, interviewees from large Foreign Invested Enterprises (FIEs) mentioned that they are not seriously concerned about skill shortages since the labour market is – in their view – becoming less competitive. But, if we disaggregate to different areas of production e.g. assemblers and suppliers the data suggests different sets of perceptions are held.

Indeed, for example, only a minority of suppliers (four of 19), those producing small-lot goods in non-routine processes, have a high demand for intermediate level workers, including within both FIEs and local firms. Suppliers of this type explained that non-routine manufacturing requires more multi-skilled workers who can adapt quickly to various processes and products than standardised mass production, which places a higher emphasis on improving the quality of skills – with the poor quality of skills provision being something employers often complained about:

I am satisfied with the number of people, but skill level varies by each person (maintenance technician). The current skill level of our Vietnamese technicians is far too low. They meet only 30 per cent of our requirements...I think there is a very large gap between their current skill level and our requirements. [Deputy Maintenance Director A, Japanese Automotive Parts Supplier]

More particularly, the above 'supply' concerns do not necessarily mean that there are large skill shortages and, for several reasons, the employment of intermediate workers might be quite low e.g. the employment scale is often small, which reflects small-lot product suppliers, skill demand is subject to fluctuations, depending on the business environment, employers foresee no major changes in skill requirements or occupational structures, etc. Hence, their orientations are more immediate and short-term, which is in contrast to the national focus on long-term and large-scale human capital development (see [Romer, 1990](#)). More broadly, in contrast to policy-makers and educators, employers do not necessarily perceive the development of a high demand for intermediate workers that forms a central part of government policy – at least in terms of a significant expansion of supply.

Evidently, according to employers, skill demand is not developing in quite the way anticipated by policy makers and others (e.g. [World Bank, 2013](#)) – even if the two principal drivers of skill demand, outlined earlier, namely regional economic integration and increasing FDI inflow accompanying technological progress, are to be accepted. Driven by the imperatives of human capital theory, the national government focuses on long-term policies of skill formation – with demand pushed by the aforementioned drivers. But, some policymakers (and, indeed, educators) indicated some scepticism about the effects of these drivers – with one Deputy Division Head of Government suggesting some uncertainty on whether regional economic integration will allow Vietnam to be a production base for FIEs and other policymakers suggesting that FIEs may mainly require *unskilled* workers. This scepticism about growing skill demand was found to be higher in provinces that have recently started attracting FDI and it is noteworthy that during the interviews several local officials from these provinces drew attention to the need for unskilled workers, such as production line operators, rather than skilled workers:

From my point of view, I think the quality of the labour force in [this province] is quite good. And [our provincial department], through the vocational training institutions, also implements some policies for skill development. But...right now companies are recruiting mostly unskilled workers. Therefore, it is really hard for the colleges to improve education quality. [The Vice Department Director, Provincial Government C]”.

Overall, it seems that the perceptions of skill shortage and demand are misaligned. In short, whilst the government and public education institutions envisage a need for greater numbers of qualified people, industry is less convinced – where there is agreement between all interviewees, it is for the improved quality of graduates.

Half of policymakers (six of the 12 governmental organisations) and the majority of educators (ten of 14 educational establishments) concur on skills shortages and have a positive view about growing skill demand – a perspective that aligns with previous studies on Vietnam ([World Bank, 2013](#); [ADB, 2014](#); [Goodwin et al., 2014](#); [OECD and ILO, 2019](#)). However, interviews with employers suggest that skill shortage is overstated, and skill demand is not increasing or changing as dynamically as anticipated – in relation to technology or otherwise. Certainly, employer expressions of ‘high’ skill demand cannot be always interpreted as ‘large-scale’, and simply increasing the supply of skilled workers does not automatically ensure that employers will utilise them. As we will argue, the focus on supply to meet ‘anticipated’ skills demand, has led to the neglect of skills and industrial policies integrated in ways to develop the demand-side in line with Vietnam’s ambitions for growth and development.

4.2. TVET policy borrowing

The previous section indicates misalignment in key actors’ understandings of skills shortages and gaps, which raises questions about the government’s policy direction and expanding the supply of intermediate level technical vocational skills without addressing the demand-side. A further policy question concerns improving the quality of TVET programs, which as our data indicates in the previous section is, perhaps, less questionable than the skills mismatch diagnosis.

As noted at the outset, to address the quality issue the government is borrowing skills policies, mainly from developed countries. Such examples are numerous, and we briefly outline three for later discussion. Our first example focuses on curriculum reform and the Vietnam government’s promotion of curricula from other countries. Several of our educator interviewees reported the importing of curricula, as well as skills standards and skills assessment methods, from a wide range of countries, such as Australia, Germany, Malaysia, South Korea and Japan, mainly through *official development assistance* (ODA) projects:

From the year 2015, we have had 5 curricula which are internationally equivalent. These programs were borrowed from Australia and we also sent our staff to Australia to be trained. And the curricula and programs at our college are adjusted according to the Australian programs. (Those curricula are about) mechatronics, electric installation and control, IT application software, graphic design and industrial electronics. [Vice Rector, Public Vocational College B]

This interviewee was confident in his college’s ability to synthesise different countries’ models, but when pressed could not articulate how such models could be aligned with Vietnamese employer skill needs.

Our second example draws attention to the government’s promotion of training and recruitment contracts between firms and TVET institutions, and the broader aim to build quality and enhance TVET programs in line with employers’ requirements ([ADB, 2014](#); [Government of Vietnam, 2012](#); [Vietnam National Assembly, 2014](#)):

If we want to improve the relationship between schools and enterprises, schools should contact enterprises to get a commitment or agreement, something like that. Schools have a commitment to ensure the quality of the human resource supply, and enterprises agree to receive some students from schools after graduation. [Officer, Ministry C]

According to the interview data, policymakers are inspired by the apprenticeship contracts (and links to secure employment) promoted in some developed countries ([OECD, 2017](#)), particularly the German Dual Apprenticeship system which is often held-up as best practice and a benchmark of VET quality, and which is underscored by strong social partnership and collective arrangements ([Bosch and Charest, 2008](#)). However, such policies seemingly risk causing a strong backlash from employers:

They (policymakers and educators) may still be in another world (of the planned economy) where they cannot imagine that firms do not have a precise recruitment forecast and recruit people according to it. In reality, business may go well or bad. So, it is impossible to recruit people according to a long-term plan when our business is not going according to the original business plan. [General Director, Japanese Electronics Assembler A]

Our final example, finds the government preparing to establish Sector Skills Councils (SSCs), following the UK model, to deliver high quality relevant skills. SSCs are to be launched on a trial basis in the electricity, mining, and tourism sectors, with assistance from foreign and international organisations, such as the British Council and the International Labour Organization (ILO). According to one policy maker, it is likely that large state-owned enterprises (SOEs) will be the main representatives from industry to SSCs:

As I know, in the UK, each Sector Skills Council consists of many companies. So, they work together to develop national occupational standards. Therefore, the quality is good and it is more effective in the UK. [Officer A, National Policy Institution]

However, the extent to which SSCs will function in Vietnam is uncertain, given that they have never worked efficiently in the country from which they are being borrowed (e.g. [Payne, 2008](#)). Moreover, the research found that the government has neither issued a policy to define the implementation structure of SSCs, nor provided a concrete government solution for mobilising engagement of FIEs and local private firms, which are important constituents.

The borrowing of these initiatives signals a pressure for reform – in this section on TVET quality specifically, but we might also reflect in similar ways on the ‘impulse’ for wider modernisation along the lines of supply/human capital narratives discussed in previous sections ([Valiente, 2014](#)). Indeed, what perhaps becomes most evident from these examples, as will be discussed in more detail later, is the critical

flaws of policy borrowing, with regard to decision-making, implementation and internalisation processes (see [Phillips and Ochs, 2003](#)).

4.3. Local policy responses

With the above in mind, in this sub-section we offer some reflection on the formation of skills and industrial policies at the level of the locality, which seem to be emerging as a more effective way to attract high skilled jobs and better address the needs of firms operating in different regions of Vietnam. The data indicates, for example, that three of the four local (i.e. provincial) government authorities expressed a willingness to engage in comprehensive ways with local actors and firms to facilitate training requirements:

If some companies want training courses for their workers, they come to consult with our training centre and it introduces some schools to companies. There are two ways. First, [their training centre] can introduce companies and schools to each other and facilitate partnerships. Second, we cooperate with schools to develop training programs according to companies' needs.... So, the most important role for us is to be an intermediary to bridge the gap between schools and companies. [Deputy Director, Provincial Industrial Zone Authority]

These provinces have been actively attempting to attract high skilled jobs to their region. According to the above Deputy Director, the provincial government has been trying to attract investment from higher-value added manufacturing industries, and no longer accept investment from low-skilled labour-intensive industries:

...we had a policy to attract investment in the fields which use a lot of workers (labour-intensive). But since 2007, our province has stopped accepting investment by textile-garment, leather-shoes, and wood processing companies in our industrial zones if they use more than 1000 workers...This policy aims to attract more investment from companies which use fewer unskilled workers and focus on those which apply higher technologies and employ higher-skilled workforces... (after policy implementation)... the demand for skilled workforces has increased.

Such examples are not isolated:

'In [Province B] we have comprehensive policies of development, and under them, we have different components, for example, an industrial development component. The industrial development policies consist of different policies, for example, human resources, an industrial zone for industrial development and also the supporting industry, and so on. So, I think our vocational training policy and also the supporting industry development are under the general strategy of provincial development...' [Vice Department Director, Provincial Government B]

This Vice Department Director started industrialisation by attracting FDI relatively early and reported that they have been trying to promote long-term TVET courses to achieve the provincial target to develop supporting industries.

However, such cases are not entirely representative of the overall situation in Vietnam. First, these local initiatives are limited to the places where industrial agglomeration is proceeding more quickly due to a large FDI inflow. Second, it would seem that local power structures are uneven and not sufficiently developed to support policy development at the province level, but this is a deficit acknowledged by national government:

Now in Vietnam with the decentralisation, provincial governments have been given more authority...We hand over the power, but the people in province, they don't have the capacity. The central government has not empowered them enough...We should build their

capacity before decentralisation, before assigning new jobs and new functions to them. [Department Director, Ministry B]

The broader process of decentralisation perhaps indicates some acknowledgement of the limitations of national policy imperatives ([Vu, 2016](#)). In light of the situation in their localities, half or two of the four local officials were sceptical of the assumption that skill demand is rapidly increasing. In fact, their feelings represent what the supply-side approach neglects to articulate i.e. the number of quality skilled jobs would not necessarily increase even if the economy grows at the national average, in particular in vulnerable regions which receive less policy support and investment by firms ([Dobbins and Plows, 2016](#)). However, such scepticism is outweighed by a more pervasive optimism on increasing skill demand in the process of formulating local (and regional) industrial and skills policies.

Indeed, some employers (eleven of the 27 firms interviewed) argued for government to formulate more strategic and consistent industrial policies with a long-term vision – not only for business expansion, but also to facilitate national upskilling that is more in line with patterns of economic development. On this, interviewees proposed implementing policies to develop supporting industries, including producers of intermediate and capital goods such as parts, materials, and production equipment (see [Mori, 2006](#)). As it is, policymakers at the national level seem not to be responding particularly well to employer calls for more effective industrial policies to stimulate skill demand, but as we have outlined above there is evidence emerging of several positive cases of industrial-skills policy synergy at the local level.

The seeming ineffectiveness of the national authorities and government policy is underscored by employers' sometimes reluctance to engage with national government:

Our partners are Japanese companies. We spend almost 100 % of time for business activities. We do not need any support from the (national) government, and we can survive by ourselves. That is why we do not need to cooperate with the government. [Director, Vietnamese Mould and Die Supplier A]

The main source of reluctance was a perceived ineffectiveness of government policy, with employers also indicating that they felt more comfortable dealing with local governments over national authorities e.g. several local suppliers indicated a greater willingness to cooperate with local governments on TVET reforms. However, it is also worth noting that corruption is a significant issue in Vietnam, which may have some bearing on employers' disinclination to engage with national government (and, indeed, may be worse at the local level) – not that we have direct comment from our interviewees on this sensitive issue. What is evident is that the World Economic Forum ranks Vietnam 101th out of 141 countries in its transparency index ([World Economic Forum, 2019: 595](#)), but the evidence is mixed on the extent to which excessive centralisation, over uncoordinated decentralization, is the primary source of corruption (e.g. [Vu, 2016; Truong and Rowley, 2013](#)).

5. Discussion

Extant research often concludes that Vietnam should introduce an employer-led skill formation model informed by a supply-side approach, based on an assumption that skill supply trails behind increasing skill demand, in particular at the intermediate occupation level (e.g. [OECD and ILO, 2019; World Bank, 2013; di Gropello and Sakellariou, 2010](#)). In other words, it suggests that Vietnam borrow, or adopt, 'normative' skills policy solutions promoted by powerful interests (e.g. World Bank, OECD) and created in developed countries ([Steiner-Khamsi, 2014](#)). The latter is based on: i) the assumption that human capital theory has general applicability and; ii) that the measures borrowed – in terms of building both quantity and quality of skills – function perfectly in developed countries, despite evidence often being to the contrary. What we argue is that the policy prescriptions recommended for Vietnam, as

with other developing countries (see [Valiente \(2014\)](#) for a wider perspective), often fail to reflect an accurate analysis of the 'skills (mismatch) problem'. Here, there is clearly a misalignment between policy-maker and employer perspectives that informs a policy misdiagnosis, which does not offer an appropriate strategy for Vietnam's transition beyond a lower middle-income country.

What the national government's current thinking reflects perhaps is an effort to utilise skills policy to create more certainty (of supply to serve growth) and build economic and social resilience, for what remains an often uncertain (national and global) picture ([Romer, 1990](#)). This policy focus has a temporal aspect, whereby the Vietnam government focuses on long-term human-capital development as important for future growth, but firms strategize to meet more immediate skill demands (e.g. see our data on companies involved in assembly and parts supply). Firms are thus less concerned with long-term strategies on investments in large amounts of human capital (beyond, perhaps, the evidence that it is investments in primary and secondary education that are critical e.g. [Wolf, 2004](#)), but the focus on significantly expanding intermediate skill level supply – often at the behest of others – remains central to national government priorities and explains its current policy focus (see [Romer, 1990: 98](#)).

In light of our evidence, the first point we make is that Vietnam policymakers must question the supply-side paradigm routinely pushed on developing countries, and in doing so address the demand side as well as the supply-side in more integrated ways i.e. ensure a closer match between what is demanded and what is supplied ([Ashton and Sung, 2015](#); [Brown et al., 2015](#); [Gog et al., 2014](#)). The development of integrated skill formation strategies will require regular and intensive discussions among key stakeholders (see, for example, points below on decentralisation). At present, it seems that national government officials fail to coordinate skill demand and supply sides, nor do they seem to fully understand Vietnam's skills mismatch issues, as the data clearly shows, as well as demonstrating a low commitment to actively participating in stakeholder dialogues for skill development in Vietnam.

This is in contrast to countries like Singapore and South Korea in the region, which have institutional mechanisms and technocrat teams capable of coordinating skill demand and supply at the developmental stage ([Ashton et al., 1999](#); [Park, 2013](#); [Ohno, 2014](#)). Of course, additionally, Vietnam's large size, in terms of population and land area, means that the progress of skills and industrial development may vary considerably between places e.g. those areas with relatively high levels of industrial agglomeration and those regions relying on agriculture. It would be hard even for highly capable national officials to centralise the coordination of diverse skill demand and supply scenarios – hence, our focus on local initiatives, as discussed later.

The second related point, is that Vietnamese policymakers are seemingly unaware of the possible consequence of policy borrowing. In part, it would seem policymakers are likely to believe that borrowed measures function perfectly in developed countries – despite evidence being to the contrary (see, for example, [Payne \(2008\)](#) and [Keep \(2015\)](#) on SSCs in the UK). Indeed, as noted at the outset of the paper, this is a more general issue, with developed countries, as much as developing countries, attempting to import policy success without properly considering what is necessary for effective borrowing (see [Phillips and Ochs, 2003](#)). More particularly, there is a lack of awareness concerning the 'transfer brokers' of policies ([Stone, 2001](#)) and openness concerning the imperfections and diversity of developed countries' models. There is, for example, often a time lag between the formulation of policies in developed countries and their adoption in developing countries. Hence, by the time 'best practice' is adopted by developing countries, they are often starting to be dispensed with in their countries of origin (see [Steiner-Khamsi, 2006](#)).

In Vietnam, the research findings indicate that foreign donors are one of the main policy transfer brokers. In particular, some influential bilateral and multilateral aid organisations are apparently inclined to transfer the supply-side approach, given the active transfer of its

components such as SSCs through ODA projects and other technical assistance activities ([World Bank, 2013](#); [ADB, 2009](#); [Kis, 2017](#)). The mistake of believing in the superiority of developed countries' skill formation systems, to address quality issues for example, is likely to be amplified since these organisations are recommending donor countries' models without candour on their limitations and a thorough analysis of their applicability to the Vietnam context.

On this, [Heitor and Horta \(2016: 146\)](#) make similar observations in relation to emerging regions' accelerated expansion of higher education, with the borrowed policies and practices of mature higher education systems jeopardising the sector in these places. These authors identify the need to pay attention to the *illities* of the public policy process, which may include but not be limited to aspects of affordability, quality, capacity, adaptability and autonomy, to reform systems in appropriate and strategic ways. This requires consideration of our interviewees' differing priorities (e.g. firm - local - national) and the operationalisation of borrowed policies in ways that reflect the specific conditions and challenges of Vietnam and its localities ([Heitor and Horta, 2016](#)).

At present, based on the myth of the superiority of developed countries' skills policies, the Vietnam government is importing various models without clear strategies for policy alignment and customisation. The danger is that if the government maintains its policy of importing various countries' models in a patchy way Vietnam's skill formation system will become fragmented. [Phillips and Ochs \(2003: 455\)](#) warn that this simple policy borrowing method, which they call the 'quick fix' decision, causes dangerous outcomes. Indeed, our interview data indicates that the current policy direction may result in expanding distrust in forging partnerships between the key actors.

Employers, for example, complained that a policy of promoting recruitment and training contracts between firms and TVET institutions (based on Germany's dual apprenticeship) is not realistic due to uncertain and weak skill demand. Further, educators are likely to be put in the difficult position of implementing 'borrowed' skills policies which focus solely on the supply-side without integrated intervention in the demand-side – thus illuminating the tensions presented by normative and global solutions to skills mismatch and the shortcomings of TVET (which would be necessary e.g. importing systems, like the dual system, that is reliant on demand-side actor involvement). One way the government might break through the deadlock of weak employer demand and the threat of what we view to be mutual distrust among key actors is to address the demand-side by integrating skill and industrial policies ([Ashton and Sung, 2015](#); [Brown et al., 2015](#); [Sissons and Jones, 2016](#)). However, as stated previously, current national government interventions in the demand-side are neither proactive nor effective.

The broader contention here relates to our third substantive point and the importance of local policy initiatives, which indicate where there is potential for demand-side approaches to evolve in the context of medium-size developing countries like Vietnam. Whilst the data is limited, what this research found is that several provincial governments indicated confidence in being able to implement industrial policies that include elements which will stimulate skill demand. This is a viable form of industrial policy formulation and implementation for Vietnam. It might, then, be more effective for local governments, to design and implement detailed policy measures in close consultation with local industries, while the national government provides overall policy frameworks. Building on this, local (or regional) industrial policy initiatives can also encourage small and medium suppliers of higher value-added products, which are likely to require more intermediate workers, to engage in policy formulation processes, taking advantage of physical and psychological proximity ([Brown et al., 2001](#); [OECD, 2016](#)).

Indeed, it seems to us that local initiatives sometimes present ways to break-through skill formation challenges which national initiatives cannot solve ([Froy and Giguère, 2010](#); [Clark, 2009](#); [Persson and Hermelin, 2018](#); [Snell, 2018](#)). However, several challenges can be predicted in promoting bottom-up policy development, which requires extensive networks and coordination among various actors (see, for example,

Stroud et al., 2018; Payne, 2018). For one thing, as the data indicates, local governmental officials often lack the capacity to design and implement integrated skill formation strategies; our cases indicate that there is stronger alignment from local government with the sometimes narrower and more short-term orientations associated with some firms. Hence, there may be tension between local governments that attempt to implement policies based on local characteristics and firm-priorities, as opposed to the national government which wants to ensure policy coherence across regions – in this case for large amounts of human capital (Romer, 1990; OECD, 2009).

In particular, local governments would face significant limitations in implementing their initiatives when the accountability mechanisms for education and training programs, which often link with the funding mechanism, are highly centralised (e.g. Payne, 2018). What is central to this part of the discussion is the question of decentralisation and the transfer of power and resource from central government to the regions. Local governments could be enabled to overcome the challenges, but this requires support from the national government – including to overcome corruption, a problem of which is perhaps more acute at the local level. Whilst it seems evident that local governments require greater strategic and operational capacity to hold power and resources, what remains unclear from this research is the extent of power holding by central government. Local government officials will need collaborative leadership skills and sufficient knowledge of skill supply and demand trends to facilitate local or regional upskilling initiatives (Froy and Giguère, 2010). In order to achieve this, there is the need for knowledge transfer (from national government) and a need to encourage mutual learning of local best practices across cities and provinces (Osterman, 2008)¹.

Hasanefendic et al. (2016: 337) usefully draw attention to the need for technical and vocational training systems to be more flexible and adaptable to the needs of firms, but note that this requires partnership between firms and education providers to focus training on local companies' needs. The latter's analysis highlights the necessity of human infrastructure, networks of key stakeholders, for 'knowledge circles', along with appropriate institutional contexts (e.g. centres of expertise) and incentives (e.g. funding) to stimulate knowledge exchange, training, collaboration and employment and thus facilitate closer matches vis-à-vis skills, firms, training institutions, as well as society, underwritten and supported by both local and national government (see Kolehmainen et al., 2016). The national government has to provide an overall vision and institutional framework of national skill formation (Snell, 2018), while devolving the necessary authority to local governments for activities such as policy and program designing, budget allocation, and partnership development with key actors e.g. to establish effective forms of partnerships with employers (OECD, 2009; Osterman, 2008). Otherwise, without a greater commitment to decentralisation, the roles of local governments will be limited to the implementation of narrow strategies rather than the formulation of integrated skill formation strategies (see, for example, Stroud et al., 2018).

Of course, our observations (and evidence) in relation to this third point apply to specific sectors and industries within the Vietnam context, and further evidence from a range of sectors within similar national contexts would provide a more complete picture of skill formation in countries with same ambitions for economic growth. But, for developing economies, like Vietnam, it seems to us that local government initiatives – properly devolved from and supported by national government – have the potential to produce far better outcomes, as they can be focused on a

smaller number of industrial sectors within a relatively homogenous economy (OECD, 2009), where the diversity of skill needs may be narrower. They are also in a better position to develop rapport with local firms, including SMEs (Brown et al., 2001; OECD, 2016). For example, what this research found is that some local suppliers had a willingness to engage in local- or regional-level policy dialogues. Of course, local government initiatives need to overcome various challenges, such as capacity constraints, short-termism and a need for further analysis of evolving local initiatives and what is viable, as well as wider consideration of the implications of extant and emerging challenges e.g. from corruption to – as mentioned at the outset – the fourth industrial revolution or, for manufacturing specifically, Industry 4.0.

On the latter, particularly, previous studies have claimed that Vietnam faces a high risk of job-losses from new digitalised technologies, particularly within elementary occupations, such as production-line operators in the garment industry (e.g. Hilal, 2018; Chang and Huynh, 2016). Within the Vietnamese machine industry, as the focus of this research, the evidence indicates, for now, a slow and incremental insertion of new technologies with low impact, which likely results from insufficient economies of scale caused by the limited size of the domestic market. But policy responses (at national and local levels) will be necessary to address the potentially disruptive (but not necessarily negative) outcomes of these rapidly developing technologies (e.g. Brown et al., 2018).

It is, of course, not simply about investing in human capital but building an appropriate response to a changing environment. Thus, whilst the first steps of Vietnam's 'digital revolution' – as part of 2019's Politburo Resolution 52 – are said to be underway, with polices on the development of enabling infrastructure, creative capacities, human resources, and priority sectors (Nguyen, 2020), what will prove critical for dealing with the inevitable challenges (e.g. fundamental changes in industrial structure and the labour market) is coordination across national and local ministries and between private and public sectors – particularly with regard to how education and training institutions, government and industry coalesce for the facilitating knowledge creation and skill formation (for related discussions see, for example, Jung (2020) on the challenges facing South Korea's higher education system).

6. Conclusion

In our assessment, for developing economies like Vietnam, the specific need is to determine more accurately constraints in promoting local integrated skill formation (and industrial) policies. The focus here is to identify the appropriate degree and style of decentralisation and devolution – a difficult task for most large developing countries (OECD, 2009), but one that might better facilitate economic growth and development than the current policy focus. Indeed, what the emergence (and seeming success) of local policies provides is a challenge to narrowly constituted human capital (and neo-classical) orthodoxy and the assumption that developed world policies neatly address the needs of developing economies.

This has clear implications for policy development. Any kind of standard skill formation model needs to adjust and evolve with careful consideration of the social, economic, cultural, and institutional contexts of each locality, as well as country, through active learning processes. What this research suggests is that local government initiatives on integrated skill formation is that they are more likely to be effective than the national government's top-down approach in Vietnam, particularly as industrial development differs by province or region. As such, local governments are likely to have a better chance to identify and involve dynamic small and medium companies/suppliers in the policy formulation process. The role of the national government is then, to assist local governments in developing their capacities through knowledge transfer and mutual learning on good local practices and to formulate broader policy frameworks to facilitate such processes.

¹ A related frame of analysis is the quadruple helix, which is a development of the triple helix model of economic development, involving businesses, universities and public sector organisations, to which is added social and community groups, when considering local economic development agendas and patterns of, for example, innovation, knowledge exchange and collaboration (see Kolehmainen et al., 2016).

CRedit authorship contribution statement

Junichi Mori: Conceptualization, Methodology, Visualization, Software, Data curation, Investigation, Writing - original draft. **Dean Stroud:** Conceptualization, Methodology, Visualization, Supervision, Writing - review & editing.

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