

SIGNIFICANT SERVICE SECTOR GROWTH IN INDONESIA: CHANGE FOR THE BETTER?



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Preface

Several years ago, I signed up for some geography courses at the University of Groningen, just to broaden the mind. I remember that I loved it from the first day. I stayed for the entire program, and this thesis is the final part. Studying geography satisfied an intellectual hunger to learn more about the world, with the freedom of using a diverse range of academic approaches. Apart from that, it awakened the desire to explore the world by travelling. Seeing so many contradictions, especially in developing countries, made me wonder about the process of development. So when it was suggested to study the development of the service sector for Indonesia for my master thesis, the choice could not have been easier. However, writing the actual thesis could have.

Writing this thesis has been a challenging process. I have learnt a lot, both in knowledge and in skills. Therefore, I am grateful for the help and support I received during the process.

I would first like to thank my supervisors, Sierdjan Koster and Fikri Zul Fahmi, for their time, input, and their pleasant style of advising.

Sierdjan Koster made me see the importance of reader-friendly writing. I remember his comment on a chapter draft version, that he thought the content was good but that he did not follow what I was doing and why. At that moment I realized that my minimalist approach to writing was at the expense of understandability. Good writing should be concise but clear. For me it meant taking more effort to guide the reader by explaining choices and directions, and their implications. I am grateful for this valuable lesson; it will help me a lot in my future work. Thank you.

I would like to thank Fikri Zul Fahmi for taking on a mentoring role, especially in the last months. He encouraged me to make many adjustments to the analysis and to put in more work, in order to improve the quality of this thesis. Now that I look at the result, I know that it was worthwhile. Apart from that, many thanks go to him for practical help with the Indonesian census data. Even though he has extensive knowledge on this topic, he let this be my own project, for which I am grateful.

I would also like to express my gratitude to Petra Werkman, who proofread the draft version of this thesis, for generously giving her free time, and for giving such constructive comments on grammar and style. It meant a lot.

I would like to thank my friends and loved ones for being there for me, and for bringing joy and growth into my life. Very special thanks go to my wonderful parents, for offering limitless love and support.

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Chapter 1 | Introduction

Over the past forty years, Indonesia has undergone a significant economic transition. As a result, Indonesia has become more and more noticeable in the world economy. Recent studies (Wilson and Purushotaman 2003, Indonesia Forum 2007, Buitter and Rahbari 2011) conclude that Indonesia has a promising economic future, and that it has the potential to develop into one of the world's largest economies. And indeed, it seems that its policy is more outward oriented, and that Indonesia is particularly active in the ASEAN network. This way, Indonesia manages to establish a new position in the global economy, and in the booming Asian (super)region. These changes also affect the service sector, which is dependent on human capital and therefore especially footloose.

This recent situation is surprising, because of the country's economic history. Indonesia was late to industrialize. Until 1966 there was an authoritarian regime, and when political change and economic reform were introduced, this resulted in a major change: industrialization and rapid economic growth. This was just in time for Indonesia to benefit from the 1970s oil boom, which caused the commodity prices for its abundant natural resources to rise. In the 1980s, the country started to export industrial output. For the next years, the development and performance of the Indonesian economy was no less impressive than that of the other South East Asian economies. But the 1997-1998 crisis caused another major change. The crisis hit Indonesia hard: it experienced the largest decline in growth compared to other countries in the same region. The economic crisis was accompanied and accelerated by a political crisis, resulting in the resignation of President Soeharto in May 1998, which marked the start of a period of political instability (Hayashi 2005; Aswicahyono et al. 2011).

Despite all this, Indonesia did recover from the crisis. Its comeback suggests a much broader change in socio-economic reality. Looking closer at this, it becomes clear that big steps of development are being taken at various points. This thesis addresses Indonesia's service sector growth, to examine the extent to which this reflects a change for the better, a transition to a more advanced economy.

A general set of societal transformations

In the political realm, there has been democratization after the crisis. Since the beginning of the democratic reforms, the country has held three national elections widely considered as participatory and transparent. The United Nations Development Programme (UNDP 2015) provides the Indonesian Democracy Index (IDI), which complements Indonesia's assessment and monitoring of democratic governance.

Apart from this, change occurred in the very core of the Republic, when the Indonesian Parliament enacted Governance and Fiscal Balance Laws (22/1999 and 25/1999, later replaced by 32/2004 and 33/2004). The goal of these laws is to decentralize both political and economic power. This is a remarkable step away from the traditionally centralized and autocratic system. In a way, the new decentralization aims to recognize the reality of Indonesia, for its territory is highly heterogeneous and the areas of resource abundance are generally not those with political power (IMF, 2015). If those decentralized institutions are well organized and well designed, this can generate more public support and legitimacy for the rule of the Indonesian government.

Another change is that there have been considerable reforms in business licensing. This could help to increase investment to a higher level and support sustainable growth. But there are concerns too, mainly that the implementation of regulations is not yet consistent enough. Some new laws allow for discretion, while international experience is that transparent policies, without (too much) discretion, are the ones that are most beneficial for citizens (World Bank, 2014a).

The World Bank reports that Indonesia has significantly improved access to education. The challenge today is to enhance the quality of education, in order to create a skilled workforce that can make Indonesia more attractive to investment than other middle-income economies. If higher education leads to higher wages, a social multiplier effect is active (Glaeser et al. 2003). Higher salary employment could, in turn, generate an economic multiplier effect.

Another change is the budget reform. From January 1, 2015, a new fuel pricing has been introduced. Subsidies on gasoline and diesel have been reduced dramatically. This has created room for reallocation towards spending on development priorities, especially infrastructure (World Bank, 2015). The need for improvement of infrastructure was mentioned by a wide variety of reports, in which it is made clear that Indonesia does not take full advantage of its growth potential. It was highlighted that insufficient infrastructure constrains growth. The 2014 Avoiding the Trap World Bank report estimates that Indonesia has lost at least 1% of economic growth each year over the past decade due to low investment on infrastructure.

The implications of societal transformations

All these changes point to a structural change in the economy. A change that has many dimensions, and one of them is the development of the service sector. Over the last two decades, the end of the global commodity boom has strongly affected the primary sector, and has put great pressure on management in this sector. At the same time, the economic crisis of 1997-1998 has caused the manufacturing sector to lose its leading position as driver of economic growth. After the crisis, growth in the manufacturing sector decelerated considerably. This sector has recovered only recently, with an increase in investment in the sector and unusually high growth in manufacturing output (World Bank, 2015). But the industrial dynamics have altered quite profoundly (Aswicahyono et al. 2011). The service sector has taken over the lead position in growth, and has kept it ever since (World Bank, 2014b). This might be a sign that Indonesia is moving towards the next stage of development.

This is interesting, because in theories of development the next stage is a stage of deindustrialization, which is associated with a growing importance of human capital. This development goes hand in hand with social innovation, lifestyle change and demand change. If such a transformation is taking place in the Indonesian economy, this will have a strong effect on society at large, just like the start of industrialization had major implications for the Indonesian society. The consequences will be even greater today, because nowadays the economic playing field is more globalized and more influenced by international trade, multinational companies and global branding. Above all, communication systems have improved. This makes it easier to enter the world economy, especially in the service sector.

But at the same time, the economic context has changed. Aswicahyono et al. (2011) note that after the crisis, more barriers have arisen for smaller firms seeking to increase their scale. So small firms stay small, and the same goes for medium sized firms.

It might be that new businesses are started not because of opportunities in the market, but because of necessity. From a Schumpeterian point of view, the decision between a regular job and entrepreneurship is made based on perceived business opportunity. But particularly in developing countries, new firms are started for a variety of reasons. Necessity entrepreneurship can be expected to be related to the early development stages of an economy, because of a need for self-support and lack of employment opportunities (Koster and Rai 2008). The main motivation to start a business, either opportunity or necessity, can carry through to the actual business itself, in the way that it indicates qualitative and quantitative ambition, i.e. the desire to expand, export and to stay in business. When an economy starts growing, there are more job opportunities, which lessens the pressure on necessity entrepreneurship. When the intensity declines, it is expected that quality improves and the types of entrepreneurship should change.

In the very first (and until now only) Global Entrepreneurship Monitor (GEM) report on Indonesia, Nawangpalupi et al. (2014) find that Indonesia has the highest Total Early-stage Entrepreneurial Activity compared to other South Asian countries: 25.5 percent. Thereof, 25 percent of the people starting a business says to be driven by necessity, as opposed to 44 percent that consider themselves as opportunity-driven.

Research problem

The hiatus is that it is still unclear how the higher growth of services, compared to manufacturing growth, must be interpreted. One hypothesis would be that this is an early sign of structural economic change: from a industrialized economy into a knowledge based economy. A competing hypothesis would be that the high growth in services can be explained by necessity-based entrepreneurship. Due to the crisis, firm structure has changed. It may be that there is a lack of employment opportunities and a need for self-support, driving people into service entrepreneurship. This leads to the following research question:

'To what extent does the growth of the service sector in Indonesia reflect a positive explanation of a shift of economy type, and a negative explanation of marginality?'

Based on the first hypothesis, one would expect positive changes in a range of dimensions of a knowledge based economy: sectoral contributions to GDP, participation in the global economy, human capital, and quality of service activities. As for the second hypothesis, dimensions that capture marginality are often qualitative in nature, which exceeds the scope of this research. Therefore marginality is approached as the inverse of progression. This means that we look for negative changes in the same dimensions.

We note that change can be subtle: a shift to a knowledge based economy does not have to mark the end of the primary and secondary sectors. This is especially relevant for the Indonesian archipelago as it has very resource-rich areas and land that is well suited for agriculture because of its volcanic origin. Furthermore, it has a very large labor force that is not trained for service activities.

Operational

In order to find an explanation for the relative blossoming of the service sector, a broad perspective is required. Service activities are by nature highly heterogeneous. This defies the application of one principal theory, a particular analytical method, or a dominant mode of interpretation (Daniels, 1985). It is necessary to find out what characterizes the service sector, recognize different indicators and test the correlation between these particular indicators and the aforementioned growth in the service sector. In this thesis, this will be done on a national level and a regional level.

The idea of economic development is that eventually a new type of society is formed, commonly labelled post-industrial (Touraine, 1971; Bell, 1974; Gersuny and Rosengren, 1973). It has also been variously referred to as 'high tech', 'sunrise', 'knowledge based' or 'information based' economy. Bell (1974) points out that the change is not only economical, but also visible in occupational distribution, future orientation, decision-making and in the centrality of theoretical knowledge as the source of innovation and of policy formulation for the society. This has many of implications for individual firms, and both the regional and national economy.

National level

There is a very diverse range of service occupations. The division of service workers over these occupations might point to a broader trend. The aspects that are of importance here are labor intensity and human capital. In a more knowledge based economy, skills are the main commodity. This would cause a decrease of labor intensity and changing preferences on the labor market as certain skills are required. These two processes stimulate clustering and urbanization. On the one hand because companies want to benefit from a skilled labor pool. On the other hand, will the availability of (quality) jobs stimulate migration of workers. Questions to be answered are:

- To what extent are signs of change visible in Indonesia's economy structure?
- If the economy is more knowledge based, one would expect there to be a larger emphasis on knowledge. Is this to be found in the educational backgrounds of service workers?
- A knowledge economy would suggest more international connection, joining in globalization. Do we see that for Indonesia?

Regional level

There are spatial variations in the distribution, structure, productivity, and growth of service activities. Hill et al. (2008) find an interaction between the international economy and local development. The regions that are most connected to the world economy are likely to grow the quickest. These are also the desired locations of multinational firms. This may lead to clustering and increasing returns to scale. Indeed, there has been a clear shift of economic activity from various parts of Indonesia to Java and Bali. To be more specific, the big provinces of Jakarta, West Java and East Java account for half of Indonesia's GDP (Hill et al. 2008). However, the center of economic growth is not just Jakarta. McKinsey Global Institute (2012) reports that many other Indonesian cities are growing more rapidly, although from a lower starting point. These cities include Medan (North Sumatra), Bandung, Surabaya, as well as parts of Greater Jakarta such as Bogor, Tangerang, and Bekasi. Because the Java and Bali economies are the most advanced, it is likely that structural change will occur on these islands first. So the expectation is that signs of deindustrialization are the most noticeable here. Taking on a regional view allows us to test this best, because this approach will eliminate the counter weighting effect of islands that are mostly based on resources.

As both globalization and localization are increasing, location is crucial. The trend is that the international convergence is slow, but intra-national gaps are widening. In advanced economies spatial transaction costs for routine, non-knowledge intensive activities have fallen. Non-routine, knowledge intensive activities have high spatial transaction costs which drives the clustering of knowledge to cities (McCann, 2013). In theory, cities are frequently considered to be the prime areas for the generation of growth and the creation of wealth (Sassen, 1993). What drives this concentration of activity is the availability of human capital, innovation, creativity, and a higher level of entrepreneurship, but also hard and soft infrastructure. Cities can accommodate localization economies of specialization, and urbanization economies of diversity. The first are associated with fast growth, and the latter with long-term, stable growth (Jacobs, 1984). The quality of regional institutions might also affect development, but Hill et al. (2008) find mixed and incomplete evidence of this.

Service activities are about adding value to a process. The quality of those activities is important, but as output is often intangible, this is difficult to measure. The approach is to study the services that provide knowledge intensive input to other firms' business processes, as these are an important characteristic of a knowledge based economy (Miles, 2005). Furthermore, we test for a range of indicators that address a level of efficiency and productivity. Questions to be answered are:

- How are knowledge intensive service activities spread over space? Clustering patterns could suggest the existence of localization economies, that give opportunities for long-term, stable growth. If knowledge intensive services are evenly spread, this suggests a small geographical service range and little economic significance.
- As urbanization economies of diversity encourage long-term growth, a successful path of deindustrialization would need a mix of professional activities. Is service sector development linked with other economic activity? And to what extent is knowledge intensive service growth dependent on other flourishing sectors?
- To what extent can clustering of knowledge intensive services be related to overall growth?
- Advanced, knowledge intensive firms need matching technology inputs. Is there a noticeable decrease in labor intensity that could implicate a shift towards knowledge intense activities?
- Do we see evidence of a government policy that is stimulating knowledge intensive services, by providing appropriate physical infrastructure?

Chapter 2 | Theoretical framework

National economies are often analyzed by examining their components, also known as sectors. Traditionally the Clark-Fisher three-sector model is used to differentiate between a primary, secondary and tertiary sector (Fisher 1935, Clark 1940). The primary sector includes activities that extract resources from the earth, for instance agriculture, fishing and mining. The secondary sector is transformative: goods coming from the primary sector are processed. This includes construction and public utility industries, and most importantly the manufacturing of goods. The tertiary sector includes services, ranging from trade and transport to insurance and business services, and from medical care and education to catering and entertainment. In this chapter, the theory of service sector development, its dimensions and consequences are further explored. This starts with the essential question what services are. After that the role of services in the economy is discussed, and the characteristics and implications of development into a knowledge based economy.

The nature of service industries

As in this thesis we study and describe the service sector, it is necessary to define what services are. In literature, the term has been approached in many ways and there is no consensus on what it means. Even the three founding fathers of the three-sector model give different definitions of the sectors and that has caused controversy (Gershuny and Miles, 1983). Even though there is not one single definition, there are some characterizing features in the nature of service industries.

Daniels (1985) starts with the notion that a service is 'the exchange of a commodity, which may either be marketable or provided by public agencies, and which often does not have a tangible form'. Service output is relatively impermanent of nature: services seem to 'pass out of existence at the same instant as they come into it' (Gershuny and Miles 1983; Greenfield 1966,7). However, services can be of long term value, for instance when it concerns advise or design. According to Thomas (1967), another characteristic of services is that services are often of a personal, tailored nature and tend to require some personal skills. Service products are often classified by their destination: services to other businesses are called producer services. Often these services are intermediate products. The opposite of producer services are consumer services.

It is difficult to specify the boundary between service and non-service activities. Stigler (1956) is clear about the fact that there 'exists no authoritative consensus on either the boundaries or the classification of the service industries'. The boundaries are difficult to indicate because service industries cover a wide range of products, that are not necessarily produced by the service sector. In other sectors, like manufacturing, service products accompany the production process. They are usually embodied in the manufactured goods, but can also be sold on their own (Gershuny and Miles 1983). Households can also provide service products. The span and importance of these domestic services in the (informal) economy depend on household and labor force compositions, and of related labor market institutions.

It is clear that the classification of firms by main industry doesn't give enough credit to services. In many cases, services go hand in hand with classic industrial activities, to the extent that activities are so entangled that one is not possible without the other. This happens for instance with transport

services, but also with sophisticated financial services. But that is not the only reason why the effect of services can be overlooked.

Development theories

A well-known spatial economic approach to regional development is that of multiplier models, especially the economic base models. In Sombart's economic base model, there is a crucial difference between basic (driving, exogenous) and non-basic (caring, endogenous) activities. Regional growth is equal to the sum of both, but the last category is dependent on the development of the basic sector.

Services have often been categorized as being solely non-basic in nature, and therefore passive. Kindleberger (1958) states that when an economy is growing as a whole, the service sector increases its size relative to the rest of the economy. The explanation is that the wealthier people are, the more services they consume. On the one hand this way of thinking is understandable, because services comprise often the solutions for all kinds of problems that arise in firms and households. On the other hand, this ignores the driving forces of investment, export services, and tourism, and results in underappreciation of the job-creating potential of service industries (for instance in Clark, 1940). The recognition that services have a position in their own right, and are crucial in development, came when services took a flight (on complementarity see Oberai, 1978; Stanback, 1979).

Evolving insights on developmental paths

As the service sector grew, nurtured by the economic prosperity of the post-war boom (1950-1970), scholars speculated about the characteristics of developmental paths. Stronger services were linked to a new type of society which was called a post-industrial, high tech, sunrise, information- or knowledge based economy (Touraine, 1971; Bell, 1974; Gershuny and Rosengren, 1973). This led to a fascination with the question that was not answered by the creators of the ever famous three sector model: where this service sector growth would stop. Gershuny (1978) enumerates:

“Rostow asks where we go from the stage of high consumption of material goods; Bell answers that we pass on to the next category of consumption, the consumption of services; Dahrendorf similarly though in different terms, that we pass to the public provision of non-material products, education and leisure activities; Schumacher, that we turn our attention to social and spiritual values. Galbraith, rather differently, sees the trend as ever-increasing material consumption, but only as a result of the machinations of the great post-capitalist corporations of the ‘planning system’ for whom economic growth is a requisite of survival.” Gershuny 1978, p. 141-2.

Gershuny and Miles (1983) are correct when pointing out that these post-industrial theories might be troubled by the zeitgeist. After all, they were formulated during the golden age of twentieth century capitalism. Under the Bretton Woods system the Westernized economies changed rapidly, most importantly by automation in manufacturing, the introduction of new distribution systems, the improvement of highways and the rise of commercial aviation. The post-industrial theories are progressive and stress that automatization will replace workers, and that the service sector will provide adequate employment opportunities to compensate (as solution for the problems in other sectors).

Because changes occurred so fast, the future was difficult to forecast, and the importance of automatization might have been overestimated.

In recent years, the knowledge based economy is viewed as a phenomenon, not so much as an end stage. That means that the term is used to underline the fundamental difference with earlier types of economy, but also that there is a large grey area between an industrial and a knowledge based economy. And there is eye for the individual developmental path of countries, especially the extraordinary cases of India and China (Iimi, 2004). Apart from that, it is recognized that the innovation process differs considerably across sectors (Todtling et al 2006).

In academic literature there is widespread agreement that innovation, knowledge and learning have become the main drivers of wealth, employment and economic development in more advanced regions and countries. Lundvall (2000) explains that the knowledge-based economy does not rely on the sum of all knowledge ever created. In fact, it is not even sure if the amount of relevant, useful knowledge has radically changed.

“(...) the last decades have been characterised by an acceleration of both creation and destruction of knowledge: information technology has made much information more easily accessible to many people, but it also has rendered many skills and competencies obsolete. What is really new is the rapidity of change; for economic success today, the possession of a specific, specialised knowledge base is less important than the ability to learn and to forget. For individuals, firms, regions and national economies, success in the current market economy requires rapid learning and forgetting (as old ways of doing things often hinder efforts to learn new ones).” (Lundvall 2000, p. 126)

This reflects a Darwinian approach to the intensified pace of scientific and technological progress, where responsiveness gives the best chances of survival. And that is logical, given the fact that there is an evolution and changes do not occur all at once. Eichengreen and Gupta (2013) identify two waves of service sector growth. The first happens in countries with relatively low levels of per capita GDP, and consists primarily of traditional services (such as transport, storage, retail and wholesale trade). The second wave hits when per capita incomes are higher, with knowledge based services (financial, communication, computer, technical, legal, advertising, and business). These are the services that have international potential as well.

Their argument is that the second wave occurs at lower income per capita levels than before. Especially in countries that are open to trade, democratic, and that are relatively close to the major global financial centres. This is in line with the common notion that in the modern world economy regionalism, especially supranational regionalism, is important in order to capitalize on the opportunities of a globalizing, knowledge based economy. In Indonesia's case this means an active partnership with other ASEAN countries.

The simplicity of the Clark-Fisher model explains transitions clearly. But it is important to mention that the development of a country does not need to be linear. There is more to development than the dominance of one of three sectors. The effect of a more dominant service sector on the economy depends on a variety of factors: the internal structure of the service sector, geographical and climate

differences, urbanization and cultural factors. But also government intervention and international trade play an important role (Gershuny and Miles, 1983).

Apart from that: the rapid expansion and increasing dominance of service activities does not automatically point to maturity in their development. Firstly, often labor intensive service activities precede (and later accompany) more knowledge based service activities. So before the economy can become more advanced, a certain social and economic infrastructure must be built, mostly by public institutions such as hospitals, schools, transport services, postal and telecommunications. Secondly, the nature of services implies low elasticity of factor substitution. This means that as the economy grows, there is more scope for entry into unskilled but labor-intensive services. And thirdly, the growth of manufacturing output brings an employment multiplier which causes government and commercial services to rise (Oberai, 1978; Daniels, 1985).

The special role of knowledge intensive business services

The presence of services that provide knowledge intensive input to other firms' business processes are an important characteristic of a knowledge based economy (Miles, 2005). These knowledge intensive business services (KIBS) include computer services, research and development, accountancy and management services, architecture, engineering and technical services, advertising and market research and legal services.

As KIBS are built around the need for tailored knowledge products, KIBS are often perceived to be functioning as facilitator, carrier or source of innovation. Studies show that KIBS contribute to the creation of employment, the increase of production levels and the promotion of investment (Delgado-Márquez and García-Velasco, 2013). Strong growth in these services reflects the use of advanced organizational strategies that focus on core competences and that outsource other activities. It also captures the fact that social conditions and technologies change and that firms need help with that, as well as a growing attention to the intangible aspects of production and trade, and the wish to improve their business. That causes a need for specialist, knowledge intensive input.

Additionally, how are knowledge intensive business services defined? As this selection of services is meant to provide intermediate products, they belong to the Producer Services group in the traditional Browning-Singemann (1978) sectoral classification of the service sector. But only a selection of the producer services classifies as knowledge intensive. Miles (2005) creates a classification in European NACE (Nomenclature statistique des Activités économiques dans la Communauté Européenne) codes. This list, included as appendix 1, is the basis for the classification in Chapter 3 of this thesis.

Incorporating knowledge into economic theories

What does being knowledge based mean in the economic reality? In the OECD countries, it is visible that the use of new technologies sets a new, higher standard for skills in the labor force in both manufacturing and services. Jobs disappear in the manufacturing sector, while employment is growing in high-technology, science-based sectors.

David and Foray (2002,2003) stress that although science and technology have a central role in the knowledge based economies, these economies are not restricted to the field of high technology. The trend of an increase of jobs in the production, processing and transfer of knowledge and information has gradually spread across the entire economy. That explains why the demand for knowledge workers is the highest in a wide range of activities. (OECD, 1996)

These trends are leading to revisions in economic theories and models. Traditional production functions focus on labor, capital, materials and energy; knowledge and technology are external influences on production. Now analytical approaches are being developed so that knowledge can be included more directly in production functions. According to the neo-classical production function, returns diminish as more capital is added to the economy, an effect which may be offset, however, by the flow of new technology. Technological change raises the relative marginal productivity of capital through education and training of the labor force, investments in research and development and the creation of new managerial structures and work organization.

In the new growth theory, knowledge investments are characterized by increasing returns. Investment in knowledge stimulates more efficient production and organization methods, as well as the creation of new and improved products and processes. This is seen as the key to long term economic growth. Knowledge can also spill over from one firm or industry to another, with new ideas being used repeatedly at little extra cost. Such spill overs can ease the constraints placed on growth by scarcity of capital.

Incorporating knowledge into standard economic production functions is not an easy task, as this factor defies some fundamental economic principles, such as that of scarcity. Knowledge and information tend to be abundant; what is scarce is the capacity to use them in meaningful ways.

Implications of a transition to a knowledge based economy

When over time the relative sizes of the economic sectors change, this indicates a structural change of the economy. This directly leads to a shift in the demand of labor. But indirectly, such a structural change can have major consequences for society at large. Of this, history shows us many examples. For instance the Industrial Revolution, that not only led to the emergence of a new social structure of working, middle and upper class, but also to rapid urbanization and new urban problems (especially in England).

With changing economic power relations, the playing field is altered, and new societal issues and discourses arise. This leads to transformations of lifestyle and demand, which can magnify gaps and differences between segments of the population. That is where questions about wealth, (urban) wellbeing and inclusiveness arise. But also demographic changes take place, for instance smaller family sizes and an increase of female employment. And often growth in the informal economy, as the rest category. These factors prompt economists and economic geographers to be aware of early signs of coming change, and to study them in order to explain and predict.

To accommodate growth, developing countries need appropriate economic systems, but also a secure political foundation. This provides the trust needed for investment. The challenge is that on the one hand this requires a strong state, with institutions to protect property rights and enforce contracts. But the power of the state has to be subject to self-control and self-discipline: the ability of the state to confiscate wealth must be limited and the state must be committed to honor economic and political rights.

Democracy and economic development

One question is if democratization leads to economic development. The large players on the world market are mostly democratic, but that does not mean that this political system is the golden ticket to growth. Persson and Tabelli (2006) analyze research on this question and conclude that the answer is

largely positive, but this depends on the details of democratic reforms. Countries that, like Indonesia, liberalize their economy before extending political rights do better (UNDP, 2015). But governmental styles and thus policies make a difference too. This might explain the faster growth in presidential democracies like Indonesia, compared to that in parliamentary democracies (CIA, 2015). The third crucial detail is that investors react on expected political reforms, not the actual ones. Higher expectations lead to stronger growth effects.

Decentralization and economic development

The industrial growth of India and China has been accredited to institutional change, specifically decentralization (as summarized by Iimi, 2004). This is often seen as a way to make a government more efficient and responsive to the felt needs of the majority of the population. On an organizational level decentralization takes place through the fragmentation of authority and the increase of competition, and on a social level by the increase of local autonomy, which may reduce social and political tensions.

However, the influence of decentralization on economic development is elusive. The idea of decentralization is that the power rests with the people who have the right information and feel responsible for the outcomes of their decision making. Local accountability is the key factor, but Bardhan (2002) points out that one should keep in mind that these structures are not in place in many developing countries. Often local governments are at the mercy of local power elites, and this may frustrate the policy goal of delivery of public goods to the general population. Whether in the sense of the provision of social services, the creation of infrastructure facilities or the stimulation of conditions for business development. Those structures of power need to be changed for decentralization to be really effective.

Development and FDI

In a globalizing world, multinational enterprises play a critical role. This is because multinationalism and the implied foreign direct investment increase the inter-connectedness of economies. The structure and dynamics of the world economy are more and more influenced by FDI that is closely linked with financial flows, technology transfer, and international trade in services and goods. This calls for more advanced business services. It is often said that FDI is an important element of economic development in developing countries (for instance by the final report on a conference on development: UN 2002, p. 5).

The theory behind that statement is that developing countries benefit from FDI in multiple ways: directly through the inflow of capital, tax revenues and employment, and indirectly through spill overs of technology and know-how to local enterprises and workers, and through access to foreign markets. Because locals learn from the contacts with foreign investors, they require skills to be able to better compete on the global market. Another indirect effect is that the arrival of international enterprises challenges the competitive industry structure, by taking their share of the market. The effect is two-sided: on the one hand local enterprises are *challenged* to improve their efficiency and productivity, and this might take the overall industry structure to a higher level and eventually create a higher growth rate. On the other hand, this might crowd out local enterprises and in this way, FDI can be detrimental to economic development. Foreign enterprises are often significantly superior to domestic enterprises and either buy out or drive out domestic firms, leading to a concentration of power in the industry.

Many academics have studied the effect of FDI on factors that promote economic development, but with contradictory results. Reiter and Steensma (2010) elaborate on this and conclude, based on Agosin and Mayer (2000) that whether FDI has a positive or negative effect on economic development, depends on variables such as the sector in which it operates, the ability of locals to participate and learn from foreign investors, and the ability and willingness of host governments to use FDI with development in mind. Policies can make the difference in positioning FDI for the benefit of the country.

One would expect a developing country to attract a great amount of FDI, and become more and more part of the world economy. Because there is no clear causation of FDI on economic development, an analysis of FDI is only used as an indicator of international connectedness and trust, and as an indicator of need for advanced business services.

Developing countries, in particular, have created an environment that is increasingly amenable to foreign investors (UNCTAD, 1999). Government policy changes have made it easier for foreign investors to enter a wider variety economic sectors and establish operations. Many restrictions on foreign equity participation and ownership have been removed.

The spatial behavior of knowledge intensive services

It is often assumed that knowledge intensive firms and activities have strong propensity to concentrate in geographical space (Todtling et al. 2006 list some evidence). This is especially so in the early stages of industry development, when according to the cluster life cycle hypothesis (Swann, 1998) proximity is vital. When an industry matures, economic activities will become more geographically dispersed.

The source of this clustering in the knowledge intensive services can be explained by Marshalls' (1890) theory of agglomeration economies. Like-minded firms, in particular specialized firms, achieve increasing returns to scale in the cluster, due to knowledge spill overs, local non-traded inputs and a local skilled labor pool. Or, according to Duranton and Puga (2004), learning, sharing and matching processes. Particularly in the early phases of clustering, the learning effect is a key factor to explain spatial clustering in knowledge-based sectors (Todtling, 1994).

Den Hertog (2000) stresses that in knowledge intensive business services, the learning effect works both ways. Production of knowledge is often the result of cooperation between a client and a service provider. Consequently, this is all about interaction and communication, where the service provider enables innovation in the client's business process and the client can improve services through the learning effect of feedback. Overall we know that the creation and distribution of tailor-made service products is essential to knowledge intensive business services. As the transaction of tacit knowledge requires trust, understanding, frequent communication and face to face contact, geographical proximity is crucial for efficient knowledge transfer of KIBS.

Spatial proximity makes co-operating easier, and not only in a commercial business to business situation. Overall the transaction costs in looking for information decrease, and it becomes possible to organize fast solutions for technical problems, to share specialist labor, and to align activities to each other's production schemes (Scott, 1988). The use of market relations whenever possible while keeping internal structures unchanged enhances productivity and efficiency.

Another advantage of proximity of similar firms is found in the so-called 'monitoring advantages'. Firms are able to observe their competitors directly and over a longer period of time. This allows them to

imitate them and combine the competitors' ideas and solutions with their own. This enhances knowledge creation and innovation (Malmberg and Maskell, 2002).

Development and infrastructure

The high spatial transaction costs of non-routine, knowledge intensive activities direct clustering to cities. This stimulates urbanization, and this in turn stimulates the growth of the local service sector because greater urban density creates space for new specialist firms, as well as it facilitates the organization of service transactions at a larger scale (Findlay and Pangestu, 2016). As a result, cities are frequently considered to be the prime areas for the generation of growth and the creation of wealth (Sassen, 1993). But evidently, clustering and the associated urbanization effect put major pressure on infrastructure. To maximize the mobility of economic factors on a national scale, connectivity between economic centers is indispensable. Not only for trade competitiveness, but also for future growth. In fact, it was made clear that Indonesia has been losing at least 1% of economic growth each year over the past decade due to low investment on infrastructure (World Bank, 2014).

Porter (2000) elaborates on the roles that government plays in an economy. Aside from its most basic role to achieve macroeconomic and political stability, a second important role is to improve general microeconomic capacity. This implies improving the quality and efficiency of general-purpose inputs to business processes and firms. An example of this is providing an appropriate physical infrastructure. A third role is to encourage productivity growth through microeconomic rules and incentives governing competition. And the fourth is to develop and implement a 'positive, distinctive, long-term economic action program, or change process, that mobilizes government, business, institutions, and citizens'. The priorities of these government roles change as a cluster develops and matures. But essential to cluster development, especially in an early stage of cluster development, is to eliminate infrastructure, human resource and regulatory constraints that impede productivity and innovation (Porter, 2000; ADB, 2012).

The spatial pattern of development

Clusters do not arise randomly. There must be a reason why some places become clusters and serve large market areas, and others stay small. A number of things are important here, such as the cost of transportation, as proposed by A. Weber in 1909. But Christaller's (1933) central place theory illustrated the locational patterns of settlements differently. The key is that each good or service needs a certain market area to be economically viable and will from that point try to expand its market area until the maximum distance that consumers are willing to travel to them. Lower order settlements provide with goods and services that are purchased more frequently, and are distributed evenly. Higher order places provide more goods and services, including more specialized goods and services.

Agglomeration economies have their own role in this. When service clusters get stronger and more intertwined, this results in a service structure where everyday services are provided on a large scale, and specialized, knowledge intense work is clustered. The expansion of producer services is therefore contributing to extensive restructuring of the system of cities (Stanback and Noyelle, 1982). Development will start in these central places, and from there, be transported to lower order places. This calls for well-working social, technical and physical infrastructure, to make the most of opportunities in the higher order places.

Conclusion

There is a wide variety of service sector activities, and there are many dimensions to them. In this chapter we have seen that the two possible explanations of service sector growth, either a shift towards a knowledge based economy or marginality, can be related to different types of service activities. Although service outputs of both kinds are often intangible, the difference addresses quality.

In knowledge based economies the main drivers of wealth, employment and economic development are innovation, knowledge and learning. These are the factors that we will search for in the Indonesian service sector. An important characteristic of knowledge based economies are knowledge intensive business services, as these are typically involved with the creation and transfer of innovation and knowledge. And not only because of their activities, but also because growth in knowledge intensive business services reflects a larger trend of technological change and specialization in society.

These knowledge intensive business services tend to cluster in geographical space, to benefit from agglomeration effects and to improve their service quality even more. Marginal service activity is much more scattered. And there is another important difference. As knowledge intensive business services have the capacity to be drivers of wealth, employment and economic development, they are often linked to other activities, but not so much dependent on them. Marginal service activity misses that power and will typically only follow demand. If knowledge intensive business services are in fact growing and clustering, this would invalidate to a large extent the marginality explanation. Therefore we focus on the knowledge intensive business services in the Indonesian economy.

Chapter 3 | Data and strategy

This thesis' research goal is to explain the service sector growth in Indonesia, either positively by deindustrialization (moving to another type of economy), or negatively by marginality (necessity based entrepreneurship). Evidence of this can be found by analyzing a diverse range of dimensions of Indonesia's developmental path. Among these are the role of services in the national economy, participation in the world economy, the role of human capital, the quality of services and its labor intensity. For each dimension at least one indicator is studied, some on a national, others on a regional level. The sequence follows these levels, splitting the analysis in a national level analysis and a regional level analysis. As there are many definitions of the service sector, an important part of this chapter concerns the definition and operationalization of 'wide variety services', and 'knowledge intensive business services'.

In the first place it is necessary to collect more detailed information on service sector development. This will provide us with more general knowledge about the change in the economy in the past years, from a national perspective. Then two aspects of knowledge based economies are tested, starting with the extent of participation in a globalizing economy, measured by levels and destinations of FDI. The second aspect is the core of a knowledge based economy: the emphasis on human capital. This last aspect will be approached from a labor market perspective.

On a regional level, we want to test the quality and relevance of services. As service output is often intangible, this is difficult to do. Therefore, different indicators of quality are used: in the first place the location and density of knowledge intense business services, indicating their spatial range and level of operation. Another indicator of quality is regional performance. In a developing sector, the most productive and efficient firms survive. This is especially true when foreign firms enter the market. Other dimensions of development are sustainability of growth, tested by the existence of urbanization economies, and labor intensity.

National level analysis

General characteristics

In order to obtain a better understanding of Indonesia's development path, it is important to examine the country's economic structure. The aim is to zoom in on the Indonesian economy and to determine which sectors are the main actors of growth. Therefore, it is necessary to look at the development of the service sector in comparison with other sectors, and at the country's service sector contribution to the GDP.

To put this into perspective, the role of services is compared with that in other developing countries. To keep the analysis clear and concise, the comparison is limited to the often used acronyms by Jim O'Neill: the other MINT and BRIC countries. These are Mexico, Nigeria, Turkey; Brazil, Russia, India and China.

The development of services data can be derived from the World Bank database (World Development Indicators). In this database services correspond to ISIC divisions 50-99. This includes a wide variety of service activities: wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services. Also included are imputed bank service charges, import duties, and any statistical discrepancies noted by national compilers as well as discrepancies arising from rescaling.

International connectedness - FDI

Another dimension of moving to another economy type is that economies increasingly participate in globalization, and if the positive concept is close to the truth, we would expect more international connectedness for Indonesia. Associated with this dimension are international trade, the amount of international treaties and foreign direct investment (FDI). FDI is the cross-border direct investment of equity in an enterprise, associated with a significant degree of influence by the investor. This more or less sustainable international participation is the most accurate indicator of international connectedness. A strong connection would not only point to international links, but also suggest international relevance, and international trust in the knowledge intensive services.

Ideally, one would test the extent of foreign direct investment (FDI) flowing to knowledge intensive service areas. This would directly show the international connectedness of these service areas. With the available data, coming from the World Bank database, a general analysis on the history of FDI in Indonesia can be performed (from 1981 on). To position the results, the current situation is compared to the other MINT and BRIC countries.

More detailed information on FDI trends is derived from the national investment board, BKPM. This provides more insight into the physical and sectoral destinations of FDI. A simultaneous analysis of both cannot be performed. This is not problematic, because we use FDI merely as an indicator of international connectedness and catalyst for business services and not as fundamental characteristic of a transition to a knowledge based economy.

Education

An important characteristic of a knowledge based economy, is the emphasis on human capital. More and more, knowledge is seen as a commodity. Whether this is true for Indonesia can be investigated by assessing if an evident increase in higher education enrolment is visible, and by looking at the characteristics of the labor market. As we know that improvement of the education system is a factor that often, but not necessarily, precedes development, focusing on these numbers gives the wrong impression. It is better to focus on employment, in particular the share of knowledge workers in the (wide variety) service sector. A second point of research is the intra-sectoral service employment of the highly educated. That way, the outcomes are put into perspective (of leading capacity) and indicate the accuracy of the regional level analysis that specifically concerns knowledge intense business services.

The national statistics institution, Statistics Indonesia (BPS), monitors the relationship between industry type and educational attendance. The data are available from 2000-2014. As industry categories are preselected, these data are less specified than the Indonesian Economic Census data. However, these data might indicate a shift of power relations on the labor market.

In 2000-2001 the service sector categories were:

- (1) Wholesale Trade, Retail Trade, Restaurants and Hotels,
- (2) Transportation, Storage, Communication,
- (3) Financing, Insurance, Real Estate and Business Services,
- (4) Public Services.

From 2002 on, the categories have been slightly different:

- (1) Wholesale Trade, Retail Trade, Restaurants and Hotels,
- (2) Transportation, Warehousing, and Communication,

- (3) Financing, Insurance, Real Estate, and Business Services,
- (4) Community, Social, and Personal Services.

Especially the last category might have a different scope. In the new categorization there is no rest category, so the former category of public services should be captured by the last category.

Indonesian higher education institutions include universities, academies, institutes and polytechnics, resulting in diplomas I/II/III, academy and university degrees. In most years a distinction is made between university degrees and the other higher education degrees. Some higher education is of a practical kind, and quality of degrees can differ. That is why the main focus in this thesis will be on university graduates.

Regional level analysis

Service industries are associated with a knowledge based economy. Among these, it is the knowledge intensive services that are seen as drivers of innovation. These services are sources and carriers of knowledge that can influence and improve the performance of organizations, value chains and industry clusters across all sectors.

Defining service industries in the census

In the first phase of the Indonesian Economic Census, the industry categories are broadly defined. In the second phase, a very detailed category determination is made based on the United Nations International Standard Industrial Classification of All Economic Activities (ISIC): In both the 1996 and 2006 census, an Indonesian Standard Industrial Classification is used. In the 1996 census this classification is called 'KKKP', and this division is based on ISIC Rev. 2. The 2006 division, 'KBLI' is based on ISIC Rev. 3.1. A list of all used service activity codes is included as appendix 2.

Because this research focuses on knowledge-intensive business activities, the main categories of interest are (ISIC Rev. 3.1 codes) J (Financial intermediation) and K (Real estate, renting and business activities). In category J (financial intermediation) all activities fit the criterion. In category K we exclude a few less knowledge intensive market services: real estate rentals (70101) and boarding house rentals (70102); tourism object exploitation (70310 and 70320); the renting of transportation vehicles (71110, 71120, 71130); rental of agricultural machines, constructions, office, and other rentals (712); rental of household and personal equipment (713); office cleaning services (74930), photography (94940); wrapping and sealing (94950) and a rest category including stenography, photo copy, answering phones (94990).

The production activities C, D, E, and F can be filtered out, as well as the distribution activities G, H, I. The last part of category I (Transport, storage and communications) is telecommunications. This might be knowledge-intensive. However, hardware and software consultancy, data processing and data base activities are captured under category K (Real estate, renting and business activities). Included is commercial education that keeps workers' knowledge up to date: 'other skill training' (M 8092).

Then the public sector services: Public administration, defense, social security, education, health and social work, and community services. Of these, education, health and social work, and community services are considered to be knowledge-intensive (Miles, 2008). It is well known that Indonesia is working hard on access to education, and that the government introduced a health insurance system, locally known as JKN, in 2014 to provide all citizens and residents with access to basic health coverage by 2019 (Anderson et al., 2014). The structure of society changes from the inside, and that is of great importance to the long term growth of the economy. But to assess the shift to a knowledge intense

economy, it is more valuable to focus on the areas that have leading capacity in economic change -- on the more independent, variable factors – the knowledge intense business services. The knowledge intense public sector services are excluded.

It is important to keep in mind that for allocation to an industry category, the determining factor is the *main activity* of the establishment or enterprise. This way, internalized service activities, although of great importance to firms, will be overlooked.

Location

The first indicator of quality of service activities is location. How are knowledge intense business service firms spread over space? We know that KIBS can be important in enhancing employment, production levels and investment (Delgado-Márquez and García-Velasco, 2013). But also that to be successful and efficient in the transaction of (often tacit) knowledge, proximity is important. This stimulates clustering, and the accompanying agglomeration advantages. This is associated with efficiency and specialization, the effects of which can result in fast regional growth.

Clustering can be tested by performing either a location quotient (LQ) analysis, or calculating the (knowledge intensive business service) share of regional economic activity. The LQ is more precise, because it puts the shares in national perspective. The data provide this information, which is why an LQ analysis is used. After selecting the knowledge intensive business services, the results can be showed in GIS. There are two sets: based on the 1996 and the 2006 data.

The degree of clustering in knowledge intensive business services can be analyzed by performing a location quotient analysis. In a location quotient model regional level values are compared to the same categories on a national level:

$$LQ = \frac{E_{ir}/E_r}{E_{in}/E_n}$$

Where E_{ir} and E_{in} represent the number of establishments in service sector i on respectively a regional and national level. E_r and E_n represent the total numbers of establishments on a regional and national level. A location quotient over 1 means that a region has a higher concentration of establishments in a particular industry than the national average.

Based on the location quotient, we can define core, intermediate and peripheral areas. Most likely core areas will have a location quotient of at least 1.2, intermediate will be between 0.8-1.2, and peripheral areas will have a location quotient of 0.8 and less (this is a common way of presenting LQ results, see for instance StatsAmerica, 2015).

Questions to be answered are:

- What factors determine these clustered areas? To what extent can they be related to growth and other (developmental) indicators?
- What factors cause knowledge intensive business service activity growth?

As we are particularly interested in a shift of economy type that has a big impact on society and is connected to a certain change in social innovation, lifestyle and demand, it is interesting to test if a social multiplier can be identified. This could be measured by the influence of KIBS on regional wages (in line with Glaeser, 2003). Other approaches are linking KIBS to welfare, employment or the number

of establishments. With the available data, it is possible to compare service clusters to the regional growth of the number of service establishments, to find out if there is a relation between the two.

Linear regression requires a continuous character of the dependent variable (ratio/interval) and normally distributed results. As the results are strongly influenced by outliers, this must be tested carefully. Another model-related difficulty is that when comparing regions, there might be endogenous effects, troubling outcomes. The so-called 'reflection problem' arises, according to Manski (1993), when a researcher observing the distribution of behavior in a population, tries to infer whether the average behavior of the population influences the behavior of individuals in that population. This is also applicable to economic analysis, in the way that one could wonder whether and to what extent the national numbers reflect or cause regional characteristics. Fact is that there are endogenous effects. In order to compensate for the interrelatedness of regional data, a spatial economics model is used.

As urbanization economies of diversity encourage long-term growth, a successful path of deindustrialization would need a mix of professional activities. Is knowledge intensive service sector development in the core regions linked to other flourishing sectors?

On explanatory variables and expectations

To complement the arguments on either development of the economy or marginality of services, a number of explanatory variables is included.

The first are factors that see on the presence of other industries in the region: regional shares (E_{ir}/E_r) of other sector rates (i.e. manufacturing, oil and gas) and unrelated variety and related variety (for the number of establishments). We want to know what economic spheres typically accompany the clustered areas. And what other activities might explain the need for knowledge intensive services. Specifically, to what extent the knowledge intensive clusters show signs of urbanization economies, that are associated with long-term, stable growth (Jacobs, 1984).

The variables unrelated and related variety are derived from Fahmi et al. (2016). Both of the variables reflect urbanization economies, especially regional economic diversity and cross-fertilization. The idea is based on Frenken et al. (2007), who distinguish between variety as a source of regional knowledge spill overs (associated with related variety), and variety as a strategy to protect the region from external shocks (associated with unrelated variety). Fahmi et al. (2016) explain:

“Unrelated variety is an entropy index measured at the 2-digit class of KBLI codes, and indicates diversity between sectors. Related variety is the weighted sum of the entropy index measured at the 5-digit level within each 2-digit class of KBLI codes. Related variety thus represents the diversity within each sector, [...]” (Fahmi et al., 2016, p. 70).

The second series of explanatory variables are labor market factors: the level of self-employment, the level of unemployment, and the percentage of higher educated people. Knowledge intensity and urbanization should be connected to both higher levels of self-employment and higher levels of university graduates. Unemployment should drop, because in the cluster people are matched to their jobs. At the same time, we know that urbanization is a threatening force too. These clusters could be harsh environments in which necessity based entrepreneurship and unemployment rise.

The third are factors that point to the ideas of urbanization effects and the efficiency that is associated with clustering: population density and average firm sizes. Both are expected to reach higher levels inside of the cluster.

The next factor is not included in the general regression model, because of the number of errors in the data. The regional shares of infrastructure expenditure is included in the overall analysis, because this shines a light on the governmental role to encourage knowledge intensive clusters. If the government acknowledges and stimulates the clustering of knowledge intensive business services, we would expect to see matching effort to increase physical connectedness. We know that there is an overall need for improvement of infrastructure in Indonesia, but still we would expect to see that the clusters are prioritized, for these are supposed to be the areas of potential growth.

Apart from that, we look for a change in the level of labor intensity. This is often measured in comparison with the amount of capital required in the production of goods and services. The higher the proportion of labor costs, the more labor intensive the business. Data concerning labor intensity are not available in the Indonesian Economic Census, BPS Statistics Indonesia or the World Bank and OECD data bases. In order to investigate the labor intensity which may suggest a shift to a next stage of development, it is also possible to measure its inverse, capital intensity.

The OECD measures capital intensity as the investment share of the GDP (Conway et al. 2010). According to OECD data, Indonesia's investment rate (Gross fixed capital formation) was 4.1% in 2014, which is well above the OECD average of 2.8%. However, it is not possible to separate the service contribution from this investment rate, or to differentiate by region. The World Bank INDO-DAPOER dataset contains information about capital expenditure per region, starting from 2001. This information is not particularly precise and does not have the same time span as the two census, but might give an indication of capital intensity when compared to the regional GDP (and regional labor force?)¹

Here we compare capital expenditure per region with the national capital expenditure. We assume that the higher the percentage, the lower the labor intensity. The locations of the higher rates are then compared to the service core, to see if low labor intensity is clustered at the same locations as the knowledge intensive business services. And to answer the question if there is a noticeable decrease in labor intensity which would implicate the substitution to knowledge intense activities.

¹ Related World Bank INDO-DAPOER Data on GDP expenditure on gross fixed capital formation (in IDR million), Total Credit by Utilization: Working Capital (province level in IDR million) and Total credit by Utilization: Investment (province level, in IDR million) are not complete enough for usage.

Chapter 4 | National level analysis

Economic development is a complex and multifaceted phenomenon. There is no such thing as one way to approach it. Reason enough to focus on a range of dimensions of Indonesia’s developmental path. This helps to find an explanation for recent service sector growth in Indonesia, in either a positive scenario of deindustrialization or in a negative scenario of marginality. This chapter includes an analysis of national level data on the importance of the service sector, the level of international connectedness and the role of human capital.

In the first part of this national level analysis the structure and relevance of Indonesia’s service sector is economically assessed from different angles, which will give more insight in what is taking place, and the scale of it. After that, foreign direct investment is analysed. From the previously discussed theory it has become clear that knowledge intense economies are active players in the world economy that benefit from globalization. An economy that is moving towards that type of economy would experience an increasing level of international connectedness. This can be measured by looking at international trade or the amount of treaties concluded, but the most accurate indicator of international connectedness is foreign direct investment (FDI). Furthermore, in a knowledge based economy one thing is of great importance: human capital. This third dimension will be approached by looking at employment data. If there is a shift of economy type, one would expect relatively more knowledge workers in the service sector. And to be more precise, in the knowledge intense (business) services.

The service sector

One way to measure economic growth, is to look at the yearly growth of gross domestic product (GDP). This is an accumulation of the added values of all economic sectors. Part of this rate is the growth in added value generated by the (wide variety) service sector.² These two are combined in figure 1, allowing us to compare the service sector growth with the average growth of all Indonesian sectors.

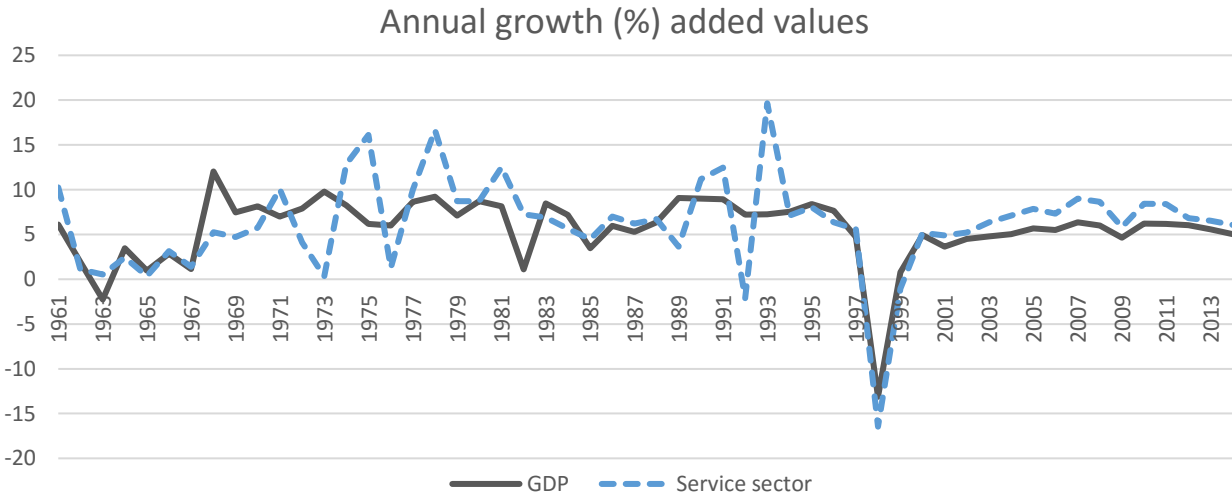


Figure 1. Source: World Bank, World Development Indicators, 2015.

² In this analysis ‘services’ contain ISIC rev. 3 sectors 50-99, beside knowledge intensive business services including wholesale and retail trade, hotels and restaurants, transport, storage and communications, government and defence functions, education, health and social work, and other services.

It becomes clear that since 2000 the Indonesian GDP has been growing in a steady pace, with an average of around 5.3 percent a year. Over the same time, the service sector growth rate has constantly been higher: it was on average 6.9 percent. This is a remarkable difference, but as the economy as a whole is growing, these growth numbers are not enough to conclude that the economic structure is changing, nor that the service sector plays an extraordinary role in the economy.

The significance of service sector growth can better be examined based on the sectoral share of (wide variety) services in Indonesia’s economy. This is represented as added value - the net output of a sector after adding up all outputs and subtracting intermediate inputs, calculated as a percentage of the GDP. The data in figure 2 show that in over fifty years, the services have gained some importance in the Indonesian economy. There were some highs and lows, although not excessive.



Figure 2. Source: World Bank, World Development Indicators, 2015.

Interestingly, the country’s history becomes visible through these data. From a dip in the last years of the authoritarian regime (1963-1965), followed by a more or less stable level of around 36 percent, to the years of development and the start of industrial output in the 1980s and early 1990s. A new dip in 1998 marked the Asian economic crisis, followed by recovery and another dip in 2008/2009 that might be related to the global financial crisis. Since then the sectoral share has been increasing, to a new high of 43.32% in 2014.

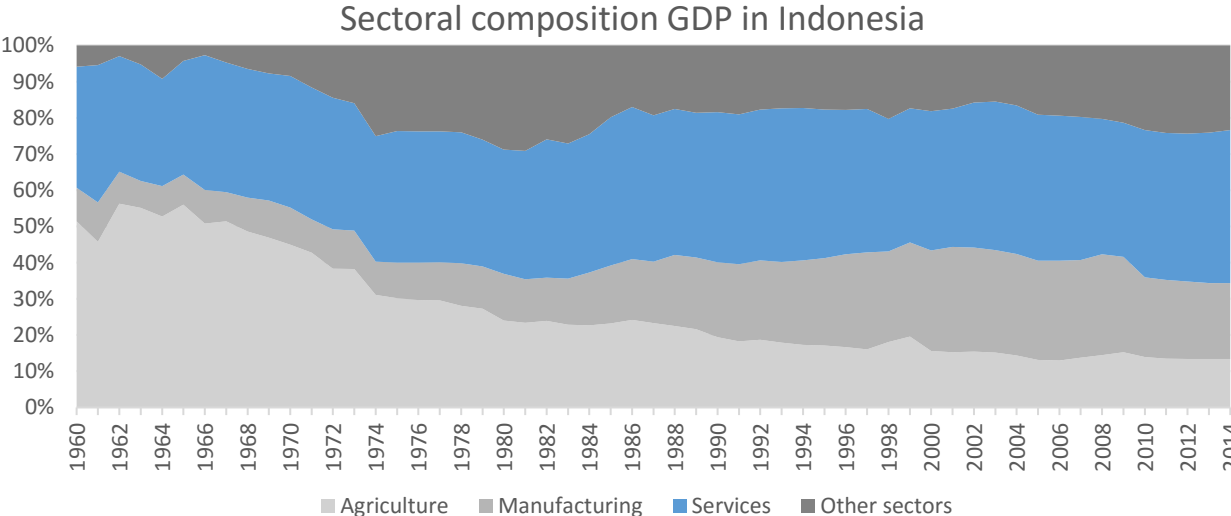


Figure 3. Source: World Bank, calculated from World Development Indicators, 2015.

To see the context of this information, it is important to compare the service sector to the agricultural, manufacturing and other sectors (including fishing, mining, construction and electricity, gas and water supply). This is shown in figure 3. It is clear that the share of agriculture has fallen over the years, from over half of the GDP in the early 1960s to around 13 percent today. Manufacturing started to bloom in the 1980s and has lost ground in recent years. However, with a sectoral share of around 21 percent manufacturing stays an important sector in the Indonesian economy. An important notion here is that the informal sector is not shown in this figure.

In figure 4 we compare Indonesia to other developing countries, more specifically the BRIC and other MINT countries. We find that Indonesia’s service sector is on a more constant level than that of the other countries (except for Mexico). A steep or otherwise substantial growth seems to be missing. As a result, the most recent data point out that Indonesia lags behind in terms of share of the service sector in the overall economy. That means that in the other MINT and BRIC countries, the (wide variety) service sector counts for a higher proportion of the GDP.

Sectoral shares services in BRIC and MINT countries

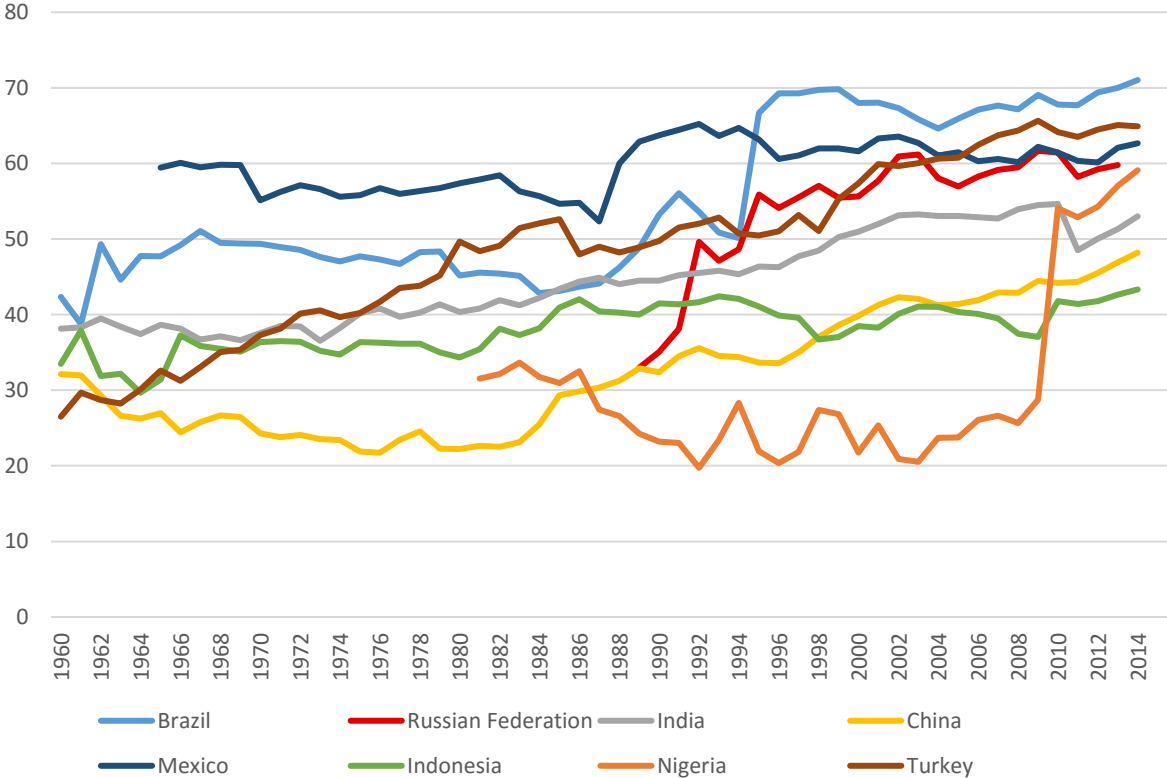


Figure 4. Source: World Bank, World Development Indicators, 2015.

A possible explanation for the lower position of Indonesia might have to do with geography: the abundant natural resources, people spread over so many islands, and different indigenous cultures. The expectation is that if only Java and Bali were taken into consideration, the contribution of services would be remarkably larger.

International connectedness - FDI

The foreign direct investment (FDI) describes cross-border investment of equity, which is connected to a significant degree of influence by the investor on the management of the receiving enterprise. Investment in foreign companies is designated as FDI if the investing party has ownership of 10 percent or more of the ordinary shares of voting stock.

The data for Indonesia are available from 1981 on. In that first year, there was a modest net FDI of 133 million American dollars. This grew to a top of 6.2 billion in 1996. After then the influence of the Asian economic crisis became clearly visible, by the downfall of FDI to a point where the net direct investment by Indonesians in the rest of the world exceed that by foreigners in Indonesia with 4.6 billion in 2000. The impact of the global economic crisis on Indonesia is not that big, especially not compared to neighbouring countries Singapore and Malaysia. The logical explanation is that Indonesia is a larger economy, less dependent on external demand (and more on internal demand).

From that year on, the data show a strong increase in FDI inflows, although with some ups and downs. In 2014 the net inflows were 26.35 billion dollars.



Figure 5. Source: World Bank, World Development Indicators.

Compared to the other MINT and BRIC countries, Indonesia’s FDI inflows are far less than that of China (989.1 billion) and Brazil (96.9 billion), but in the same range as Russia, India, and Mexico. Nigeria (4.7 billion) and Turkey (12.8 billion) lag behind.

The Indonesian Investment Coordinating Board (BKPM) provides more detailed information about FDI in its 2016 report on domestic and foreign direct investment realization. However, this is presented in a series of rather misleading pie charts, because colours are not assigned per sector, but based on the order of shares. When the FDI trend data are transferred to a tabulation (Table 1), one can deduce that over the last years, the percentage of FDI on (wide variety) services has dropped dramatically and is rising again. Almost its inverse is manufacturing, with rates that have risen enormously, but seem to be past its highest point.

The magnitude of these changes suggest a larger power shift. It could be that after the global financial crisis, where the service sector was hit hard, investors put their trust in the more tangible manufacturing sector. But as this seems to be on its return, it is difficult to interpret these data and to predict the consequences of this sudden shift.

	Services	Manufacturing	Mining	Food Crops and Plantation	Forestry, Livestock and Fishery
2010	60.7	20.6	13.6	4.6	0.5
2011	40.0	34.8	18.6	6.3	0.3
2012	28.0	47.9	17.3	6.5	0.3
2013	22.0	55.4	16.8	5.6	0.2
2014	29.9	45.6	16.4	7.7	0.4
2015	38.5	40.2	13.7	7.0	0.6

Table 1. FDI sectoral percentages. Source: BKPM 2016.

The geographical destination of FDI is presented in table 2. Here we see that the dominance of the Jakarta area decreases. Although West Java received a high rate of 19.6 percent of national FDI inflows in 2015, the overall pre-eminence of these four Javanese regions is declining. In 2015 over fifty percent of FDI was destined for other regions. Interestingly, in the regional analysis of chapter 5, we will find a similar outcome on clustering of business intensive services.

	Jakarta	East Java	West Java	Banten (Java)	Others
2010	39.7	10.9	10.4	9.5	29.5
2011	24.8	6.7	19.7	11.2	37.2
2012	16.7	9.4	17.1	11.1	45.7
2013	9.1	11.9	24.9	13.0	41.1
2014	15.8	6.3	23.0	7.1	47.8
2015	12.4	8.9	19.6	8.7	50.4

Table 2. FDI percentages by location. Source: BKPM 2016.

Figure 6 illustrates that Java is still by far the largest recipient of FDI investment. But it also shows the presence of the archipelago’s largest islands Kalimantan (1st), Sumatra (2nd) and Sulawesi (3rd), ranking the same in terms of FDI inflows.

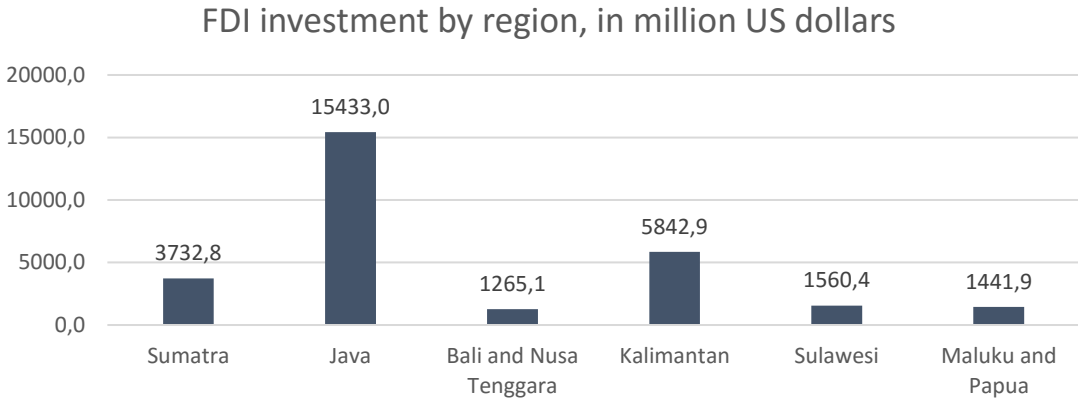


Figure 6. Source: calculated from BKPM 2016.

Education

This first education graph (figure 7) shows the employment of higher educated people in the service sector. To give an overview of the labor market in this field, a wide definition of service industries is being used. All given service categories are included, so this graph captures both activities that require a high level of knowledge and those for which this is not required. Note that data for 2005 are missing.

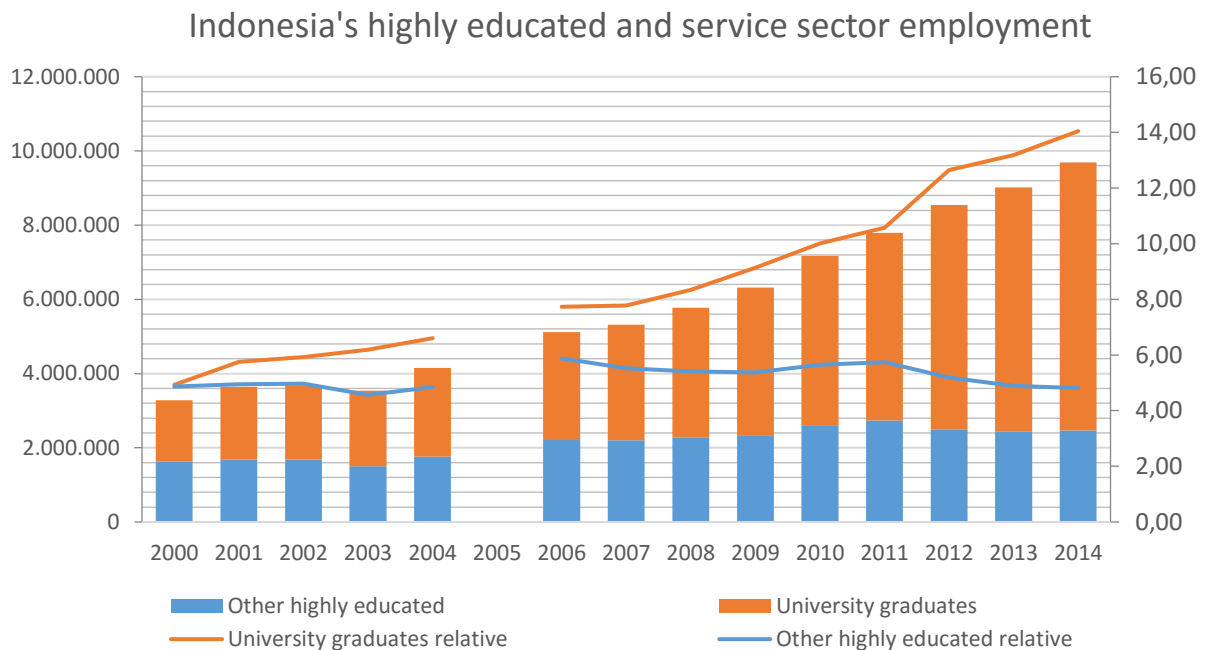


Figure 7. Service sector employment and educational attainment. Source: BPS Statistics.

From the BPS statistics data it becomes clear that the service sector grew from over 33 million workers in 2000 to over 51 million in 2014. The workers who benefit the most from that development, are the university graduates. In this strongly developing sector their share rose from less than 5 percent in 2000 to little over 14 percent in 2014, to a number of 7.2 million workers. This is a significant increase, suggesting a positive explanation of deindustrialization on the labor market. Meanwhile, the other higher educated have increased in number but keep a more or less constant share of 5.2 percent. Because of this difference, and because of the heterogeneity amongst the other highly educated, we focus on the university graduates.

The increase of knowledge workers in the service sector looks promising. But the wide variety service data do not tell about the quality nor relevance of service activities (for the transition). In order to be able to draw conclusions, it is essential to know where the university graduates are located in the service sector. More specifically: whether they are employed in knowledge intense (business) services.

The data divide all service workers over four subsectors, shown in figure 8. In 2014, over 5 million university graduates were employed in the Community, Social and Personal Services. This is an enormously large sector that is most likely to correspond to ISIC Rev. 3 categories L-Q;

Public administration and defense, compulsory social security; Education; Health and social work; Other community, social and personal service activities; Private households with employed persons; Extra-territorial organizations and bodies.

As expected, the financing, insurance, real estate and business services count for the largest density of university graduates. This sector is much smaller: the number of university graduates in 2014 was 914.685.

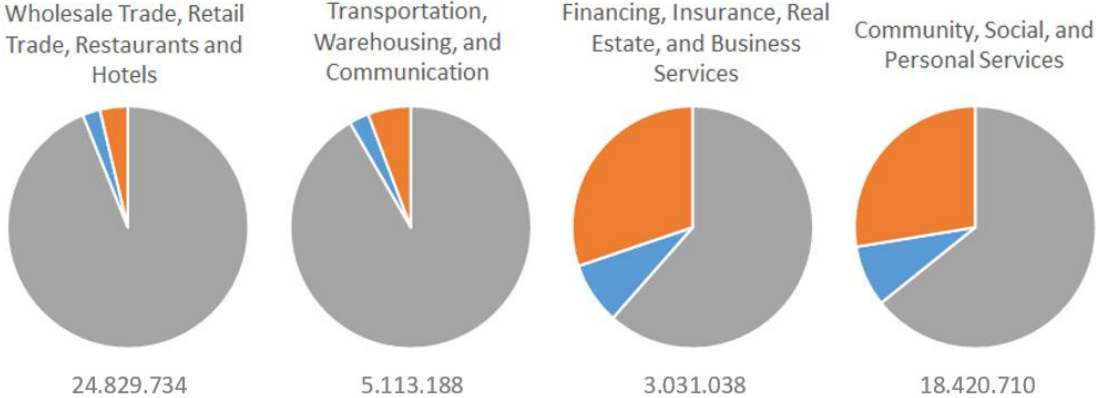


Figure 8. University graduates (orange) and other highly educated (blue) in service subsectors. Source: Calculated from BPS Statistics employment data.

Zooming in on the financing, insurance, real estate and business services (figure 9) it becomes clear that the amount of employees in this subsector has tripled since 2000. The share of university graduates has fluctuated, but has always been relatively high. In recent years, around thirty percent of employees possess a university degree.

Figure 8 also shows that by focusing on the knowledge intensive business services, we exclude many knowledge intense service activities. These overlooked activities are very important to society: to a great extent they establish the political, economic and social infrastructure. And they employ a large number of university graduates. It becomes clear that the community, social and personal services category has almost doubled in number since 2000. And the percentage of university graduates in this sector has risen every year, from below 12,5 percent in 2000 to over 27 percent in 2014. This means an increase of university trained government professionals of almost 4 million, which exceeds the total number of employees in the knowledge-intensive business services.

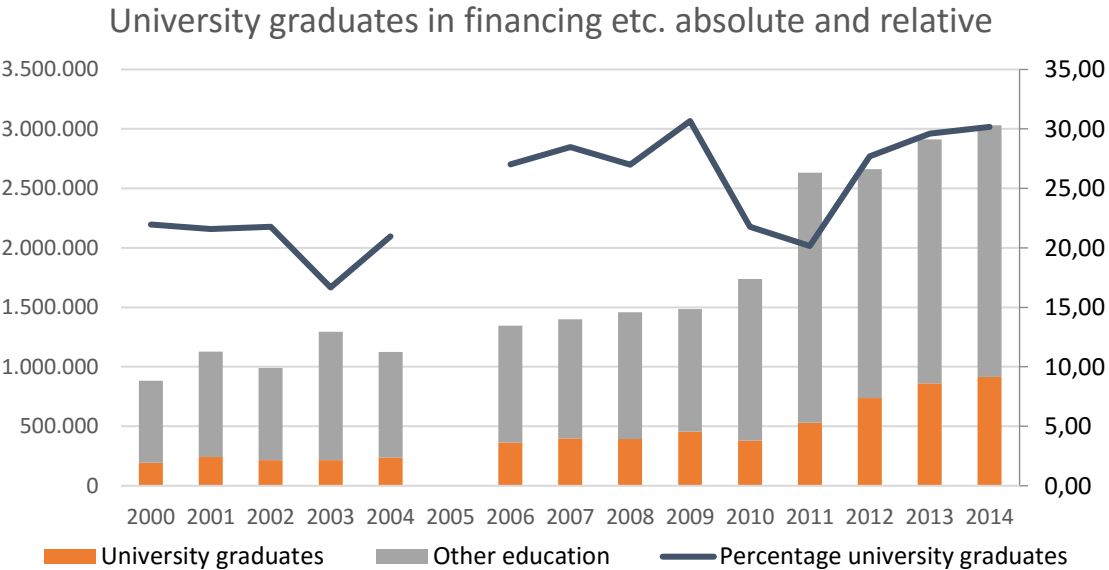


Figure 9. Source: calculated from BPS Statistics employment data.

In conclusion

This chapter concerns the national level analysis of three aspects of deindustrialization: service sector characteristics, participation in the global economy and education.

The first analysis showed that over the years the economy structure has changed, by declining shares of agriculture and, more recently, manufacturing. Still the role of service industries is not convincing. Although the added value of the wide variety services grows faster than the GDP, the sectoral share of services only has a slow average growth. In terms of level and speed, the service sector growth in Indonesia does not keep up with its peers (i.e. the other MINT and BRIC countries). However, growth does not lag behind too far either, so while the deindustrialization hypothesis cannot be accepted, the contrary, marginality, is not a valid alternative explanation for this aspect.

The second aspect, international connectedness, is measured by means of FDI net inflows. These have risen explosively since 2009. The data on FDI show in a very general way the growing international connectedness of the Indonesian economy. The scale of this all is in line with what is expected from developing countries. Looking at the sectoral destinations, there have been major fluctuations in the balance between services and manufacturing as destination for FDI. Foreign direct investment continues to flow to Indonesia, but it is for the time being impossible to discern a clear pattern. In terms of physical destinations, the overall pre-eminence of the four Javanese regions is declining. This is in line with the recent decentralization policy.

Analyzing the third aspect, education, the results show that there has been a strong increase of university trained people in the service sector. The highest relative number of university graduates is to be found in Financing etc. (that relates to the knowledge intensive business services). Remarkably, this subsector has experienced a massive growth: from less than a million to three million employees since 2000. This indicates that overall there is greater emphasis on knowledge on the labor market, suggesting a shift towards a more knowledge based economy. However, this growing importance of human capital can be strongly local. That is why the same phenomenon will be studied on a regional level in the next chapter, this time by measuring regional level labor intensity.

In absolute numbers the government employs the most university graduates. This subsector has also grown a lot, which was to be expected from a developing country. It is well known that government service improvement often precedes economic development. The reason is that basic needs must be met and firms need the government to create a certain infrastructure (of education, business and property laws) that enables entrepreneurship. The phenomenon of government service growth in connection to economic development is definitely interesting, but nevertheless beyond the scope of this thesis.

Chapter 5 | Regional level analysis

How does the growth of the service sector in Indonesia relate to positive explanations of a shift of economy type, and negative explanations of marginality? After discovering signs of both explanations in the analysis of national level indicators, in this chapter we will examine regional level indicators of moving to a knowledge based economy. These include clustering, growth of knowledge intensive business services, social spillover effects, labor intensity and infrastructure expenditures.

The starting point is the degree of clustering of knowledge intensive business services in both 1996 and 2006. Subsequently we want to know what factors determine these clustered areas. To what extent can they be associated with growth of knowledge intensive business services and other developmental indicators? After that, we want to know what factors accompany knowledge intensive business service activity growth.

Argument and expectations

It is often assumed that knowledge intensive firms and activities have strong propensity to concentrate in geographical space, which can be explained by the theory of agglomeration economies (Marshall, 1890; Todtling et al., 2006). This is especially so in the early stages of industry development, when according to the cluster life cycle hypothesis (Swann, 1998) proximity is vital. When an industry matures, economic activities will become more geographically dispersed. Since the knowledge intensive business services are a developing sector, we would expect to see an evident pattern of clustering.

Knowledge intensive business services are often perceived to be functioning as facilitator, carrier or source of innovation. Strong growth in these activities reflects changing social conditions and technologies, and a need for specialist, knowledge intensive input to help firms with improving their business strategies and processes (Miles, 2005). And, as we are particularly interested in a shift of economy type that has a big impact on society, we test the effects of knowledge intensive business service clustering and growth on overall regional growth of the number of non-KIBS firms.

We want to know what economic spheres typically accompany the clustered areas. And what other economic activities might explain the need for knowledge intensive services. Specifically, to what extent the knowledge intensive clusters show signs of urbanization economies, that are associated with long-term, stable growth (Jacobs, 1984). That is the reason to include control variables on regional shares (E_{ir}/E_r) of other sector rates (i.e. manufacturing, oil and gas) and unrelated variety and related variety (for the number of establishments). The presence of urbanization economies would suggest an change in the regional economy.

The next series of control variables are labour market factors: the level of self-employment, the level of unemployment, and the percentage of higher educated people. Knowledge intensity and urbanization should be connected to both higher levels of self-employment and higher levels of university graduates. Unemployment should drop, because in the cluster people are matched to their jobs. At the same time, we know that urbanization is a threatening force too. Clusters can be harsh environments in which necessity based entrepreneurship and unemployment rise. An explanation could be found by connecting the dots of the overall analysis outcomes, but we have to be careful in doing so.

Another labour market factor that will be analysed in this chapter, however not as a control variable, is labour intensity. The question is if there is a noticeable decrease in labour intensity which would implicate the substitution to knowledge intense activities. Other control variables are factors that point to the ideas of urbanization effects and the efficiency that is associated with clustering: population density and average firm sizes. Both are expected to reach higher levels inside of the cluster.

The regional shares of infrastructure expenditure is included in the overall analysis, because this shines a light on the governmental role to encourage knowledge intensive clusters. If the government acknowledges and stimulates the clustering of knowledge intensive business services, we would expect to see matching effort to increase physical connectedness. We know that there is an overall need for improvement of infrastructure in Indonesia, but still we would expect to see that the clusters are prioritized, for these are supposed to be the areas of potential growth.

Regional distribution

Clustering of knowledge intensive business services

Using the 1996 and 2006 Economic Census data, the regional distribution of knowledge intensive service industries can be illustrated. Two important adaptations were made in the data. The regions were recoded to correspond, and as these datasets provide information at a firm level, the data were aggregated on a regional level. To measure clustering, a location quotient was calculated for both 1996 and 2006. Based on the location quotient, we can define core, intermediate and peripheral areas. Most likely core areas will have a location quotient of at least 1.2, intermediate will be between 0.8-1.2, and peripheral areas will have a location quotient of 0.8 and less (this is a common way of presenting LQ results, see for instance StatsAmerica, 2015).

Looking at the cartographic results in figure 10, the most apparent thing is that the 1996 map has more dark red areas than the 2006 map, indicating that there are more clustered knowledge intense areas in 1996. This is true: in 1996 there were 101 in the highest category, versus 88 in 2006. In the medium category the difference is even larger: 108 versus 84. This can be explained by the fact that in 1996, the national share of knowledge intense business services was much lower than ten years later. In 2006 knowledge intense business services were more common. That created a higher threshold for regions in getting a high LQ rate. This results in more differentiation, which is visible in the data by a higher range and standard deviation. Because of this higher threshold, arbitrariness is reduced and the results reflect more reliable explanations.

Another interesting result is that the locations of high LQ levels differ between both years. However, clear patterns are visible on the south-west coast of Sumatera (1701, 1703), in central Sumatera (1303, 1304, 1504), and on the small islands north of Sumatera and Kalimantan (2102). On Kalimantan a high LQ region in both datasets is the province capital Palangkaraya (6271).

The Javanese coastal cities of Semarang, Kendal, Rembang and Surabaya (3324, 3374, 3317, 3578) have high clustering rates. This corresponds with the idea that port cities have a long history of commercial activities, and that this vivid local economy is advantageous for knowledge intensive services. Less visible is that Sulawesi's coastal cities of Kendari, Manado, Parepare, Gorontalo and Palu do have high LQ rates. The same holds true for Ambon (Maluku) and Jayapura (Papua).

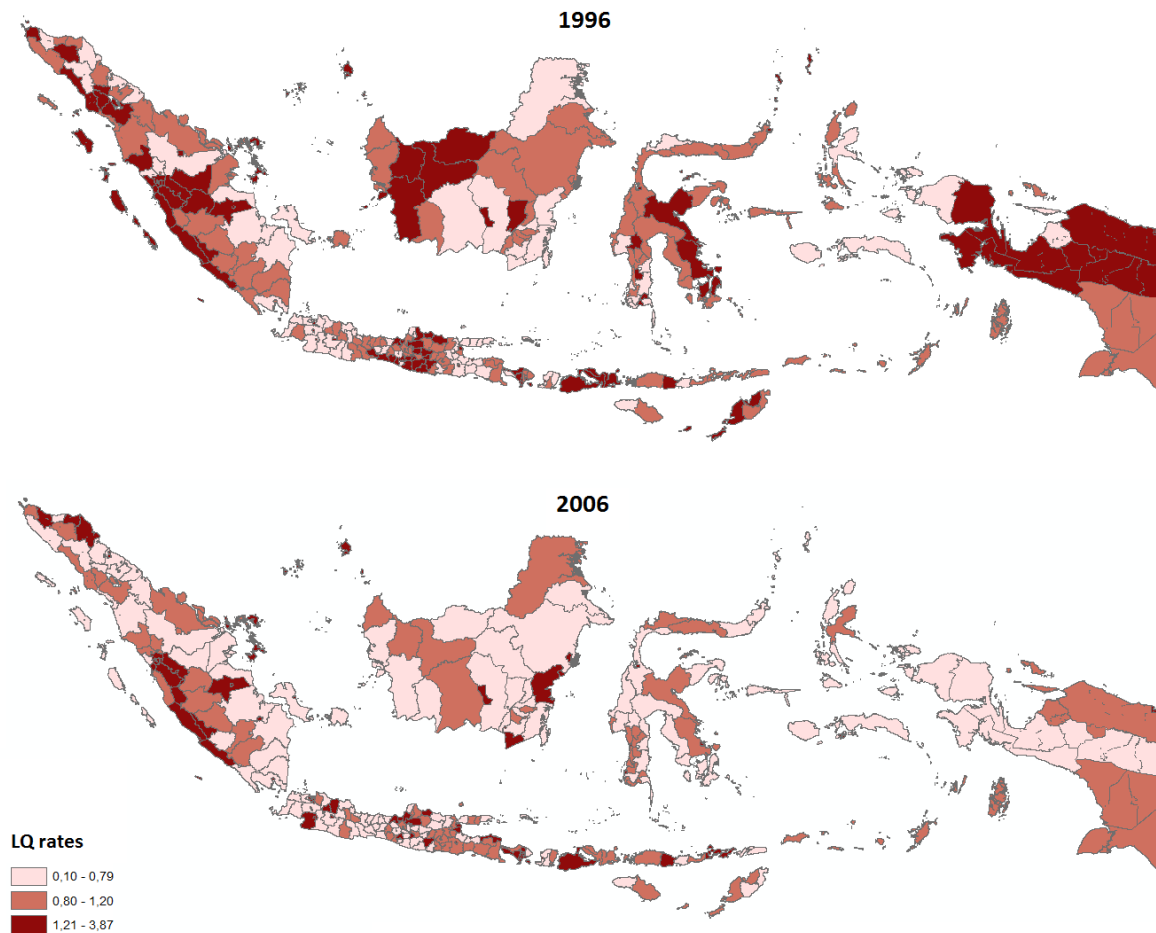


Figure 10. Clustering of KIBS in 1996 and 2006.

Indonesia's capital Jakarta is present in both high LQ lists, but only in the 2006 with all of its regions. In Central Java the clustered areas are in the city of Yogyakarta (3404) and its neighbouring region Sukoharjo (3311). On Bali there are several regions with clustered knowledge intensive business services.

Many locations of high clustering are bigger, coastal cities, where one would expect a strong regional function of knowledge intensive business services. However, the reason behind clustering is less apparent for Ponorogo (3502) in East Java, the island of Sumbawa, and the middle part of Flores. The size and location of Ponorogo do not explain the high score, and for Flores it is strange that the high clustering is not in the region of its capital Maumere. The high clustering on Sumbawa could be explained by the fact that the regency, due to years of large scale mining activity, is relatively rich in terms of gross regional domestic product per capita. This could enhance consumer driven knowledge intensive service growth. Or because there is a higher standard of living, more use of schooling, more knowledge intensity, more advanced business services.

Overall, this LQ analysis shows that high knowledge intensive business services do not only take place in the most developed islands of Java and Bali. Instead, clustering is far more dispersed than previously expected. If clustering of knowledge intensive business services is indeed connected to development, it does not explain current levels of development. But it could show which areas are developing, and the regional structure of that development. Then the question is, what factors determine these clusters? To what extent can they be related to growth and other (developmental) indicators?

Knowledge intensive business firm growth

Growth of knowledge intensive business activity is measured as the annual growth rate between 1996 and 2006. In a quantile map, we see that relative growth is divided over the island quite evenly: high percentages of growth are to be found on most islands. The difference with absolute growth is remarkable: measuring growth as an absolute number, the highest growth numbers are to be found on Java, especially in the Western and Eastern urban areas. Other places of major growth are on Sumatera, in the North and South and around Pekanbaru, and on Kalimantan in the Tanah Laut regency. Other fairly high growth areas are on Southern Bali and Eastern Lombok.

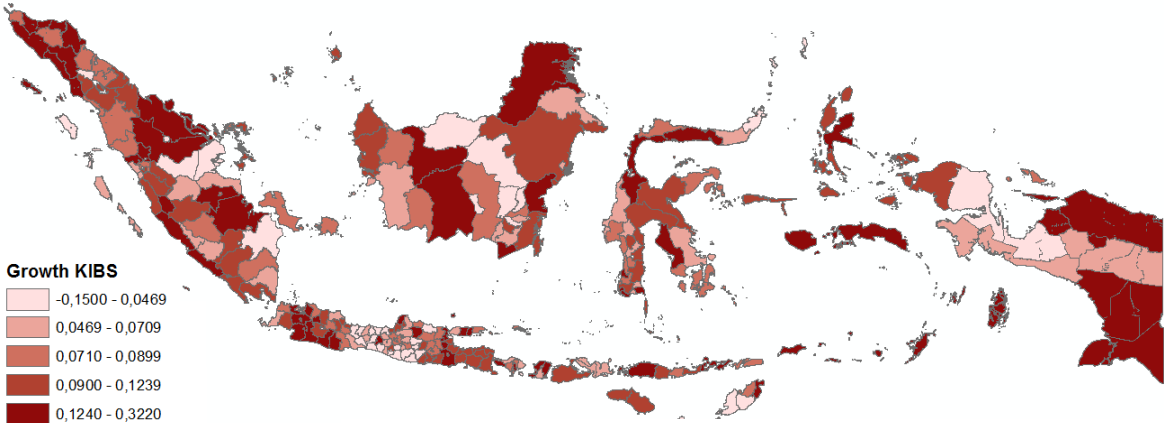


Figure 11. Annual growth rate of the number of KIBS 1996-2006.

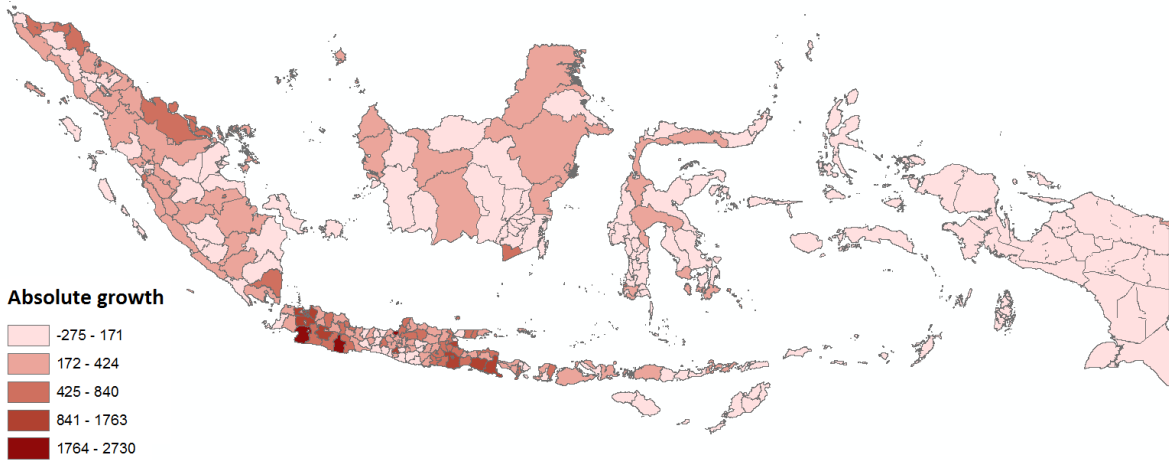


Figure 12. Absolute growth of the number of KIBS 1996-2006.

The reason for this is the large differentiation in the number of knowledge intensive business services in 1996. In many high scoring regions there were less than 100 of these firms. In that sense growth is somewhat exaggerated. As the annual growth rate captures growth very well, we choose this calculation over the absolute numbers of growth. In figure 13 a quantile map of the non-KIBS growth is shown. Again this is measured as the annual growth rate between 1996 and 2006. It is clear that overall the number of firms has grown.

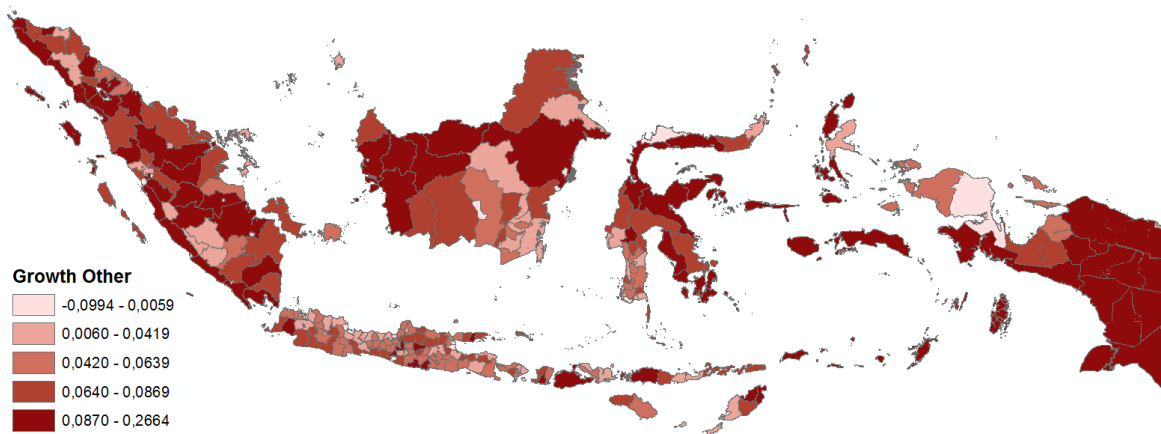


Figure 13. Annual growth rate of the number of non-KIBS firms 1996-2006.

Infrastructure

Government expenditure on infrastructure could show policy priorities on the regional development. A government that recognizes clustering of knowledge intensive firms and knows about their potential for economic development and growth, would want to invest in the connectivity of these regions. In figure 14 we see high expenditure levels in the Jakarta region, and in regions that have important natural resources.

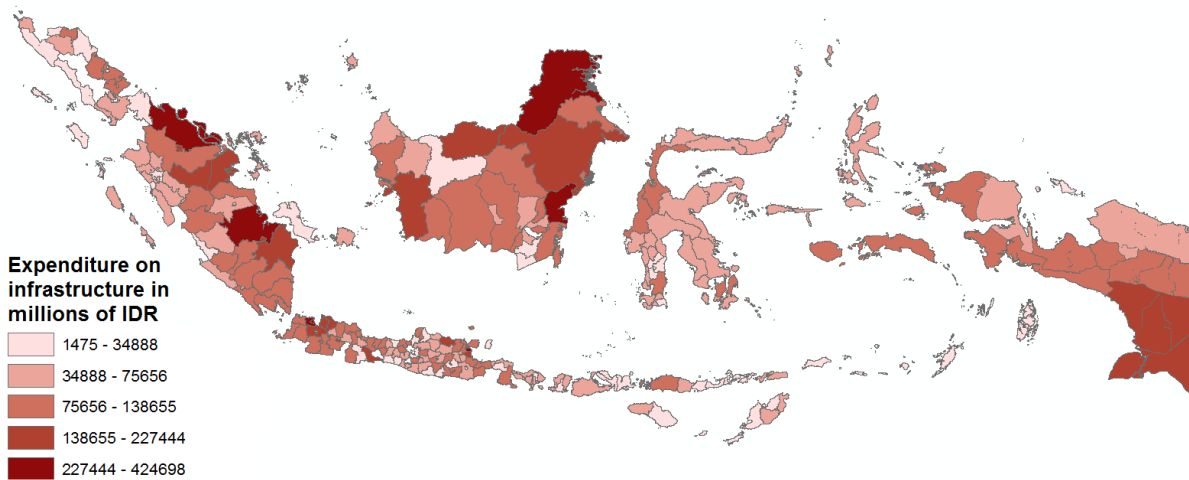


Figure 14. Infrastructure expenditure in 2006, in millions of IDR.

Labour intensity

Capital investment shares were included as the inverse of labour intensity. We assumed that one characteristic of more advanced, knowledge intensive business service climate would be lower labour intensity. On a region level we could derive this from higher levels of capital expenditure. Figure 15 shows that high levels of capital investment are not to be found in Java, Bali, Lombok, Flores, the South-West coast of Sumatera, and the KIBS clustered regions of Kalimantan (except for Paser). Instead, capital investment is clearly concentrated on the North-East coast of Sumatera, on Kalimantan and Papua, i.e. in regions where natural resources are exploited. By way of comparison, a map for the oil and gas activity dummy variable, with a remarkably similar pattern, is shown in figure 16.

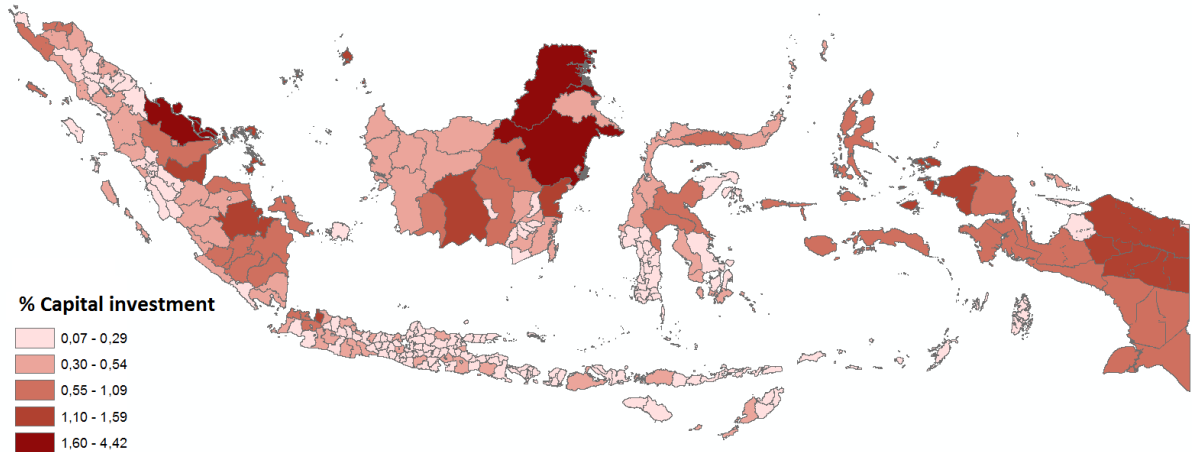


Figure 15. Capital investment in 2006.

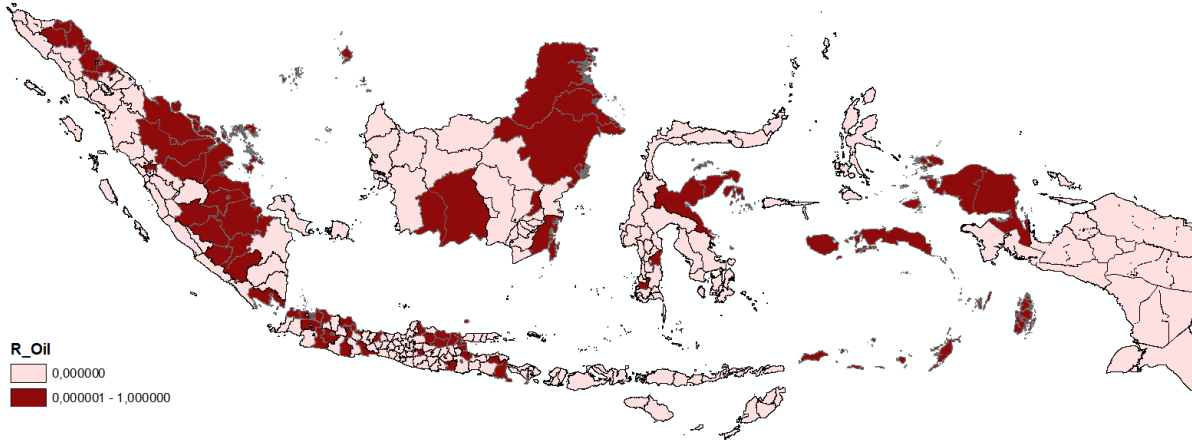


Figure 16. Regions that host oil and gas production firms.

Correlations

For more insight into how pairs of variables are associated, a Pearson correlation test is performed. The result in figure 17 shows (with adjusted variable names for reasons of clarity) that most of the correlations are between -0.5 and 0.5, which indicates that the variables are not significantly influenced by each other.

Exceptions are to be found for the combinations of higher educated shares with respectively clustering in 2006 (0.589); growth of non-KIBS (-0.639); unemployment (0.520); and related variety (0.506). Especially the first variables are inherently connected. Knowledge intensive business services are to a large extent dependent on higher educated workers. The outcomes suggest some degree of specialization, because of the positive correlation of higher educated with related variety and the negative correlation with non-KIBS growth. In line with this is the negative correlation of non-KIBS firms with clustering of KIBS in 2006 (-0.525); and furthermore with unemployment (-0.508); and related variety (-0.532). Another combination that has a high score on correlation is unemployment with related variety (0.511).

Because all listed control variables are important for the narrative, they are included, but extra tests on multicollinearity will be needed. However, the combination of the variables growth of other, non-KIBS firms and the share of higher educated workers will be avoided.

		LQ_06	LQ_96	GR KIBS	GR OTH	UNE	SE	HE	MAN	OIL	UNRELV	RELV
LQ_06	Pearson Corr.	1	.284	.175	-.525	.298	.210	.589	-.312	.016	.306	.453
	Sig. (2-tailed)		.000	.003	.000	.000	.000	.000	.000	.780	.000	.000
LQ_96	Pearson Corr.	.284	1	-.459	.133	-.117	-.043	.197	-.109	-.143	.045	.044
	Sig. (2-tailed)	.000		.000	.024	.046	.463	.001	.064	.015	.442	.460
GR KIBS	Pearson Corr.	.175	-.459	1	.333	-.102	-.047	-.243	.075	.023	.064	-.084
	Sig. (2-tailed)	.003	.000		.000	.082	.429	.000	.202	.692	.280	.155
GR OTH	Pearson Corr.	-.525	.133	.333	1	-.508	-.288	-.639	.219	-.135	-.280	-.532
	Sig. (2-tailed)	.000	.024	.000		.000	.000	.000	.000	.021	.000	.000
UNE	Pearson Corr.	.298	-.117	-.102	-.508	1	.314	.520	-.284	.209	.120	.511
	Sig. (2-tailed)	.000	.046	.082	.000		.000	.000	.000	.000	.042	.000
SE	Pearson Corr.	.210	-.043	-.047	-.288	.314	1	.193	-.063	-.025	.177	.220
	Sig. (2-tailed)	.000	.463	.429	.000	.000		.001	.287	.670	.003	.000
HE	Pearson Corr.	.589	.197	-.243	-.639	.520	.193	1	-.356	.114	.238	.506
	Sig. (2-tailed)	.000	.001	.000	.000	.000	.001		.000	.053	.000	.000
MAN	Pearson Corr.	-.312	-.109	.075	.219	-.284	-.063	-.356	1	-.251	.216	-.301
	Sig. (2-tailed)	.000	.064	.202	.000	.000	.287	.000		.000	.000	.000
OIL	Pearson Corr.	.016	-.143	.023	-.135	.209	-.025	.114	-.251	1	-.076	.198
	Sig. (2-tailed)	.780	.015	.692	.021	.000	.670	.053	.000		.197	.001
UNRELV	Pearson Corr.	.306	.045	.064	-.280	.120	.177	.238	.216	-.076	1	.429
	Sig. (2-tailed)	.000	.442	.280	.000	.042	.003	.000	.000	.197		.000
RELV	Pearson Corr.	.453	.044	-.084	-.532	.511	.220	.506	-.301	.198	.429	1
	Sig. (2-tailed)	.000	.460	.155	.000	.000	.000	.000	.000	.000	.000	

Table 3. Correlation outcomes for used variables.

Labour intensity

This section is based on the assumption that quality services have low labour intensity rates. The available data that were closest to that, address capital investment. Because capital intensity can be seen as labour intensity’s inverse, we assumed that high percentages of regional capital expenditure go hand in hand with low regional labour intensity. Again no causal relationship can be proven. Instead of regression we perform a correlation test, the results are shown in table 4.

		% Capital investment	LQ_06
% Capital investment	Pearson Correlation	1	-.196
	Sig. (2-tailed)		.001
LQ_06	Pearson Correlation	-.196	1
	Sig. (2-tailed)	.001	

Table 4 . Correlation table for capital investment and 2006 clustering.

High levels of capital investment are not to be found in Java, Bali, Lombok, Flores, the South-West coast of Sumatera, and the high LQ regions of Kalimantan (except for Paser). Instead, capital investment is clearly concentrated on the North-East coast of Sumatera, on Kalimantan and Papua.

A negative correlation becomes visible: as clustering increases, the rate of capital investment decreases. We expected capital intensity and low labour intensity to happen in roughly the same areas as the knowledge intensive business service core areas. High levels of capital investment would point to development, streamlining of industries, and a transition to lower levels of labour intensity. However, it is the other way around: capital investment is located mostly in regions that have relatively few knowledge intense business services.

Infrastructure

The infrastructure expenditures were intended as explanatory variable for the regression. But because of the many missing values, these data were not suitable for this analysis. However, the relation between clustering of knowledge intensive business services and infrastructure expenditure is still interesting. It indicates to what extent the government tries to accommodate for service sector growth, for the importance of face-to-face contact and the increasing labour mobility. If the government acknowledges and stimulates the clustering of knowledge intensive business services, we would expect to see matching effort to increase physical connectedness.

When the dataset is adapted to infrastructure data availability, it appears from the correlation results (in table 5) that there is a significant correlation between clustering of knowledge intense business services and infrastructure. But, surprisingly, the relationship is negative: it decreases with increasing clustering of knowledge intense business services.

		Infrastructure expenditure	LQ_06
Infrastructure expenditure	Pearson Correlation	1	-.160
	Sig. (2-tailed)		.010
LQ_06	Pearson Correlation	-.160	1
	Sig. (2-tailed)	.010	

Table 5. Correlation table for infrastructure expenditure and 2006 clustering.

As became clear by the regional distribution in figures 14 and 15, the regions that receive high sums of capital investment and infrastructure expenditure, are the regions that are important locations for natural resources exploitation. In those remote areas the labour costs are likely to be lower than in high LQ areas, which reveals even more that the government prioritizes these areas in their infrastructure development plans.

Associations

Knowledge intensive firms and activities tend to concentrate in geographical space, especially in the early stages of industry development when proximity is vital (Todtling et al., 2006). The location quotients were calculated to test this for the knowledge intensive business services in Indonesia. As there is an evident pattern of clustering, we want to see what characterizes these clusters in terms of association with growth and other developmental indicators. After that, we focus on knowledge intensive business service activity growth and the accompanying factors.

Outliers and problems

In the first phase of the data analysis, the dataset is checked on outliers and problems. A few correlation or collinearity concerns arise, especially for the combination of higher educated shares and growth in the number of non-KIBS firms, which gives an extraordinary correlation. To avoid problems, only one of the two is included per analysis. Furthermore, it appeared that the variable for population density caused correlation or collinearity problems. This variable is therefore excluded. The same applies to the firm sizes variable, that gave errors with regions outside of Java, resulting in a less precise variable (that gave correlation problems too).

In order to look at the economic surroundings of KIBS clustering and growth, the regional shares of the manufacturing industry and oil and gas production are included. There are only a few firms that produce oil and gas. In order to use this variable in a more meaningful way (with some explanatory power) a dummy was created, where regions that have one or more oil and gas firm were assigned the value '1' whereas the other regions were assigned value '0'.

The regression model

For both the cluster and growth analysis, first a linear regression is performed. Because in both cases there is a significant result on the robust LM test for spatial error, next a spatial error model is used. This slightly improves the model fit and results on significance.

A linear regression model (ordinary least squares) assumes that the dependent variable is continuous, and requires the residuals to be normally distributed. The first assumption is met, both the LQ and growth variables are measured on an interval scale, and all values are possible. The residuals are normally distributed as well. To correct for spatial autocorrelations between neighbouring regions, a spatial weights matrix is added to the regression model. The chosen system is that of queen contiguity, that recognizes regions as neighbours when they share either boundaries or corners.

The creation of spatial weights

In the first version of the spatial weights matrix there were nine regions without neighbours, all islands. These islands are manually linked to neighbouring regions with which the islands have frequent ferry services. One remark is that most islands are island groups, and that only the larger places are connected to the mainland.

This way, Sabang (1172) is linked to Banda Aceh (1171), Nias (1201) to Sibolga (1271), Batam (2171) to Dumai (1408), Belitung (1902) to Bangka (1901), Selayar (7301) to Bira (7302), Alor (5307) to Flores Timur (5309) and Maluku Tenggara (8102, because of the direct link with Pulau Wetar), Sangihe (7103) to Bitung (7172) and Biak and Numfor (9409) to Yapen (9108).³

These modifications result in a spatial weights matrix in which all regions have neighbours (figure 20).

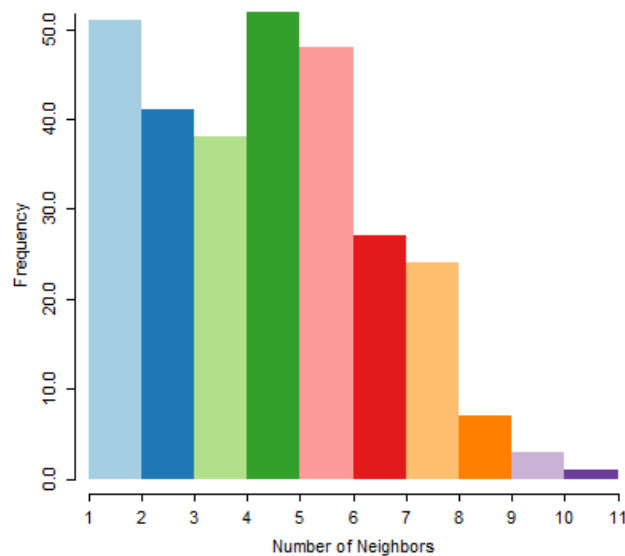


Figure 17. Histogram for the spatial weight matrix.

³ Alor and Maluku Tenggara used to be without neighbours, their link 'solves' two cases.

Regression results

In this part, the regression results will be described separately, and after that discussed in thematic order. In regression (1) the dependent variable is the clustering (LQ) rate for 2006, and the independent variable is the annual growth rate of the number of KIBS between 1996 and 2006. The use of this variable is possible because the comparison between the two datasets has not already been made in the LQ analysis. A number of control variables is calculated, that may explain the variance in clustering rates (see Chapter 3). In regression (2), the dependent variable is the annual growth rate of the number of KIBS between 1996 and 2006. The independent variable is the clustering rate for 1996. Note that the other explanatory variables are measured for 2006, and that in these cases association tells the story of the end point of growth, not on the actual ten year time span of growth.

(1) Spatial error model with KIBS clustering in 2006 as dependent variable

The OLS results show significance on the robust Lagrange Multiplier test for spatial error. Therefore, next a spatial error model is used. The results of both tests are shown in table 6. In this combination, the explanatory variables explain 54.5 % of variance in clustering. This indicates that the model is a very good fit. As all VIF values are below 2, there are no signs of multicollinearity issues. There are however some concerns on heteroscedasticity, as there is significance on the Koenker-Bassett test. As $p < 0.05$, we reject the null hypothesis of no association between KIBS clustering in 2006 and the explanatory variables.

We see significant positive links of clustering with growth of KIBS, related variety, the share of university educated people, versus significant negative links to the shares of manufacturing and oil and gas production.

KIBS clustering in 2006 as dependent variable				
	OLS		Spatial error model	
	T	P	Z	P
Growth KIBS	7.437	.000	7.321	.000
Selfemployed	1.772	.077	1.433	.152
Unemployed	-1.980	.049	-1.195	.232
Higher educated	10.345	.000	10.321	.000
Manufacturing	-3.232	.001	-3.201	.001
Oil	-2.270	.024	-2.570	.010
Unrelated variety	1.457	.146	1.337	.181
Related variety	2.609	.010	2.867	.004
N	292		292	
R ²	.529		.545	
Log Likelihood	-134.028		-130.608	
Robust LM (lag)	.207			
Robust LM (error)	.019			

Table 6. Regression results for analysis (1).

(2) Spatial error model with the annual growth rate of KIBS as dependent variable

In the second analysis the dependent variable is the annual growth of the number of KIBS between 1996 and 2006. As this variable has a ten year span, it is not surprising that the labour market variables for 2006 and the variables for manufacturing and oil and gas shares in 2006 miss explanatory power. We therefore limit the explanatory variables to clustering in 1996, to see if growth occurs in the former clusters; growth of other firms, to find signs of dependency; and unrelated and related variety, variables that address urbanization economies.

The OLS regression results show significance on the robust Lagrange Multiplier test for spatial error. Therefore, as a next step a spatial error regression is performed. This improves the R-squared and the individual variable significance. The regression results are shown in table 7.

Annual growth rate of KIBS as dependent variable					
		OLS		Spatial error model	
		T	P	Z	P
LQ_96		-11.983	.000	-12.398	.000
Growth of non-KIBS		10.148	.000	10.454	.000
Unrelated variety		3.836	.000	4.006	.000
Related variety		2.564	.011	2.696	.007
N		292		292	
R ²		.435		.479	
Log Likelihood		515.243		523.841	
Robust LM (lag)		.578			
Robust LM (error)		.005			

Table 7. Regression results for analysis (2).

When we test for the influence of KIBS clustering in 1996 on growth of KIBS in the next ten years, we find an unforeseen negative association. Apparently the 1996 clusters were not extended too much. Furthermore we see more related and unrelated variety and a significant higher growth of non-KIBS firms. This association between KIBS and non-KIBS growth suggests the existence of a certain social multiplier effect. Based on theories, that ascribe the power to create employment, production and investment to KIBS, we would expect that growth of KIBS has a positive effect on growth of other firms. But as only an association is found, the causation could be the other way around.

Again the VIF values are all below 2, which does not indicate any multicollinearity issues. The Koenker-Bassett test on heteroscedasticity does not have significant outcome, which is good.

Clustering in general

The regression results show that clustering of KIBS in 2006 is positively associated with growth of KIBS. In turn, growth of KIBS is negatively associated with clustering of KIBS in 1996. This points out that instead of expanding existing clusters, between 1996 and 2006 new locations for clustering have been found. Such a trend makes development of clustering seem more random in geographical space, and would point to less relevance of these clusters. In the case of Indonesia, it would not be fair to draw this conclusion. In the national level analysis we have seen that 1996 is quite early to start looking for KIBS clusters in Indonesia. We see that in the clustering outcomes too: in 1996 the national share of knowledge intense business services was low, which makes that regions that host some KIBS activity can appear as cluster, thus exaggerating the actual relevance of clustering.

The fact that the amount of KIBS firms has grown remarkably, creates possibilities for the emergence of KIBS clusters. It shows that social conditions and technologies are changing, which causes a need for specialist, knowledge intensive input to help firms with improving their business strategies and processes (Miles, 2005). This is in line with the theory of Eichengreen and Gupta (2013), who note that countries like Indonesia, located near important economic hubs, with democratic political systems and improving business policies, can in fact experience large scale knowledge based service growth, even when income per capita levels are rather low. Clustering also indicates that localization economies of specialization come to existence, giving the possibility for fast growth (Marshall, 1890). And indeed do the regression results show that clustering and growth of KIBS are positively associated. Overall, the clustering outcomes steer towards a positive explanation of service sector growth, because we find clear evidence of knowledge based development.

Labour market characteristics

In the KIBS clusters there is a significant higher share of university educated people. This underlines the theory that knowledge intensive business services go hand in hand with an emphasis on human capital. As the knowledge aspect is inherent to the nature of KIBS, this outcome was highly expected. The causation can work in both ways: either university graduates move to the clusters in their search for suitable jobs, or firms locate in the clusters because of the available labour pool.

Another labour market aspect, self-employment, does not give significant results in the first analysis results (except for the OLS results). Interestingly, it does when we perform the same analysis and leave out both unrelated and related variety. Now spatial error results show a positive association of self-employment and clustering, while R-squared is still high at 51.6%. The link of self-employment and clustering could suggest a vivid market, where people are inspired to take chances and create innovating businesses. However, another explanation of self-employment is necessity based entrepreneurship (Singer et al., 2015). We know that clustering causes urbanization, and that there are negative side effects to rapid urbanization in developing countries.

Especially unemployment could stimulate entrepreneurial activity. Again, in the first analysis results, we do not find associations between clustering or growth and unemployment rates (apart for the OLS results). However, when we exclude all variables that score high on correlation with unemployment (growth of non-KIBS, the share of higher educated, and related variety), we find a significantly positive association between clustering and unemployment. The R-squared is not too high at 28.1%, but there are no multicollinearity or heteroscedasticity concerns. Although the evidence on association between clustering and unemployment is not very strong, it prevents us from taking a solely positive stand on

the explanation of self-employment in KIBS clusters. Both the innovation and necessity based entrepreneurship interpretations are credible, and that makes it impossible to interpret this as sign of either deindustrialization or marginality.

Economy characteristics

As for the surrounding economic spheres, we find significantly less manufacturing and oil and gas production in the KIBS clusters. For the oil and gas variable, this is quite a logical outcome because oil and gas production are strongly connected to the location of extraction, not to cities. Manufacturing is dependent on larger numbers of workers, and will (depending on the transport costs of output) be more likely to be located in cities.

The negative association of clusters with manufacturing and oil and gas could limit the urbanization economies of diversification, that would result in a stable and beneficial economic climate (Jacobs, 1984). On the other hand it shows that KIBS have a position of their own, and are not just following demand in oil and gas production and manufacturing. Either there has been a transition in the clusters, moving away from these industrial activities, or these activities were locally never essential to begin with. Again this is a positive sign, suggesting quality and relevance of these services, and therefore a positive explanation of service growth.

Urbanization economies

Looking at the indicators for urbanization economy effects, unrelated and related variety, we see a significant higher level of both in regions that experienced strong KIBS growth, and a significant higher level of related variety in the 2006 KIBS clusters. This is in line with the expectation of Frenken et al. (2007), that related variety will give the strongest correlations, because knowledge spill overs occur primarily between firms that sell related products.

We can conclude that the regions that have experienced knowledge intensive business services growth tend to have favourable, diversified economic climates in 2006. In the clusters, we find more related service sector activity, pointing at the existence of urbanization economies. We can identify the 2006 KIBS clusters as places of both specialization and diversification, giving possibilities for fast and strong, and long-term and stable growth of the regional economy. These conditions of the economic surroundings are promising, and make it very much imaginable that Indonesian regions are taking important steps on the path towards a knowledge based economy.

Social multiplier

In order to examine whether a bigger change in the economy can be identified, we test if there is a social multiplier effect in terms of growth of non-KIBS firms. Therefore we look at the effect of both clustering of KIBS in 1996 and KIBS firm growth on the regional growth of other firms between 1996 and 2006. Both clustering and growth of KIBS show positive associations with growth of the number of other firms. Based on these results, one could argue that clustering and growth of KIBS is beneficial to the regional entrepreneurial climate. Of course, causation is not proven and the entrepreneurial climate has its effects on clustering of KIBS too.

In conclusion

In the search for an explanation for service sector growth in Indonesia, this chapter addressed the regional level indicators of a transition to a knowledge based economy. These include clustering, growth of knowledge intensive business services, social spillover effects, labor intensity and infrastructure expenditures. The regional analysis in this chapter gives contradictory results on development.

Overall these regional indicators project an image of a country that is taking steps towards a knowledge based economy. Focussing on an important characteristic of a knowledge based economy, the knowledge intensive business services, we find remarkable growth of the number of firms between 1996 and 2006. Clusters of these services are relatively new, but promising they are, showing signs of both localization and urbanization economies. And even more because clusters are dispersed over the archipelago, giving possibilities of knowledge based growth (stimulating wealth, employment and economic development) to previously less developed islands.

In the KIBS clusters we find more growth of KIBS, higher shares of university educated workers, and higher shares of self-employment. The higher shares of university educated workers are in line with the national level results on education, which show a staggering growth of the importance of human capital. The reason for the higher levels of self-employment in the KIBS clusters is ambiguous, as it can be explained from an innovation perspective, but also from a necessity based entrepreneurship perspective.

We find that although growth of KIBS is positively associated with growth of other firms and variety inside and outside the services, it is not dependent on industrial activities as manufacturing and oil and gas production. This indicates that KIBS have a relevant position of their own, and steers towards the positive explanation of service growth: knowledge based development.

Although Indonesia has already experienced societal transformations that improve the political, organizational and trade position of the country, not all is adapted to knowledge based development. We find that accommodating systems of capital investment and infrastructure expenditure are not matching the development of KIBS clusters. In both business and government policies the focus is still very much on the primary sector. To some extent this is reasonable, given the fact that Indonesia has important locations for natural resource exploitation. But given the amount of aspirational writing of both businesses and governments, one would expect more effort to accommodate knowledge intensive business service growth.

Chapter 6 | Conclusion

The past forty years have brought Indonesia significant economic changes in the form of industrialization and fast growth, a growing orientation on export, a dramatic 1997-1998 Asian crisis, and finally recovery from that crisis. The recovery was matched by the growth of service activity, compared to manufacturing. And, by a set of societal transformations, that brought democratization, decentralization, and improvement of business licensing and access to education. This creates opportunities for international connectedness, growth, and overall development towards a more advanced, knowledge based economy. This would cause a structural change in the economy, and if Indonesia goes through such a transition, this will have strong effects on society at large.

As services are one of the main characteristics of a knowledge based economy, and we observe growth of these services, it is necessary to study the elusive nature of the services in Indonesia. This can lead to insight on how to interpret service sector growth in Indonesia. Therefore the research question is:

'To what extent does the growth of the service sector in Indonesia reflect a positive explanation of a shift of economy type, and a negative explanation of marginality?'

The first hypothesis would have to be backed up by positive changes in a range of dimensions of a knowledge based economy: sectoral contributions to GDP, participation in the global economy, the importance of human capital, and quality of service activities. These topics are studied on both a national and a regional level. As for the second hypothesis, dimensions that capture marginality are often qualitative in nature, which exceeds the scope of this research. Therefore marginality is approached as the inverse of progression. This means that we look for negative changes in the same dimensions.

Indonesia's developmental path so far is one of moderation. The sectoral shares of (wide variety) services in the Indonesian economy, have on average been growing over the past fifty years. But when comparing this with the other MINT and BRIC countries, Indonesia lags behind in the sense that it has had a more stable growth path, that lacks steep or otherwise substantial growth. The explanation can partly lie in Indonesia's extraordinary geography, where there are many islands, with heterogeneous regions, indigenous cultures, and natural resources.

But recently other, more significant changes become apparent. Like the rising number of foreign direct investment, that show growing international connectedness. At the regional level we study knowledge intensive business services (KIBS), that are often referred to as innovation, employment, production level and investment enhancing. Overall, we find a strong growth in employment in this subsector, which reflects changing social conditions and technologies, and a need for specialist, knowledge intensive input to help firms with improving their business strategies and processes (Miles, 2005).

As expected in the early stages of industry development, knowledge intensive business services are clustered in a clear pattern, suggesting the existence of localization economies that give regions opportunities for fast growth (Marshall, 1890). Localization economies are known to accommodate more competition. This results in higher levels of specialization and efficiency, enhancing the quality of services.

Surprisingly the location quotient results shows that knowledge intensive business services are more dispersed than expected. That means, not only present on the most developed islands of Java and Bali, but also in urban (often coastal) areas on other islands. We see very similar signs of dispersion in the spatial pattern of FDI. The conclusion is that the clustering of KIBS services does not explain current levels of development or national economic power relations. What it can show is the locations and regional patterns of future development. Given the positive side-effects of KIBS that are seen in literature, the scattered pattern of clusters is promising for a wide range of regions.

We see a stronger emphasis on university educated knowledge workers reflected in the KIBS clusters. This is in line with the national level analysis, where on the labour market, a large increase of university educated workers becomes visible in the wide variety service sector. This shows a new emphasis on knowledge, and that counts as one of the characteristics of a more knowledge based economy. Although the largest density of knowledge workers is to be found in financing, insurance, real estate and business services (approximately KIBS), by far the largest number work for the government. This shows that all kinds of social and economic infrastructure for economic growth are being established. As this is a stage that often precedes transition, this means that it is too early to conclude that Indonesia's economy is already predominantly knowledge based.

In the clusters there is a significant higher level of self-employment. However, it is not clear if this is caused by the dynamics and opportunities of the regional economy, or by the negative side-effects of urbanization, which can stimulate necessity based entrepreneurship.

The industrial activities of manufacturing and oil and gas do not explain the need for knowledge intensive business services, which is a sign that the KIBS have an economic role of their own. On the other hand this could limit the urbanization economies, that would result in a stable and beneficial economic climate (Jacobs, 1984). As for the existence of urbanization economies, we can conclude that the regions that have experienced knowledge intensive business services growth tend to have favourable, diversified economic climates in 2006. These services may have contributed to this climate, but we don't know to what extent. On top of that, we find significantly more related variety in KIBS clusters, pointing at the existence of urbanization economies. This is beneficial to the sustainability of knowledge based development.

We found that infrastructure expenditure decreases significantly with increasing clustering rates, and that the biggest recipients of infrastructure expenditure are regions with important natural resources. This indicates that, although much is written about the importance of the service industry, this does not translate in infrastructure policy priorities yet: infrastructure policy is still very much focused on the primary sector. In the business environment a similar trend is apparent: high levels of capital investment, that would go hand in hand with low labour intensity, are negatively linked to the knowledge intensive business service clusters.

Significant service sector growth in Indonesia: change for the better?

To sum up, there are many signs that Indonesia is moving towards a more knowledge based economy. As a first step, the societal transformations show that a certain social and economic infrastructure is being built, mostly by public institutions such as hospitals, schools, transport services, postal and telecommunications. This prepares the country for further knowledge-based development. Other societal transformations in Indonesia are promising too. The growing participation in ASEAN, the democratization and changes of business policies would make Indonesia ready for a wave of knowledge based services, even though income per capita levels are lower than they normally should be (Eichengreen and Gupta, 2013).

An important feature of a knowledge based economy is the focus on innovation, knowledge and learning. We find a risen emphasis on these aspects, both in the increase of higher educated workers and in the growth of knowledge intensive business services, that are typically involved with the creation and transfer of innovation and knowledge. Growth of these services reflects a larger trend of technological change and specialization in society. This, and the lack of dependency on industrial activity, indicates that KIBS have a relevant position of their own

We find relatively new but promising clusters of knowledge intensive business services, that show signs of both localization and urbanization economies. In these favourable economic climates, not only the KIBS experience growth, other firms do too. This gives opportunities for both fast and long-term, stable growth.

The past twenty years there has not only been decentralization of power, but also matching dispersion of FDI locations and, to a larger extent, of KIBS clusters. This brings innovation, knowledge and learning, all factors that can stimulate the creation of wealth, employment and economic development, to more areas of the archipelago.

All this shows that Indonesia has taken its first steps on the road towards a more knowledge based economy, and suggests that service sector development in Indonesia means change for the better. But there are still ways to improve. Clustering of KIBS bring possibilities for growth and innovation, but as proximity is crucial, this should be accompanied by proper planning of infrastructure and investment. This does not show, as both infrastructure expenditure as capital investment is focused on resource rich areas. In order to truly benefit from development towards a knowledge based economy, changes need to be made on these points.

Furthermore it is important to note that transition is a time consuming process and that change can be subtle: a shift to a more knowledge based economy does not have to mark the end of the primary and secondary sectors. This is especially relevant for the Indonesian archipelago as it has very resource-rich areas and land that is well suited for agriculture because of its volcanic origin, as well as a very large labour force that is not trained for service activities. Most likely, polar opposites will keep appearing, and that will result in challenges concerning regional disparity and inequality. That means that Indonesia's developmental story will continue to be an interesting and unique topic of study, for decades to come.

Discussion

One important notion is that it appeared that 1996 was quite early to look for KIBS clusters in Indonesia. Because of the low number of KIBS firms, the results were somewhat exaggerated. After ten years, a large part of the clusters was located in different locations. In this thesis, we were limited

to the 1996 and 2006 Economic census data. We expect that the 2016 data (which are conducted but not published yet) will give more insight on this topic.

Secondly, the oil and gas variable is a dummy which exaggerates the effect of oil and gas production. This reduces the explanatory power of this variable. Labour intensity is an indicator that is approached by the regional level of capital investment as its inverse. This may blur the result.

Based on the regression results, we fail to find some positive side effects of KIBS clusters. That would be the decrease of unemployment rates, the increase of population density and possibly an increase of firm sizes. These variables did were either not reliable or did interfere with the results.

Regression (1) gave significant results on the Koenker-Bassett test. This points at heteroscedastic concerns, which can trouble the regression outcome. It would be more ideal if heteroscedasticity could be avoided, while still using a spatial model.

Future references

If reliable data on firm sizes can be found, it would be interesting to look for a difference in the capacity of firms to include people in development. This could be measured by a correlation between firm size and regional employment growth. In this thesis we assume that the competition of localization economies results in more efficient, productive firms. This lies in the economies of scale argument. But that does not have to mean that large firms are not by definition better firms. Ayyagari et al. (2014) find that in developing countries, small firms contribute significantly to employment and job creation. And these are the firms that are hindered most by institutional constraints. As small firms are especially numerous in Indonesia, and the number of small firms per capita is much higher than in most other countries, it is relevant to test where the small firms are located and what their economic importance is (Kushnir et al., 2010). This could result in interesting insights that are useful for policy making.

For now we know that knowledge intensive business services give tremendous possibilities for development, in regions all over the archipelago, and it will be interesting to see what the future holds for the economic development of Indonesia.

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Appendix 1 NACE Codes

NACE Division 72: Computer and related activities

72.1: Hardware consultancy;

72.2: Software consultancy and supply;

72.3: Data processing;

72.4: Database activities;

72.5: Maintenance and repair of office, accounting and computing machinery;

72.6: Other computer related activities

NACE Division 73: Research and experimental development

73.1: Research and experimental development on natural sciences and engineering;

73.2: Research and experimental development on social sciences and humanities

NACE Division 74: Other business activities

74.11: Legal activities;

74.12: Accounting, book-keeping and auditing activities; tax consultancy;

74.13: Market research and public opinion polling;

74.14: Business and management consultancy activities;

74.15: Management activities of holding companies;

74.20: Architectural and engineering activities and related technical consultancy;

74.3: Technical testing and analysis;

74.4: Advertising;

74.5: Labour recruitment and provision of personnel;

74.8: Miscellaneous business activities n.e.c.;

74.81: Photographic activities;

74.84: Other business activities n.e.c.

Note: the broad divisions here include some subsectors that are probably not strictly KIBS. Thus the following have been omitted from the list: 74.6 (Investigation and security activities); 74.7 (Industrial cleaning); 74.82 (Packaging activities); 74.83 (Secretarial and translation activities).

NACE 71, excluded from the list above, involves Renting of Machinery and Equipment: it is often grouped together with these sectors (and in turn, these are also often aggregated together with “real estate”, and then in turn this group with “financial intermediation” for purposes of statistical analysis.

Source: Miles (2005)

Appendix 2 Codes for KIBS

		KKKP	KBLI
J	Financial Intermediaries except insurance and pension	8111-8190	65110-67209
K	Real Estate	8211-8212	70102
	ICT services	8230	72100-72900
	Research and Development	8240	73110-73220
	Other Company Services	8291-8295	74110-74920
M	Education services	9229	80921-80929