

# CREATION OF STRUCTURAL EMPLOYMENT OPPORTUNITIES IN CRIMPING REGIONS AND THE INTER (NATIONAL) TRADE GAP: A CONCEPTUAL AND EXPERIMENTAL APPROACH

*Shilpa K. Samplonius-Raut, Senior lecturer*  
*Jan Waalkens, Prof.*

Stenden univeristy of applied sciences, The Netherlands

---

## Abstract

Europe 2020 is the EU's strategy to promote the sustainable growth. One of the five ambitious objectives to be reached by 2020 is in the area of employment, whereby it states that 75 % of the population aged 20-64 should be employed. The European Union has provided special attention to the problem related to the crimping regions. The lack of employment opportunities in general and lack structural employment in specific is one of the important characteristics of crimping regions. Among others UWV (Dutch National Employment Office) in its report 2011-12 advises that the regions need to develop a certain economic specialization in order to retain the employment opportunities within the regions.

The generation of employment is one of the most important objectives that dictates the policy in the crimping regions. In this paper we explore how this problem can be addressed on the regional level aiming to aid policymakers. The paper concludes with the possible changes in the economic measures to achieve the generation of structural employment in the region. Therefore we firstly provide the rationale of why specialization of regions might help in lifting the burden of the crimp and secondly how taxing of output instead of tax on input such as labour might help to decrease factor costs. As a result of such a decrease the competitive advantage of a region can improve. Thirdly we present an experiment on labour costs with the so called Prohef model introduced by Piet van Elswijk.

---

**Keywords:** Employment opportunities, trade gap, crimping regions

## **Economy of crimping regions**

The continuous stream of monetary flow emerging from different transaction characterizes any given modern, open European economy. A crimping region in an economically developed country such as the state of the Netherlands is not an exception to this. Crimping region manifests itself through high unemployment, low income, low levels of housing health and educational facilities and the dominance of the regional economy by only one or two industries which are in a state of long-term decline. Substantial out migration of labour, out flow of capital or both, low growth of aggregate output area other prominent indicators. A crimping region has to adhere to the national policy, rules and regulations as regards to the among others input factor pricing which inhibits interregional wage differences despite the possibility of different marginal productivity per region.

The Dutch industries are considered rather network oriented than agglomeration oriented. The crimping regions form no exception to this. Considering the determinants of attractiveness in terms of investments regional authorities have to evaluate their sector structure in the light of maximum comparative advantage. The Planbureau voor de leefomgeving (PBL) has carried out an intensive study about finding out the possible investment areas for Province Drenthe. The regional competitive factors to determine the position of a particular region such as Drenthe are listed in table 1 ( PBL 2013). The regional labour productivity measured as GDP/employment is an essential indicator of the relative position of a region.

They have taken ten sectors on the basis of elsewhere carried out methodological study to select these sectors. These sectors are plotted against the competitive location factors. These locational factors to attract investments are urbanization, international private research and development, the high tech and chemical clusters. Currently a chemical cluster is developing in Drenthe, whereas the score on other promising sectors, the so called top sectors (of which 9 are defined) in general, is low.

A national competitive advantage is a function of regional competitive advantage. Just as the national product, the regional product should have also the equilibrating streams in the income identity equation. The identification of the outflows is thereby of great importance. The full employment is an equilibrating force, the generation of employment is therefore one of the most important objectives that dictates the policy in the crimping regions. The high level group reflection on Future Cohesion Policy (2011) talks about three regional categories which is employed by the OECD, namely Knowledge hubs, Industrial production zones and Peripheral regions. The notion of smart specialization as introduced by Foray, David and Hall in 2009 assumes that regions should be able to identify through an

entrepreneurial process favourable location factors to build up a comparative advantage and innovation.

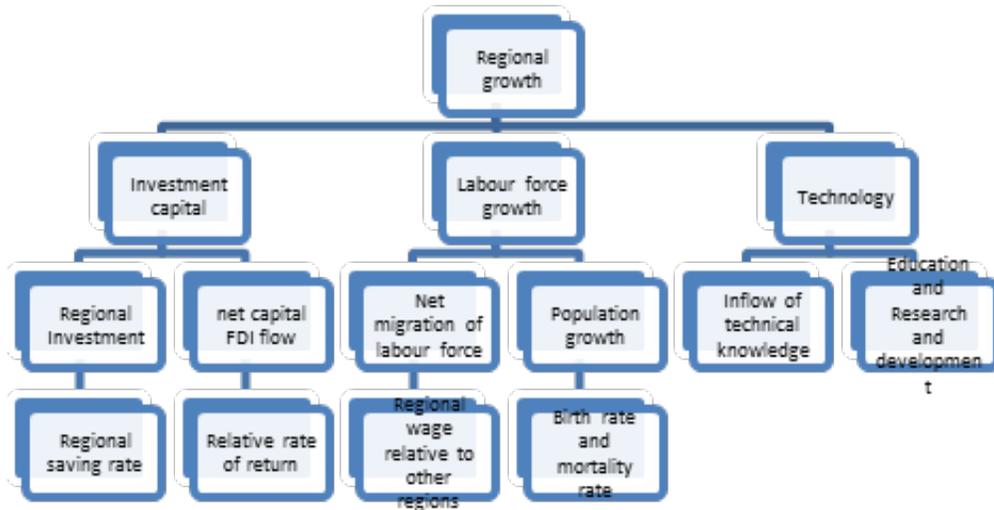


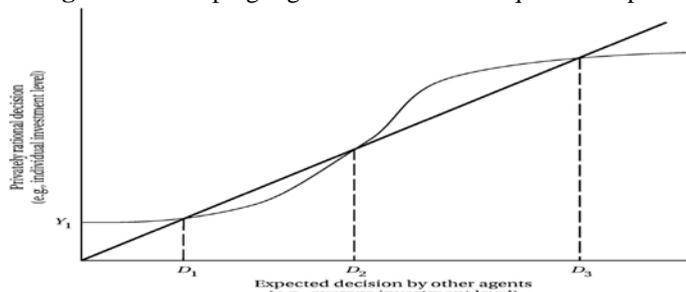
Figure 1: Factors leading to regional growth

### Crimping region as an unstable equilibrium point

We put forward a theoretical suggestion that crimping region represents an unstable equilibrium point such as in the diagram 1. The crimping region finds itself on D2.

We are aiming at possible changes in the economic measures to achieve the generation of structural employment in the region. For this we have to understand the rationality of investment decisions (the S shaped curve). This aids in understanding where government intervention might be desirable. We argue that this might be the case when the equilibrium state is distorted, as in crimp regions. We propose that the crimping region is away from the point of Stable equilibrium: D1 and D3. On these points the development authorities and the corporate sector adjust their investment decisions in coordination with average investment in a given area.

Diagram 1: Crimping region as an unstable equilibrium point.



(Source: Poor Economics Banerjee A. and Duflo E. and Pearson Addison-Wesley.)

The critical point is that of D2, a point of unstable equilibrium. As the development authorities and or corporate sector coordinate their investment decisions, equilibrium might move to D1 whereby it suffers decreased investment. Or it might move to D3 where an area gets boost through the injection of investment. A right mix of policies will push it to D3 toward sustainable international trade by developing smart specialization. Based on maximizing comparative advantage. A failure to develop will lead to disruptive International trade.

### **General objectives aimed at crimping regions**

Given the problems of the crimping regions, the general objectives aimed at the crimping regions are:

- To generate the structural employment in the crimping region.
- To increase savings through creating more employment opportunities so that there will be more means for investments.
- To generate employment opportunities through lowering down the input factor costs; for example the labour costs or rent costs.
- The prices of goods and services reflect the input factor prices. The lowering down of the factor costs, labour costs in particular, has also a direct impact on the competitiveness in the international market.

As far as the national recommendation to develop a certain economic specialization in order to retain the employment opportunities within the region is concerned we can ground this advice in economic theory. The Pareto theorem on international or interregional trade learns that specialization in sectors in which the comparative advantage is highest leads to optimization of the economy. Furthermore, if we consider a region as a firm, management literature suggests to focus on core competencies (Prahalad and Hamel 1994) in order to maximize returns. This specialization needs to be selected keeping into account the availability of labour in the crimping region which is characterized by the decreasing labour force. The input pricing such as wages for labour is very crucial in the crimping regions.

### **The Prohef concept**

The current literature in Economics fails to integrate the social welfare contributions on the labour in its production function. The study will make use of the Cobb Douglas production function. To carry out a comparison of a theoretical derivation of the production function there will be a derivation of production function; one without Prohef system and one incorporating the Prohef model.

Factor pricing: This is a theoretical exercise to show the necessity to introduce the taxes on the marginal productivity of the labour, that is the additional product produced by the extra unit of labour. The consequence for

an individual firm is that in times of a boom the firm pays more tax than in the old situation where labour was taxed (fixed sum related to the number of employees), whereas in times of slump labor is relatively cheaper because the total sum of taxes is a percentage of output instead of input which at that point is relatively low. This is the essence of the Prohef system, an alternative taxing system advocated by Piet van Elswijk.

A national competitive advantage is a function of regional competitive advantage. Just as the national product, the regional product should have also the equilibrating streams in the income identity equation. The identification of the outflows is thereby of great importance. The full employment is an equilibrating force, the generation of employment is therefore one of the most important objectives that dictates the policy in the crimping regions. Experimentally an attempt is made to build a model which connects the Prohef systematic to the problematic of crimping regions.

This is a theoretical exercise to show the necessity to introduce the taxes on the marginal productivity of the labour, that is the additional product produced by the extra unit of labour. The consequence for an individual firm is that in times of a boom the firm pays more tax than in the old situation where labour was taxed (fixed sum related to the number of employees), whereas in times of slump labour is relatively cheaper because the total sum of taxes is a percentage of output which at that point is relatively low.

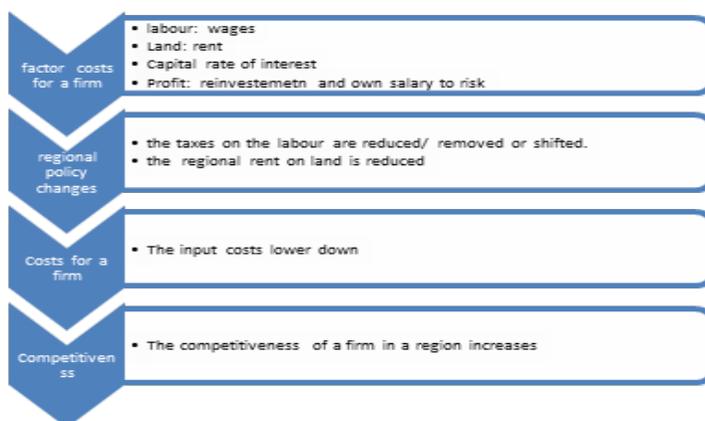


Figure 2: Prohef model working: From input to output tax

The basic Cobb Dougals production function is used for this purpose. The concept of marginal productivity is important to determine the share of input into the final product. The reasoning is as follows:

- The input prices are not determined according to marginal productivity.

- The input prices, like wages are the price of labour, is paid by an entrepreneur.
- The entrepreneur needs to pay an input price which consists of a uniform percentage centrally determined social security contribution.
- This percentage is uniform, irrespective of sector and other qualifications like productivity that a labour might possess.
- The share of input into the total is therefore not easy to determine.
- The entrepreneurs might overpay or underpay for the contribution of input; depending on the marginal productivity of labour.
- The marginal productivity is as such complicated if not difficult to be determined on the basis of input prices.
- This results in irresponsible higher prices for the products on the basis of higher input prices and unnecessary exposure of risks by entrepreneurs.
- This calls for duties/ levies or taxes on the other side of production function than the taxes on input

In the Prohef model the extra revenue added by the additional labour can be taxed. This implies that in the boom times the entrepreneurs need to pay extra tax, which they can afford to pay and in the recession times lesser because the tax is no longer based on the cost of the labour force but on output. Because of this in slump times labour is relatively cheap.

**Formalization of the model:**

Given a set of input prices of homogeneity; of any degree; of production function.

$$Q=AK\alpha L\beta \dots\dots\dots Eq1$$

Choosing homogeneity would mean.

$$A (jK) (jL) = j (AKL)= j Q \dots\dots\dots Eq2$$

For any positive output

$$AKL=QO (AK,L,QO>0)$$

Taking logarithms

$$\ln A + \alpha \ln K + \beta \ln L - \ln Q = 0 \dots\dots\dots Eq3$$

This defines implicitly that capital is a function of labour. A= for any given K and L the magnitude of A will proportionately affect the level of Q. A can therefore be considered as an indicator of the state of technology or as an efficiency parameter. If each input is assumed to be paid by the amount of its marginal product the relative share of total product accruing to capital will be  $K(\delta Q/\delta K)/Q = KA\alpha K\alpha-1/LAK\alpha=\alpha$  Similarly labour’s relative share will be  $L(\delta Q/\delta L)/Q = LA(1-\alpha)K\alpha/ LAK\alpha= 1-\alpha$  Exponents of each input variable like  $\alpha$  indicates the relative share of that input in the total product. Exponents of each input variable can also be seen as the partial elasticity of output with

respect to the input. Since  $\delta Q/\delta L/ Q/K$  Assuming the Solow's growth model where K, and L are expected to approach constant as its equilibrium value because Solow analyses a growth case where K and L can be combined in varying proportions over infinite time. It also varies directly with propensity to save and inversely with the rate of growth of labour.

Regional income defined as a sum of all the products and services producing during a year. The national income is same as the national output produced during a year expressed in monetary terms. This holds true for regional flow where every  $Y = \sum_1^n Y_1 + Y_2 + Y_3 + \dots + Y_n$  (S-I)+(T-E)+(X-M) For a country. GNP identity  $Y = (S-I) + (T-G) + (X-M)$  Summation of all the state GDP's  $Y = (Y_1 + Y_2 + Y_3 + \dots + Y_n)$  N= Number of provinces/ state entities in a given country) For the state of Netherland n= 12). Each state has its own regional income identity.

$$Y_n = (S_n - I_n) + (T_n - E_n) + (X_n - M_n).$$

Y=national income S= savings I=Investment X=Export I=Import T=Tax revenues G= Government expenditure.

In this identity we will focus on export and import and savings and investment. Important constraints here are as defined by the inflow of monetary stream.

- Does the regional saving get pumped back as an investment?
- There is no quid pro quo when it comes to taxes, but the proportion of central taxes to the central expenditure in the region could serve as an indicator.
- The interregional and foreign trade here would include the exports to
- and imports from other regions and countries.

The saving quote 's' depends on the saving propensity of the marginal income  $s = S/Y$ : where Y depends on productivity or output income. In the crimping regions the Y is low, which results in a lower value of s, the saving quote. A lower value of saving quote would result in lower investment.

### **Rationale of the case research Drenthe**

*The province of Drenthe finds itself on the verge of crimping, it has not passed the critical line of depopulation. It has one of the extensive health care for seniors and welfare facilities. In the short term this is a boom. For the long term there awaits a different story, if the current demographic situation remains to continue as it is today. The demographic facts show the first symptoms through lower natural population growth or absolute amount of the population is decreasing: denoting that the birth rate is lower than the total mortality rate. The general facilities which make a residential area more livable for the families show erosion; like the number of supermarkets, restaurants, primary schools, entertainment etc. The aging population implies*

the ever rising proportion of above 65 years of age. This does not need to be a problem in the short run. As the senior citizen facilities expand, it may lead to more demand for the skilled and unskilled labour for the health care and welfare of senior citizens. Demographic development of Province Drenthe 3 February 2010 Main report: Employment structure: number of employment in the industry sector is the highest 17% followed by trade and the health sector. The relative higher population above 50+ population is apparent.

The problem of employment has been recognized at national level and at provincial level. The decline in the employment opportunities in the province of Drenthe was twice as high as the share of labour employed in 2009. (CBS 2009 report). The provincial government of Drenthe has a ten point policy programme. The ninth point talks explicitly about diversified economic measures with the objective to generate and retain the employment opportunities. The province of Drenthe with a per capita gross domestic product just a little bit above €25,000 in 2009 ranked the lowest among the twelve Dutch provinces. The skilled labour prefers to emigrate. The immigration rate is lower than the emigration. The information search costs for both the potential employer and the potential employee for the highly educated labour force may increase. This reinforces the emigration way from the crimping region. Along with the sector like the social infrastructure tertiary health care, medical specializations, higher education, the service sector like Information and technology, banking show a steady decline.

Table 1: The current comparative advantage of Drenthe (based on study by PBL)

Sectors	Volume export ranking	Comparative advantage equal to or above average	Most important determining factor
Agriculture	33	Air connectivity Road connectivity	The population size
Food industry	111	Not a single factor	Share of foreign companies in the concerned sector
Material industry	194	Not a single factor	""
High Tech industry	197	Road connectivity Water connectivity	The share of export /Share of foreign companies in the concerned sector
Chemical	141	Not a single factor	Share of foreign companies in the concerned sector
Energy	59	Not a single factor	""
Logistics	205	Road connectivity	""
Corporate services	131	Not a single factor	""

To categorize the province of Drenthe, which is almost on the verge of the crimping, it is easy to opt out it as a knowledge hub, because there is no top ranking university, or university with academic, medical or any fundamental academic research. Even though the number of percentages working in the industry is 17%; cumulatively it is not the highest and does not show any other demographic signs of any the thriving industrial city, we categorize it as a peripheral region. Each type of the region calls for a context specific solution to the problem of lack of structural employment (see the appendix on policy advice for peripheral regions). The different characteristics of the crimping region are matched with the determining variables relating to generation of structural employment.

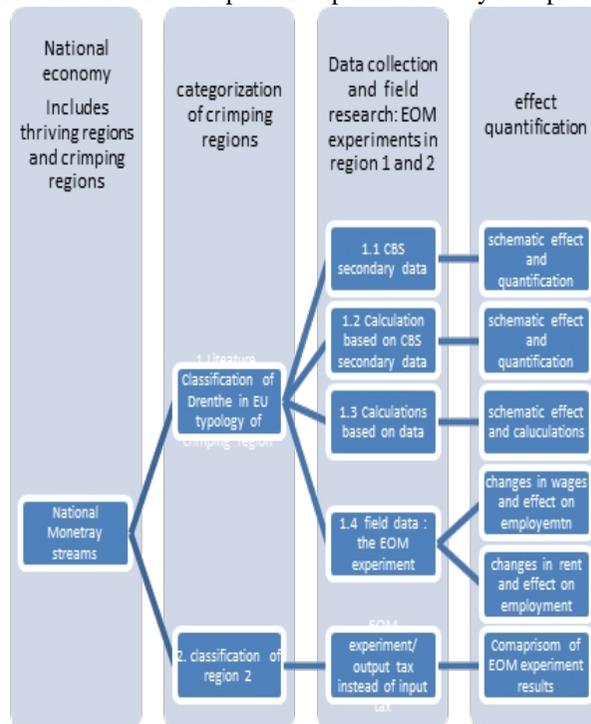
Having defined it as a peripheral region the thematic priorities and policies are mentioned in the appendix. Some of them can be put into appearing in the short run are mentioned briefly in the next paragraph to show the potential nexus among the role of the university, the EU policy indicator and the need of the region :

- Strengthening the scientific base: the science fab lab of Stenden university of applied sciences is an excellent example of an effort towards this.
- Supporting non Rand D innovation: the role of Stenden univeristy in advising the processes and market research.
- Promoting the internationalization of firms due to advantages of smart specialization: the Stenden university role in supporting the firms in the international market research is noteworthy.
- Removing barriers to funding for SMEs: the role of lowering the input prices such as labor by implementing Prohef is an excellent idea. It lowers the burden on the entrenrpeneur, the idea is related to social value added tax. The entrepreneur can higher the labour as much as needed without concerning the premium which an entrepreneur usually needs to pay for the labor. This lowers the cost and thereby enhances employment.

### **Experiment with labour tax**

The shifting of taxes from input to output: prohef model implementation ranges from the labour to output taxation to the integration of the budgetary resources. The proposed study makes a current diagnosis of the region of Drenthe. It provides an extensive account of the Prohef experiment which has been described and its impact on the employment generated by creating a competitive edge in the region.

**Figure 3:** The model for a set up of an experiment study is depicted in figure 3



The Prohef model includes a number of policy changes, from shifting taxes from labour to the revenue and the integration of the budgetary means. The application of this model for a region is expected to benefit the regions in terms of its competitiveness and the employment generation. The Dutch government has started a process of decentralization the minimum welfare assistance is already left to the discretion of the municipalities. The further decentralization of the unemployment benefits is also in the pipeline. This creates more opportunities for the provinces and municipalities to undertake the activities on its own to defend its regional economy.

**Results and discussion**

The aim of this paper was to explore how we can guide policymakers which are confronted with the problem of a crimping regional economy. Two topics, economy & sector structure, and the pricing of input factors, labour in particular, were discussed. We found some encouraging insights. The advice that regions should specialize is firmly grounded in economic theory and may therefore serve as a useful policy guideline. Regions should maximize their comparative advantages as to optimize the sector structure and the economy. Selection of favorable sectors should be done on the basis of the backing winners principle. Input factor costs like labour costs make up a

large share of the budget of companies and are therefore very important in making the regional economy internationally competitive. Already the Prohef method is validated in a number of regional experiments with promising results. Applying the insights that are developed in this paper can aid in pushing the regional economy away from the unstable points and towards the sustainable international trade by developing the specializations as suggested in the peripheral region. The combination of the forces of government policy, academic talents and regional needs are key to sustainable economic success.

The European social security system provides the protection against poverty in threefold; poverty due to illness, poverty due to lack of employment and poverty among the senior citizens. The problem is that the costs of this system are ever harder to bear. Innovative experiments such as Prohef ought to be conducted, as Mr Geert van Istendal puts it (article Ode December 2012) : It is of essential importance to maintain the social welfare state which is a key feature of the European system.

#### **References:**

- Banerjee A. and Duflo E. (2011) Poor Economics: radical rethinking of the way to fight global poverty, MIT press, The U.S.A. First edition chapter 1 21-59.
- Brezzi, Dijkstra , M., L. and Ruiz V. (2011), “OECD Extended Regional Typology: The Economic Performance of Remote Rural Regions”, OECD Regional Development.
- Central Bureau of Statistics (2010), The Netherlands. De regionale Economie.
- UWV (2011) UWV werkbedrijf arbeidsmarkt prognose 2011-2016 met een doorkijk naar 2016.
- EC (2011) High level group reflecting on the future cohesion policy: meeting no 8, outcome indicators.
- Ecorys (2011) Ecorys report 2012 on Drenthe.
- ESPON (2013) Espon typology compilation scientific platforms and tools.
- Experiment CREED (2001); Vrij university of Amsterdam.
- Hogerbrink A. and Narula R. MERIT (2004-006) location and agglomeration of FDI in The Netherlands: implications for policy.
- OECD (2011) Working Papers, 2011/06, OECD Publishing. <http://dx.doi.org/10.1787/5kg6z83tw7f4-en>.
- Planbureau voor de leefomgeving: PBL (2013); De internationale concurrentiepositie van de top sectoren in de provincie Drenthe.
- Hamel G and Prahalad C.K.P. (1996) Competing for the Future Harvard Business Review Press; First Edition edition

Prohef foundation 2001 Summary of Rotterdam Prohef experiment. Province Drenthe (2012) Kader voor Economische Investerings , herijking and Jaarprogramma (KEI).

Spiezia V, and Weiler S. ( 2007) Understanding regional growth, the review of regional studies vol. 37, No. 3, 2007, Pp 344-366 SSN 1553-0892.

Stenden university (2013) : Van Elswijk "support van krimpbeleid door hogescholen".

Topteam Hoofdkantoren: Ministry of Economic Affairs Actie Agenda ter verstrking van het vestigingsklimaat.

Van Elswijk P. (2007) Economie op Mensmaat. The opening lecture of mr Elswijk at the installation in the univesity knowledge tank.

Van Istendael, G. (2012). 'De sociale zekerheid is de kern van Europa en die verdwijnt' NRC handelsblad Weekend New York Times, December 16.

#### **Appendix 1: Peripheral regions: thematic priorities and policies:**

##### **1)Strengthening research and technological development: strengthening the scientific base.**

1.1) Strengthening the scientific base: the science fab lab of Stenden university of applied sciences is an excellent example of an effort towards this.

1.2) Fostering international research collaborations.

1.3) Supporting industrial R and D.

1.4) Fostering the commercialization of public research.

1.5) Encouraging the Rand D investment of firms not previously performing R&D

##### **2) Promoting innovation and smart specialization.**

2.1) Fostering the creation of new firms in knowledge intensive circuits.

2.2) Supporting the growth of the new firms in knowledge intensive sectors.

2.3) Supporting the fast growth of companies in all sectors.

2.4) Supporting non Rand D innovation: the role of Stenden univeristy in advising the processes and market research.

2.5) Promoting the internationalization of firms due to advantages of smart specialization: the Stenden university role in supporting the firms in the international market research is noteworthy.

2.6)Fostering the innovation capabilities of SMEs.

##### **3) Enhancing accessibility to and use and quality of information and communication technologies.**

3.1) Ensuring access to broadband services for all.

##### **4) Removing obstacles to the growth of SMEs:**

4.1) Removing barriers to funding for SMEs: the role of lowering the input prices such as labour by implementing Prohef is an excellent idea. It lowers the burden on the entrepreneur, the idea is related to social value added tax. The entrepreneur can higher the labour as much as needed without concerning the premium which an entrepreneur needs to pay for the labour. This lowers the cost and thereby enhances the employment.

##### **5) Removing bottlenecks in key network infrastructure.**

5.1) Removing bottlenecks in key transport network: Drenthe has leased confused and least populated region an overview. It is well connected by roadways. The train and bus services are however are not optimal.