Innovation: concept, measurability, policy. The case of Belgium

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Abstract

Innovation is a broad concept and it is not in contradiction with tradition. Any entrepreneur, even when working in a traditional sector or a businesses with strong traditions such as a family business can be innovative.

Innovation is not only pushed by the entrepreneur but is increasingly market pulled. Through innovation the entrepreneur wants to influence his market structure or to develop new markets.

It is not easy to measure innovation. R&D expenditures and internationalization are relevant. R&D is highly concentrated in a limited number of enterprises. Businesses operate in international markets while policy makers focus on a territory. Very often the effect of a policy is felt beyond the territory of the government. This is especially the case in a small open economy such as Belgium. Within a large area such as the European Economic area there is much Interdependence and many spillovers.

The European Commission must allow a differentiated approach of the innovation policy by the countries and the regions and at the same time watch over the fairness of the competition.

1. Theoretical considerations. Innovation and economic theory

Innovation is not confined to the area of entrepreneurship. Also other agents such as government agencies or non profit institutions can 'innovate' but in this paper we limit the discussion to innovation and entrepreneurship, operating in a market environment.

The link between entrepreneurship and innovation has been established strongly since Joseph Schumpeter. Since then innovation is considered as an essential characteristic of entrepreneurship. The link is emphasized by any textbook on entrepreneurship, even introductory ones, such as for example Zimmerer and Scarborough in its fifth edition(2008): "Entrepreneurs also create innovations to solve problems they observe, often problems they face themselves" (p. 44).

The entrepreneur 'innovates' but the entrepreneur has to do this also in a very 'organized' way because the innovation has to be 'implemented' into something that can be sold in the market such as a new product or an existing product at a lower cost. Here lies the distinction between innovation and creativity: "Creativity is the ability to develop new ideas and to discover new ways of looking at problems and opportunities" while "Innovation is the ability to apply creative solutions to those problems and opportunities to enhance or to enrich people's lives" (ibid. p. 43).

The entrepreneur is a very 'active' economic agent. He (or she or the entrepreneurial team) is creative but also runs the business as an organization and has to sell the product in a competitive market. "In short, entrepreneurs succeed by *thinking and doing* new things or old things in new ways. Simply having a great new idea is not enough; transforming the idea into a tangible product, service, or business venture is the essential next step" (ibid. p. 43).

In conventional microeconomic analysis there is the theory of the firm. Following this theory the individual firm is a profit maximizing agent, so the question arises: to which degree is the pursuit of higher profits the main motivation (or at least an important motivation) behind the innovation drive of the individual entrepreneur. Must innovation contribute to higher profits?

Following introductory microeconomics, the economic drive behind innovation simply is to enjoy a (temporary) monopoly rent. We can read this in an introductory textbook of economics such as for example John Sloman: "The promise of supernormal profits, protected perhaps by patents, may encourage the development of new (monopoly) industries producing new products. It is this chance of making monopoly profits that encourages many people to take the risks of going into business".

Through innovation, entrepreneurs not only 'react' to the conditions of their market. They want to develop new markets (for example by developing new products) or they want to dominate their market (or at least a segment) by looking for cost advantages. This was also observed by Schumpeter, as described by Wickham (2006): "Schumpeter saw entrepreneurs not so much as the lubricant that oiled the wheels of an economy, but as self-interested individuals who sought short-term monopolies based on some innovation" (p. 7)

Innovation can be fitted in a strategy of product differentiation. "The innovated product or service must be produced profitably, in addition to being distributed, marketed and defended from the attentions of competitors, by a well-run and well-led organization" (ibid., p. 7)

The definition of innovation often refers to the introduction of a new product or process or to the whole process of taking an invention or set of inventions from the start to the point of commercial introduction. However innovation is not only a matter of product differentiation or product management in general. It refers to all aspects of doing business. Entrepreneurs can be innovative with regard to any aspect of running their business including the production processes, the organization structure, finance management etc. Innovation can be successfully applied in 'new' sectors such as high-tech but as well in very 'traditional' sectors in industry, services and even agriculture. It can be successfully applied in new startups with an informal business culture but also in existing businesses such as family businesses with a tradition of several generations. Small as well as large businesses can be innovative with regard to their product, their technology, their organization or their financial management.

However, in discussions on innovation there is a tendency to associate it with large, technologically advanced firms. This was already a sensitive point for Schumpeter, as can be read in the contribution of C. Freeman in the Palgrave dictionary: "Schumpeter (1928 and 1942) is often known for his emphasis of the advantages of large size and monopoly on innovative performance, whilst traditional theory has continued to stress the advantages of competitive market structures".

2. The measurement of innovation

Innovation is a crucial concept involving creativity, organization and profitability but can it be measured? Is it possible to use operational concepts that allow measurement?

2.1. Microeconomic considerations

The creation of new businesses is necessary for the renewal and modernization of the economy but not sufficient. The new businesses also must be of 'good quality'. But what does that mean? One of the characteristics of this 'good quality' is the degree of innovation. Now the question arises: is it possible to measure the innovation?

It has been tried to measure and to make an international comparison by the Global Entrepreneurship Monitor Report, or the GEM report (Vlerick Leuven Gent Management School 2006).

The authors of the GEM report use a very pragmatic concept of innovation and entrepreneurship: a business idea may be considered as innovative if it is perceived by the market as completely new, if there is no direct competition or if the technology is basically new. The GEM tried to determine the degree of innovation by asking three questions to starting entrepreneurs:

- Do your (potential) customers consider your products or services as 'new' or 'unusual'?
- Are there no other businesses who offer the same products or services to your (potential) customers?
- Were the technologies or procedures for your product not yet available one year ago?

By these questions a ‘degree’ of innovation of starting entrepreneurs was determined, following the number of positive responses:

0 No innovation
1 Low innovation
2 High innovation
3 Maximum innovation

The questions have been submitted to a sample of starting Belgian entrepreneurs. The results are as follows:

Number of positive responses		Belgium (%)
0	No innovation	50,7
1	Low innovation	26,3
2	High innovation	20,4
3	Maximum innovation	2,6

About half of the starters are not ‘innovative’ at all. Only 2.6 % of the Belgian starters are considered as ‘innovative’. The authors of the GEM report expressed their disappointment with this result, as innovative start-ups are considered to create most value added for the economy.

We can also state it in another way: 49.3 % of the Belgian startups are ‘some way’ involved in innovation. This is more than de European average of 44.3 %.

For an international comparison the GEM authors calculated the ‘TEA Innovation Index’: the percentage of the working population that has started up a new business (or is working on a project) in a category ‘low innovation’, ‘high innovation’ or ‘maximum innovation’.

This index is not only influenced by the degree of involvement in innovation but also by the share of the population which is involved in entrepreneurial activities. In 2006 the index for the EU (16 countries) was 2.22 and for Belgium 1.34. This result shows that Belgium lags behind the EU average: it is at the 14th place (of 16 participating countries).

Following the empirical work of the GEM the Belgian population is ‘less entrepreneurial’ than the European average but those who start a business are “more innovative” than the European average. This implies that there is a high correlation between entrepreneurship and innovation but the two concepts do not coincide completely.

2.2. Macroeconomic considerations

In a macroeconomic approach, the question often is whether innovation is a drive for economic growth?

In this type of research, innovation often is measured by some indicator for R&D investments. In 2008 the Belgian Federal Planning Bureau published an econometric study about the determinants of innovation in a small open economy such as Belgium (Biatour and Kegels 2008). The research covers the period 1987-2005 and 20 sectors of the Belgian private (market) sector. It determines the relationship between multifactor productivity on the one hand and three determinants on the other hand: R&D investment by private businesses, the qualification of the labor force and the diffusion of information and communication technologies (ICT).

The most relevant conclusions for our discussion are:

- Technological differences, measured by differences in multifactor productivity, have an influence on growth. When the difference with the world technological frontier increases, the growth in multifactor productivity will accelerate. Within a large area without economic borders a lag can be compensated in a relatively short delay.
- The use of highly qualified labor increases the productivity of the Belgian businesses.
- Internal R&D (R&D investment in Belgium) has no effect on the growth of multifactor productivity but R&D investments outside Belgium has a positive influence on the productivity of the Belgian manufacturing industry.

The last conclusion also brings the aspect of internationalization to the foreground. Businesses who are located in a small country like Belgium and who invest in R&D do not operate in a regional or national market but on a European or larger scale.

3. Policy and policy evaluation

The degree of innovation is monitored by policy makers. A high degree of innovation is considered to make the economy more 'competitive'. Innovation will not only support the development of new products or increase the productivity of labor and capital, but also bring more economic growth, employment, a better balance of payments, improve the labor conditions etc. There is clearly a link between microeconomic issues such as entrepreneurial startups and macroeconomic performance.

3.1. Innovation and competitiveness

In 2006 the Belgian Central Economic Council (a consultative and advisory body composed of the organizations representing employers and employees at the national level) made a diagnosis of the Belgian Innovation System, in cooperation with representatives of universities and organizations (Vandecandelaere 2006). In 2003 69,7 % of the R&D expenditures have been made by the private business sector. The average for the EU (15 Member countries) was 64,2 %. Public expenditures (expenditures by the governments) were only 6,8 %, while the EU average was 12,8 %.

The survey also showed that within the private sector, the concentration was very high: in 2003 the 10 most active firms in R&D generated 32,82 % of the total of R&D expenditures in Belgium. A reduction of the R&D efforts by one of these businesses immediately could have a big effect. This is not typical for

Belgium, it happens in most small countries. We also see the effect of internationalization again. In Belgium, 70 % of the R&D expenditures happen in foreign owned enterprises.

Also in 2006 the Central Economic Council commissioned a study on the competitiveness of the Belgian economy and its effects on job creation (De Backer and Sleuwaegen 2006). Over the period 1998-2003 the number of jobs in the Belgian industry (manufacturing industry, construction and energy production) decreased with 24.696 units. This net decrease was the result of four movements: the entry of new businesses brought about a job creation of 58.775 units while the growth of existing businesses generated 218.128 new jobs. On the other hand 101.702 jobs went lost because existing businesses left the market while 199.897 jobs went lost because existing businesses downsized.

The effects of the exit and downsizing were most intensely felt for businesses with traditional activities and low technological content, which illustrates the effect of 'creative destruction' on a macro level..

Over the same period and in the services sector there was a net increase of 208.156 jobs. The entry of new businesses generated a job creation of 118.932 units and the growth of existing businesses brought the creation of 566.590 units. The exit of existing businesses destroyed 188.722 jobs and the downsizing of businesses destroyed 288.644 units.

The Central Economic Council also examined the effects of innovation and internationalization on the dynamics of the labor market. The degree of innovation is measured by R&D investment. R&D investment is highly concentrated in the industrial sector (about 90 %).

During the period 1998-2003 jobs have been created in industrial businesses who generated R&D investments while jobs got lost in Belgian businesses which did not invest in R&D on a permanent basis. Most jobs were lost in sectors and activities with low technological intensity such as textile and clothing or food and beverages.

Investment in R&D is not only relevant for employment and job creation but also for the generation of value added. Over the period 1998-2003 the value added increased 11,1 % for the R&D investors and only 5,1 % for the non R&D investors.

Also internationalization has had its effect. On the one hand there is not only a difference between Belgian and foreign firms. On the other hand there also is a difference within the group of Belgian businesses following the involvement of the firm in international activities. In the industrial sector the loss of jobs was much more intensive in internationally active businesses than in locally active businesses, in the services sector the job creation was more intensive in the latter group.

If we bring together the effects of the parameter 'R&D' on the one hand and the parameter 'internationalization' on the other hand we observe that the loss of jobs specifically happens in businesses who are not active in R&D. The employment increases for businesses who are internationally active and who invest permanently in R&D. The same holds in the services sector.

The study of the Central Economic Council concludes that internationalization and R&D investment are no substitutes with regard to the creation of employment and value added but rather complementary productive processes.

3.2. Evaluation of the innovation policy

Because innovation is crucial for the development of enterprises and the development of the economy as a whole, governments look for ways to support innovation and innovation-minded entrepreneurs. The need for government support is motivated by the positive external effects generated by innovation. There are two basic categories of policy instruments: direct financial support (subsidy, contract research, …) and tax incentives.

In 2006 the Belgian Federal Planning Bureau made a comparison between public expenditures on innovation in Belgium, Sweden and Finland (Biatour and Kegels and Vandecandelaere 2006).

	Finland	Sweden	Belgium
Public R&D expenditures Mio Euros	1287	2496	1219
As percentage of R&D expenditures	25.7	23.5	23.5
As percentage of GDP	1.03	0.95	0.58
Public expenditures R&D in higher education	0.55	0.62	0.29

In Finland, 2 ministries are involved, in Belgium and Sweden 9. Policy is sector-oriented in the two Scandinavian countries while in Belgium for institutional reasons the first orientation is regional. The Regions can (and do) follow a sector-oriented policy.

In 2007 an expert commission made a screening of the innovation policy instruments used by the Flemish regional government (Soete 2007). Following this commission the policy instruments have to take account of changes in the innovation process itself. They quote the following recent developments:

- Businesses not only create added value by creating a technologically better product or service (technology push) but they do so increasingly by meeting a want or solving a problem (market pull). Due to new technologies such as ICT, businesses maintain a better contact with their customers and have better knowledge of their wants. The product increasingly becomes designed for the individual customer.
- Businesses which offer technologically advanced products master the whole trajectory of the production, from product development to marketing. Some parts of the production process may be outsourced but the business masters the intellectual property. Innovation increasingly is a matter of integration.
- Businesses innovate within the framework of open networks. The agenda of the R&D network is coordinated and shared with other parties such as end users, competitors and research institutes. Innovation needs knowledge coming from diverse sources and disciplines.

3.3. Government intervention within the European Economic Area

Businesses operate in a market within an open space such as the European Economic Area. When a national or regional government wants to design a policy to support entrepreneurship in general of innovation in particular, it has to focus on the businesses which are active on its territory.

This is a very important case for EU policy. On the one hand there is an argument in support of positive government intervention, on the other hand the European Commission has to watch carefully the rules of fair competition within the European Economic Area. The following quotations from European policy documents show that it is not easy for the European Commission to find an equilibrium between these considerations.

"The identification of policy areas should be market-driven, in full respect of the need to preserve free and fair competition. Without excluding any areas drom such initiative, there is a clear public interest in helping the emergence of solutions that would provide answers to citizens concerns. These would, in particular, be areas where public authorities play a critical role to eliminate existing barriers to market take-up of new products. However, this should not be at the expense of supporting innovation in more traditional sectors" (2006, p. 12)

Innovation is market driven and not only pushed by the firms. This has been recognized by the EU: its policy should be devoted to support 'innovation management' and to develop the promotion of markets. "'Innovation management' is a prerequisite for innovation to flourish in firms. Many enterprises, especially SMEs, encounter difficulties in planning, implementing and marketing innovative products and in innovating in their production processes. Innovation cannot work without taking people into account". "Enterprises of all sizes should be more flexible in responding to rapid changes in demand, adapt to new technologies, such as ICT and e-business, and be able to innovate constantly in order to remain competitive". (2005, p. 17)

The main motivation of the European Commission to accept state aid within the European Economic Area is the possibility of market failures. "Aid for projects covering fundamental and industrial research and experimental development is mainly targeted at the market failure related to positive externalities (knowledge spillovers), including public goods". Other forms of aid are motivated in a similar way (2006, p. 8)

3.4. Feedback between government policy and entrepreneurs

Governments operate on an national or a regional level, possibly within a framework of rules set by international organizations such as the EU or the OECD. These rules are agreed upon to guarantee fair competition.

The problem of the government is to respect these rules and at the same time keep in touch with the entrepreneurs themselves and to evaluate what they really need. These needs can be very different. For entrepreneurs who are active on international markets the need for fair competition will prevail but for in-

stance small enterprises who work predominantly for local and regional markets wand who submit small projects the administrative procedures may be a problem.

In a panel discussion organized by UNIZO, a Flemish Small Business association, a small business owner complained that he had to spend four full working days to fill in his application in order to qualify for an innovation subsidy of 20.000,00 euros: “A bad idea with a good administrative file has more chance to qualify for government support than a good idea with a less good administrative file”

Any policy must be designed in such a way that it pursues the objectives of the government and at the same time is as much as possible compatible with the agenda of the entrepreneur.

4. Conclusion

Innovation is a broad concept. Innovation is not in contradiction with tradition. Any type of entrepreneur, even when working in traditional sectors or in businesses with strong traditions such as family businesses can be innovative with the product, the production process or any aspect of doing business.

Innovation is increasingly market pulled: entrepreneurs meet and want to solve a problem but at the same time the entrepreneur wants to influence his market structure or to develop new markets through his innovation. Policy has to protect intellectual property and to promote competition.

There is a high correlation but not full coincidence between entrepreneurship and innovation.

It is not easy to measure innovation. R&D expenditures and internationalization are relevant. R&D is highly concentrated in a limited number of enterprises. Businesses operate in international markets while policy makers focus on a territory. Very often the effect of a policy is felt beyond the territory of the government. In a large area such as the European Economic area there is much interdependence and many spillovers. This is especially the case in a small open economy operating in this type of market as is illustrated by the case of Belgium.

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