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# JRC Scientific and Technical Reports

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## Fourth European Community Innovation Survey: Strengths and Weaknesses of European Countries

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## ABSTRACT

*This report provides detailed profiles for the EU and some EFTA countries as regards to innovation. The data for analysis are obtained from the recent European Community Innovation Survey, whose results have been released in December 2006. This has been the fourth Community Innovation Survey ( CIS hereby on ) so far, one of the two main instruments together with the European Innovation Scoreboard (EIS) to gather data on innovation indicators and assess national innovation performance. The CIS is designed to obtain information on innovation activities within enterprises, as well as various aspects of the process such as the effects of innovation, sources of information used, costs etc. The CIS-4 survey has been realized in around 30 European countries plus some non-European countries. The structure of the report is as follows: depending on the data availability, for each country a three step analysis is provided: the first part summarizes the general profile of the country on innovation, then the second part focuses on the economic sectors and firm sizes within each country, finally a graphical representation of the general profile of the country is given.*

## INTRODUCTION

This report provides detailed profiles for the EU and some EFTA countries as regards to innovation. The data for analysis are obtained from the recent European Community Innovation Survey, whose results have been released in December 2006. This has been the fourth Community Innovation Survey ( CIS hereby on ) so far, one of the two main instruments together with the European Innovation Scoreboard (EIS) to gather data on innovation indicators and assess national innovation performance. The CIS is designed to obtain information on innovation activities within enterprises, as well as various aspects of the process such as the effects of innovation, sources of information used, costs etc. The CIS-4 survey has been realized in around 30 European countries plus some non-European countries. A total of 101 statistical indicators presented under CIS-4 cover a range of topics related to:

- Product, process, ongoing and abandoned innovation
- Innovation activity and expenditure
- Intramural research and experimental development (R&D)
- Effects of innovation
- Public funding of innovation
- Innovation co-operation
- Sources of information for innovation
- Hampered innovation activity
- Patents and other protection methods
- Other important organisational and marketing innovations in the enterprise

Breakdowns are given at the level of country, type of innovator, size-classes (by number of employees), unit (percentage and absolute value), classification of economic activities (in accordance with NACE Rev. 1) and innovation indicators. This report summarises profiles for 28 of the countries out of 30 that provide rather complete results, including all current EU Member States except Latvia plus Norway and Iceland.

With a group of experts on indicators and innovation, a total of 23 indicators were chosen among 101 on the domains of innovation activity and expenditure, effects of innovation, public funding of innovation, innovation co-operation, patents and other protection methods, and other important

organisational and marketing innovations in the enterprise. The selected indicators, displayed in table 1, are later normalized for further analysis. The analyses have been carried out on the available data, without imputing missing values.

*Table1. List of selected indicators*

<b>Code</b>	<b>Indicator</b>	<b>Unit</b>
<i>inno</i>	Innovation active enterprises	% of total number of enterprises
<i>newfrm_turn</i>	Share of newly introduced product	% of total turnover
<i>newmar_turn</i>	Share of products new to the market	% of total turnover
<i>rexp04</i>	Total innovation expenditures	% of total turnover
<i>erange</i>	Share of enterprises that increased range of goods and services	% of innovative enterprises
<i>emar</i>	Share of enterprises that entered new markets or increased market share as result of innovation	% of innovative enterprises
<i>equa</i>	Share of enterprises that improved quality in goods or services	% of innovative enterprises
<i>eflex</i>	Share of enterprises that improved flexibility of production or service provision	% of innovative enterprises
<i>ecap</i>	Share of enterprises that increased capacity of production or service provision	% of innovative enterprises
<i>elbr</i>	Share of enterprises that reduced labor costs per unit output	% of innovative enterprises
<i>emat</i>	Share of enterprises that reduced materials and energy per unit output	% of innovative enterprises
<i>eeenv</i>	Share of enterprises that reduced environmental impacts or improved health and safety	% of innovative enterprises
<i>ereg</i>	Share of enterprises that met regulation requirements	% of innovative enterprises
<i>funpub</i>	Share of enterprises that received any public funding	% of innovative enterprises
<i>co_all</i>	Share of enterprises that have engaged in any type of innovation cooperation	% of innovative enterprises
<i>propat</i>	Share of enterprises that applied for a patent	% of innovative enterprises
<i>prodsg</i>	Share of enterprises that that registered a trademark	% of innovative enterprises
<i>protm</i>	Share of enterprises that that registered an industrial design	% of innovative enterprises
<i>orginno_yes</i>	Enterprise introduced organizational innovation	% of total number of enterprises
<i>efored_high</i>	Share of enterprises that reduced time to respond to customer or supplier needs	% of total enterprises that introduced organizational innovations
<i>eoqua_high</i>	Share of enterprises that improved quality of goods or services	% of total enterprises that introduced organizational innovations
<i>eored_high</i>	Share of enterprises that reduced costs per unit output	% of total enterprises that introduced organizational innovations
<i>eosat_high</i>	Share of enterprises that improved employee satisfaction and/or reduced rates of employee turnover	% of total enterprises that introduced organizational innovations

The structure of the report is as follows: depending on the data availability, a two to three-page analysis is given for each country. The first part summarizes the general profile of the country on innovation, outlining the major strengths and weaknesses. The second part focuses on the economic sectors and firm sizes within each country. It draws conclusions about the relationship between the size and propensity to innovate and also underlines the most innovative and least innovative branches of economic activity for that specific country in question. The third section is a graphical representation of the general profile of the country, displayed in three figures. The red dot represents the country itself whereas the black ones are all the other countries in the population. It is noteworthy to state that, the aim of showing the values of other countries without naming them is not to rank them but to demonstrate the strong and weak points of the specific country better in the eyes of the reader.



## **Austria (AT)**

### ***Overall Performance***

According to the main results of the 4<sup>th</sup> Community Innovation Survey (CIS 4) in Austria 52% of the enterprises were “innovation active” in the years 2002-2004, in the sense that they introduced new, or significantly improved, goods or services onto the market and/or introduced significantly improved processes in their enterprise and/or performed innovation activities not yet completed by the end of the reference period. In the reporting period, 49 % of the enterprises introduced organizational innovations, i.e. improved significantly their structures or management methods intended to improve the firm’s use of knowledge, the quality of goods and services, or the efficiency of work flows. However, goods and services launched in 2004 constituted only 11% of the total turnover of all enterprises in 2004. Likewise, products new to the market contributed 5 % of the total turnover of all enterprises.

The survey shows that around one third (% 34) of the enterprises with innovation activities were publicly subsidized. On the other hand, only 17% of the enterprises with innovation activity participated in innovation cooperation to accomplish innovation projects actively and together with other institutions.

Improved quality of goods and services was reported by the 37% of the innovative firms as the most important effect of the innovations introduced in the years 2002-2004. For 26% of the innovators, the innovations led to an increase in the range of goods and services and for 23.1% led to more flexibility in the production or service provision. Only 5% of the innovative enterprises considered “reduced materials and energy per unit output” as an effect of high degree. Likewise, “reduced labor cost per unit output” was a rather infrequently quoted effect (7 %).

### ***Analysis by sector and size***

There is a positive relationship observed between the firms’ size and their innovation capacity. Among the large enterprises with 250 and more employees, 82% had product innovation and 77.2 % organizational innovation activities, against 64% and 65.6 % of the medium sized and 48 % and 44.2 % of the small enterprises. The large enterprises have also better means to reach public funds for innovation and more propensities to cooperate compared to small and medium sized enterprises. On this account, more than half of the large enterprises (52 %) received funds, whereas the ration is only 30 % for the small ones. Likewise, 49% of the large enterprises reported that they took part in cooperative agreements throughout the innovation process, while only 14% of the small enterprises did so.

The proportion of enterprises with innovation activities is higher in the manufacturing sector (58%) than in the services sector (48 %), among which the branch computer related activities (NACE 72) has the highest number of innovative firms (82 % ) while the transport sector (NACE I ) has the lowest score among all the branches of economic activity.



Figure 1.1

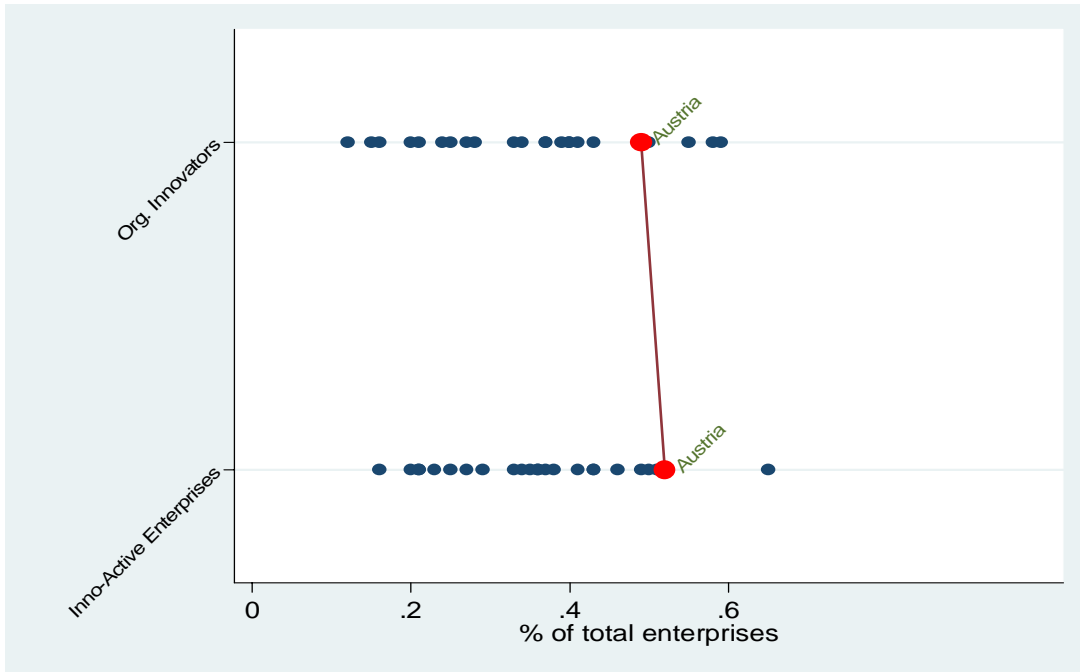


Figure 1.2

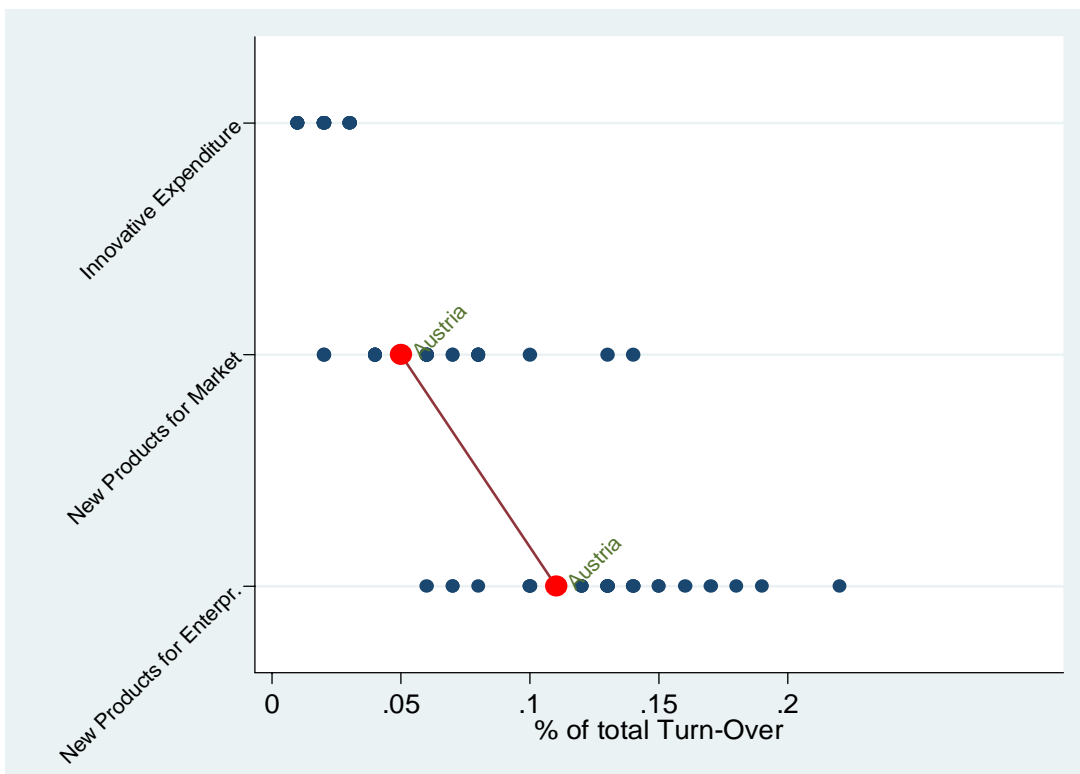
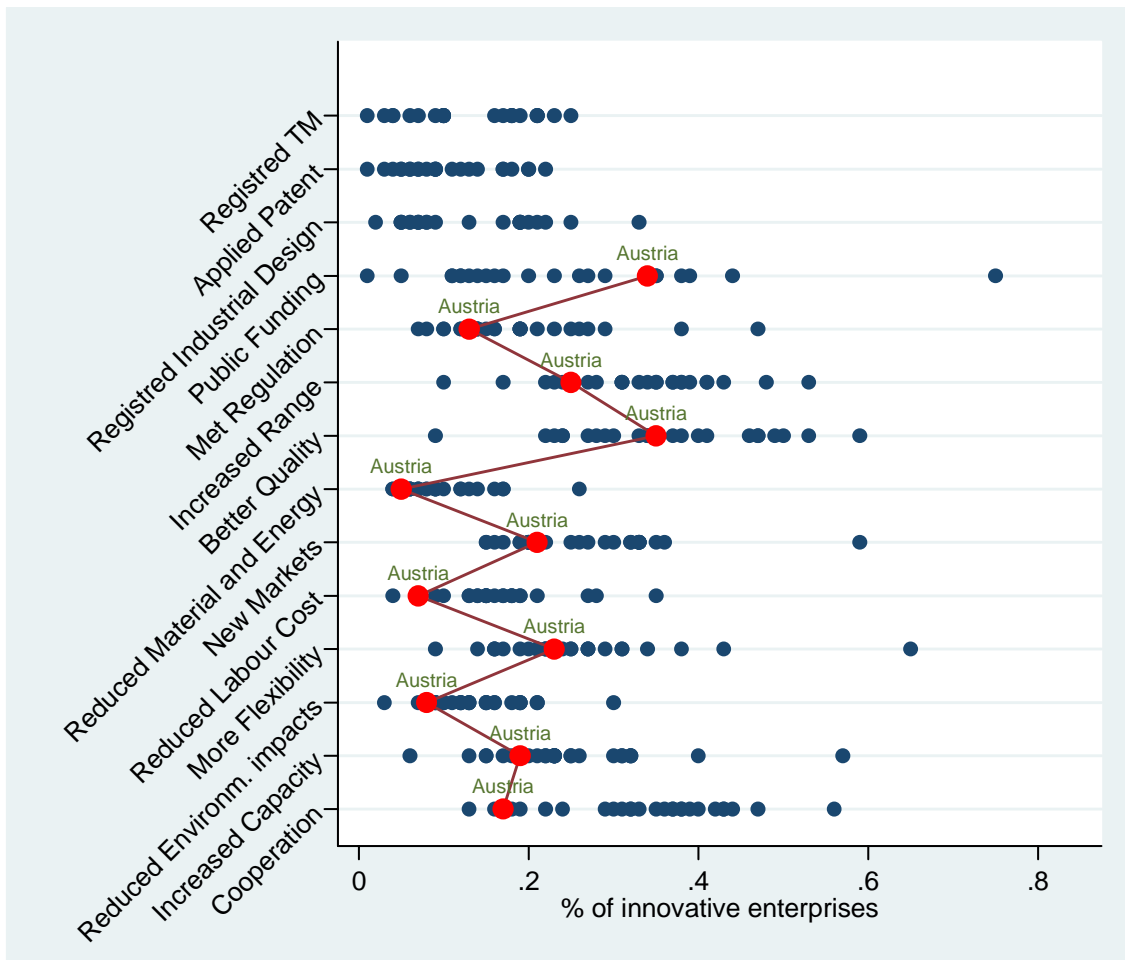


Figure 1.3





## **Belgium (BE)**

### ***Overall Performance***

In Belgium, more than half of the enterprises ( 51 % ) are innovation active in the years 2002-2004. In terms of organizational innovations however, the proportion is relatively lower with a track of 39 % of all the enterprises. The products new-to-firms make up 13% of the total turnover. The proportion decreases to 5 % for the products new-to-the-market. Remarkable strength of the innovative firms in Belgium is that they get very high returns towards innovation. 47 % of all innovative firms reported that they have improved the quality of their goods and services and 35 % that they had their range of goods and services improved. The same holds for organizational innovations, almost half of the firms that have engaged in organizational and marketing innovations (49 %) stated that these activities led to a reduction in their customer response time.

In Belgium, 2 % of the total turnover overall is spent on innovation, which can be interpreted as “above average”, in the light of the Barcelona objective of 2% expenditures in R&D from the business sector by 2010. However, the share of the enterprises that received public funding to innovate is rather low, only 23 %. On the other hand, the enterprises in the country have a better record on innovation cooperation: more than one third (36 %) of the innovative enterprises take part in cooperation agreements throughout the course of innovation.

The state of intellectual property rights is somewhat critical in Belgium, only 11% of all innovative firms have applied for a patent in the period 2002-2004 and 13% of them have registered a trademark for the period of 2002-2004.

### ***Analysis by sector and size***

In Belgium, the firm size has the expected effect on the innovation activity. The large enterprises are more innovative ( 83 % ), spend more resources on innovation ( 3 % of total turnover), can have easier access to public funds for innovation ( 33 % ), participate in innovative cooperation agreements ( 73 % ) and are better in claiming intellectual property rights ( 26 % have applied for a patent and 23 % have registered a trademark in the reporting period ) than the small ones ( 47 %, 2%, 21%, 29%, 9% and 10%, correspondingly).

The proportion of enterprises with innovation activities is higher in the manufacturing sector ( 58% ) than in the services sector (45 %). The branch of computer related activities (NACE 72) has the highest proportion of innovative firms (70%). Unlike most of the other countries, the R& D branch (NACE 73) performs surprisingly lower than the aggregate of manufacturing firms, with 47 %. Still, the laggard sector is the transport with a track of 33 % (NACE I).

Figure 2.1

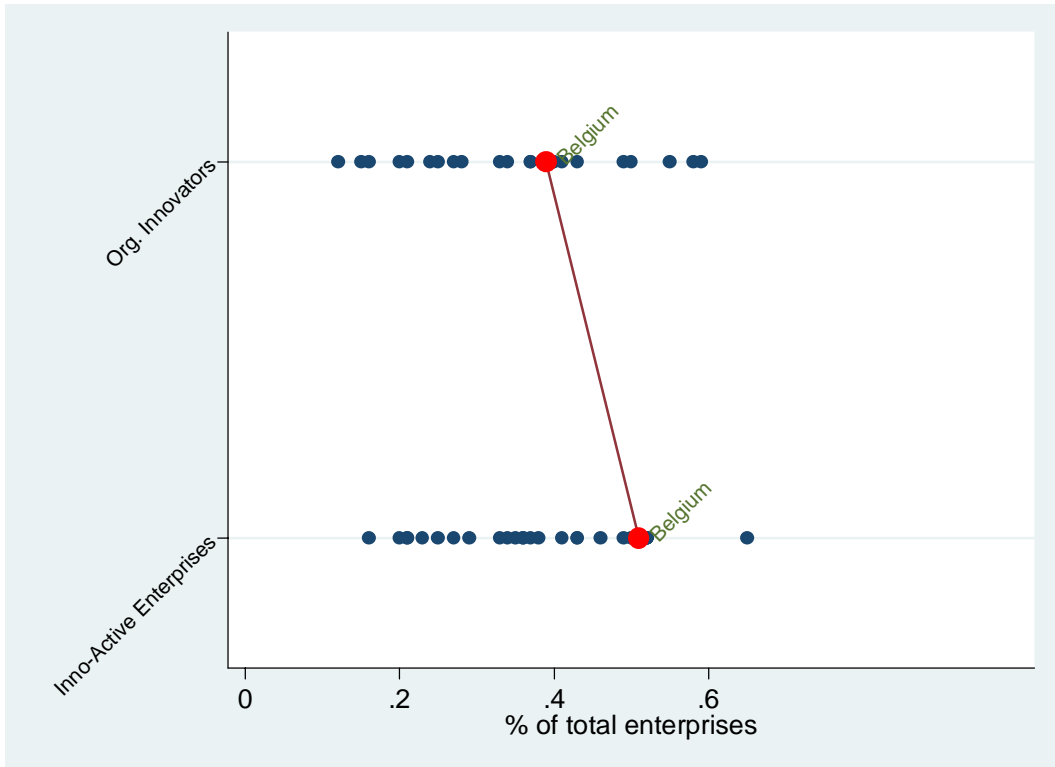


Figure 2.2

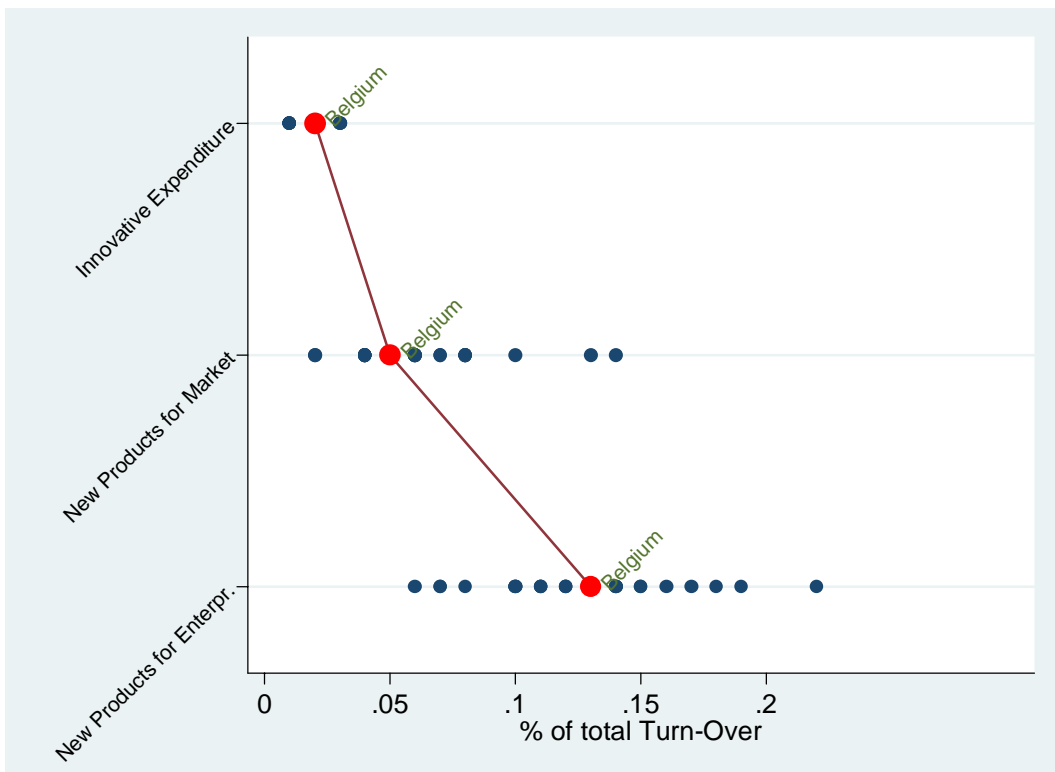
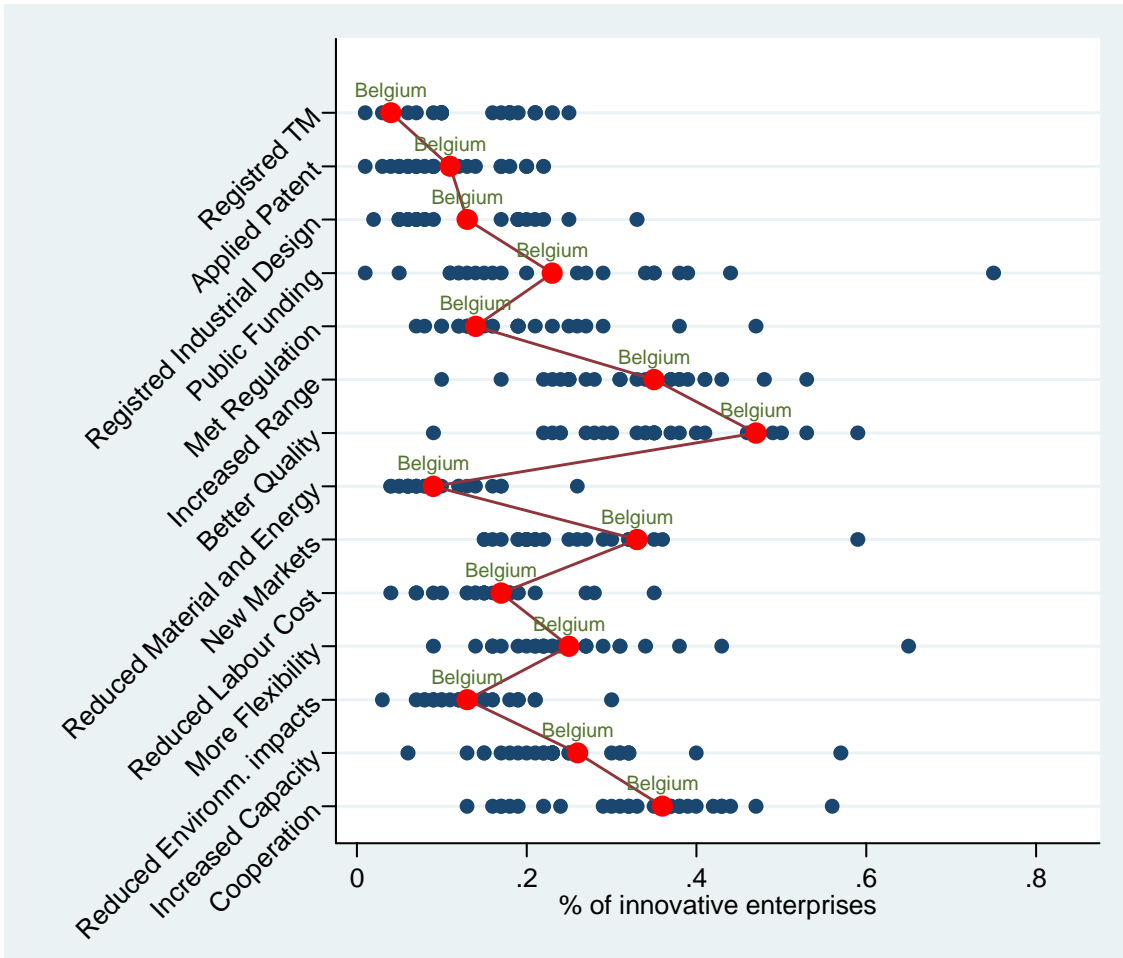


Figure 2.3



## **Bulgaria (BG)**

### ***Overall Performance***

The level of innovation in Bulgaria is quite critical, barely 16 % of the enterprises have been engaging in innovation activities in the years 2002-2004. In the field of organizational innovations, the score of the country is even lower, with a track of only 12% of all enterprises. The products new-to-firm make up 13 % of the total turnover and this number is 5 % for the products new to the market. The enterprises reserve only 1% of their total turnover for innovative activities and a small minority of enterprises ( 5 %) can have access to public funds for innovation. Still, the country does much better (or less bad) in terms of innovation cooperation: 22 % of the innovative firms take part in cooperative agreements with other parties.

The poor performance of the country holds for intellectual property rights as well. Not more than 8 % of all innovative firms have applied for a patent within the time period 2002-2004. The registered trademarks have a rather higher score of 19 %.

The strength of Bulgaria is on the field of output indicators of product and organizational innovation; as a result of the product innovations, 46% of the enterprises stated to have improved the quality of their products and services, 43 % of them increased their range of goods and services. Even less frequently quoted effects, like reducing environmental impacts and improving health and safety, have comparatively high percentages in Bulgaria: 17 % and 21 %. respectively.

### **Analysis by sector and size**

The firm size has the expected effect on innovation activity in Bulgaria as well; large enterprises tend to innovate more (33 %) than the small enterprises (13 %). It is noteworthy for Bulgaria that the gap between small and large enterprises is less than most of the other countries.

The manufacturing sector performs better ( or less bad ) with 18 % of the enterprises being innovative than the service sector ( 13 % ). The best performing branch of economic activity is by far the computer related business ( NACE 72) with a record of 51%, while the worst performers are the enterprises in the transport business ( NACE I ).

Figure 3.1

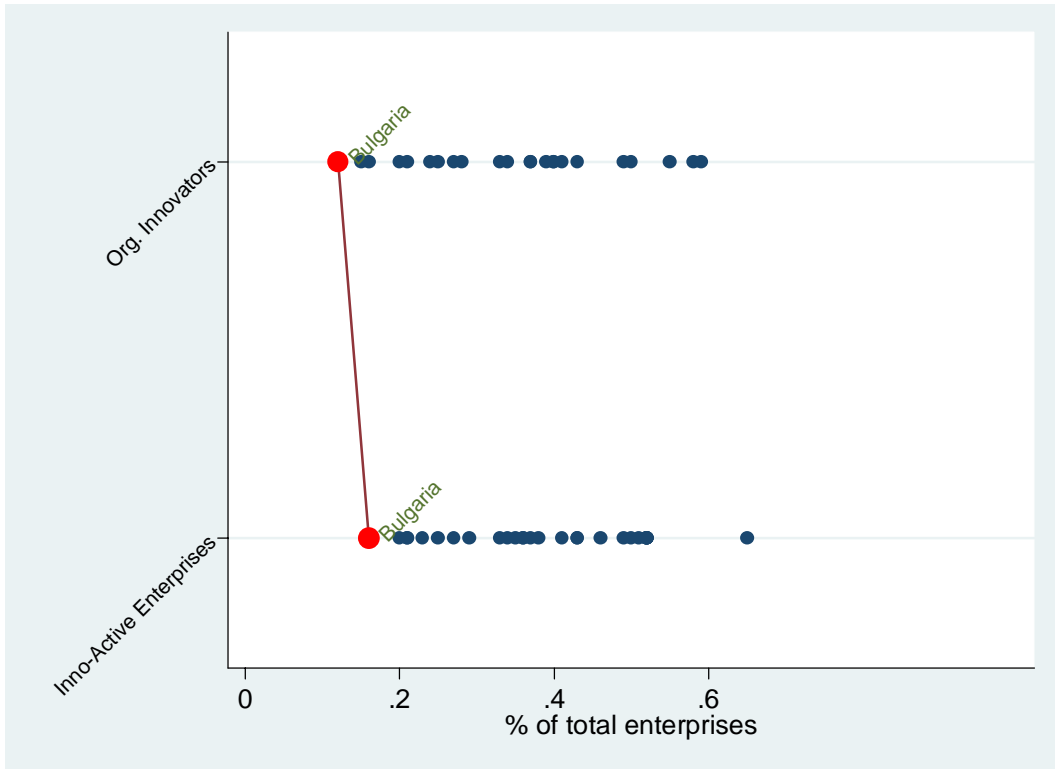


Figure 3.2

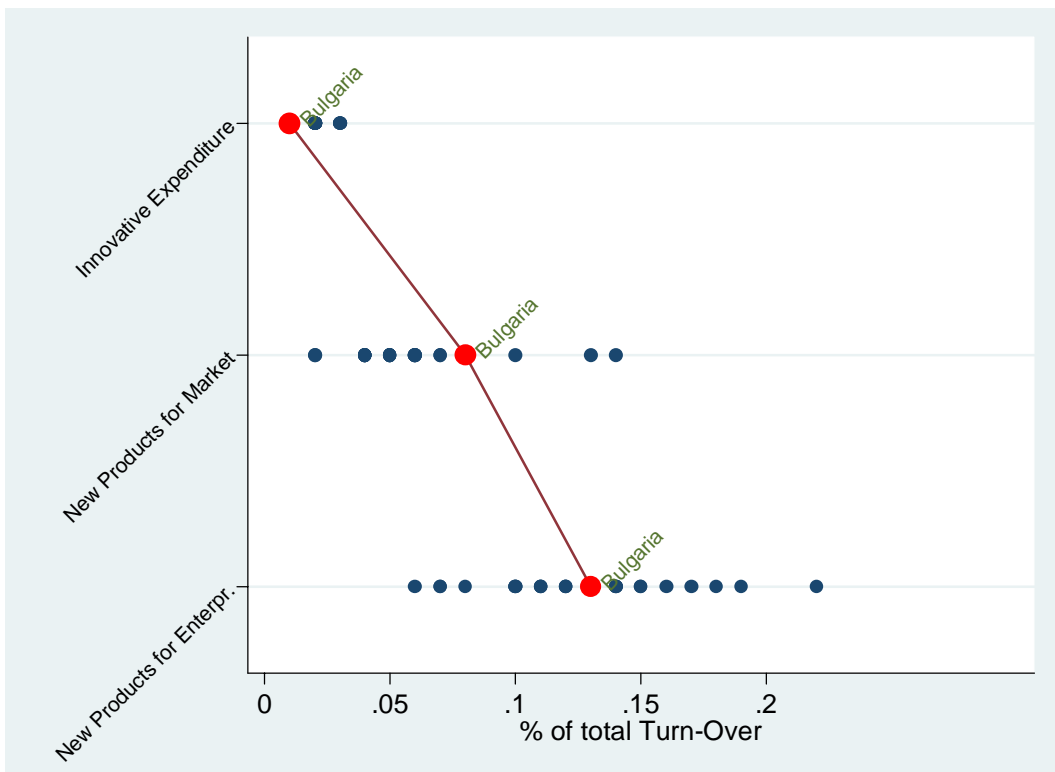
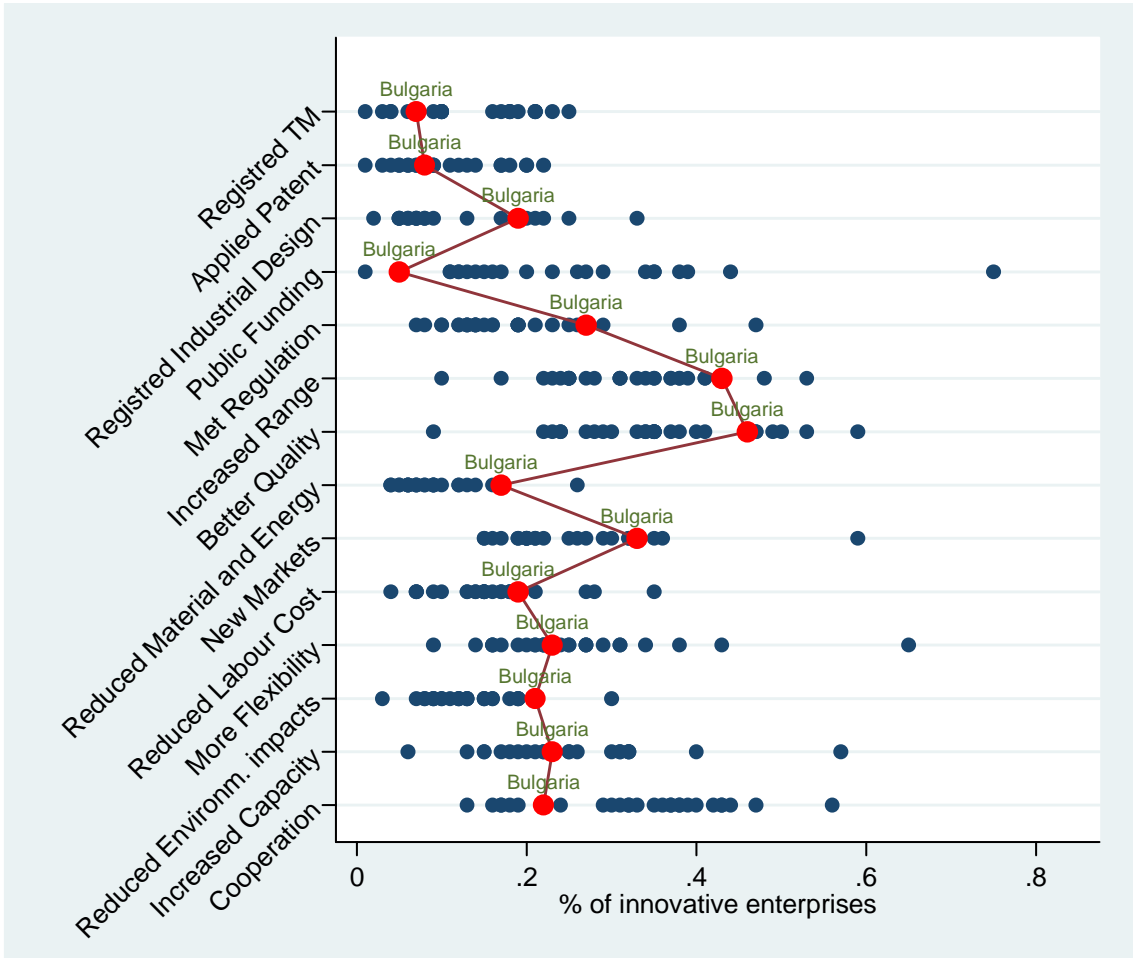




Figure 3.3



## **Cyprus (CY)**

### ***Overall Performance***

In Cyprus, 46 % of total enterprises have become involved in product innovation and 43 % in organizational innovation activities for the years 2002-2004. The enterprises spend 3 % of their turnover on innovation, which constitutes a strong ground; 35% of the enterprises quoted that they have received public funding for innovation in 2004. Likewise, 37% of the innovative enterprises reported to have cooperated with other enterprises and/or institutes throughout the course of their innovation activities.

65% of all innovative enterprises stated that the “improved flexibility of production or service provision” constituted an effect of high degree of the innovations introduced in the years 2002-2004. For the 57 % of the innovators, the innovations led to an “increased capacity of innovation or service production”. In the same way, 51 % of the enterprises that have accomplished organizational innovations claimed to have improved quality of their goods and services. Only 8 % of the innovative enterprises considered “reduced materials and energy per output” as an effect of high degree. “Entering new markets or increasing market share as a result of innovation” was also among the quite infrequently quoted effects in Cyprus (17 %).

The indicators of intellectual property rights are particular weaknesses of the country. Accordingly, only 1% of the innovative enterprises have applied for a patent in 2004 and 5 % have registered trademarks. Another weakness is the low return of innovation: the share of new-to-firm products (only 6 % of total turnover) and the share of new-to-market products (2 % of total turnover).

### ***Analysis by sector and size***

Large firms innovate more (81 % of total) than the small (43 %) and medium-sized (61 %) enterprises. However, enterprises receive public funds rather homogeneously, instead of being dependent on the firm size. The share of small enterprises that have received any kind of public fund for innovation is almost reaching that of large enterprises (around 36 %). On the contrary, the dependency holds for innovation cooperation, with rates 50 % for large enterprises, against 30 % for small enterprises. Large enterprises also spend more resources on innovation (5 % of large enterprises' turnover is accounted as expenditure for innovation), whereas this ration is only 2 % in SMEs.

In Cyprus, the proportion of enterprises with innovation activities is higher in the manufacturing sector ( 53 % ) than in the service sector ( 38 % ). Yet, this latter result might not be accurate due to fact that tourism and hotel business, which make up a high proportion of the country's GDP, were not included in the Community Innovation Survey sample. Still, the best performing sector in terms of innovation intensity is the financial intermediaries ( NACE J), with a track of 77%.

Figure 4.1

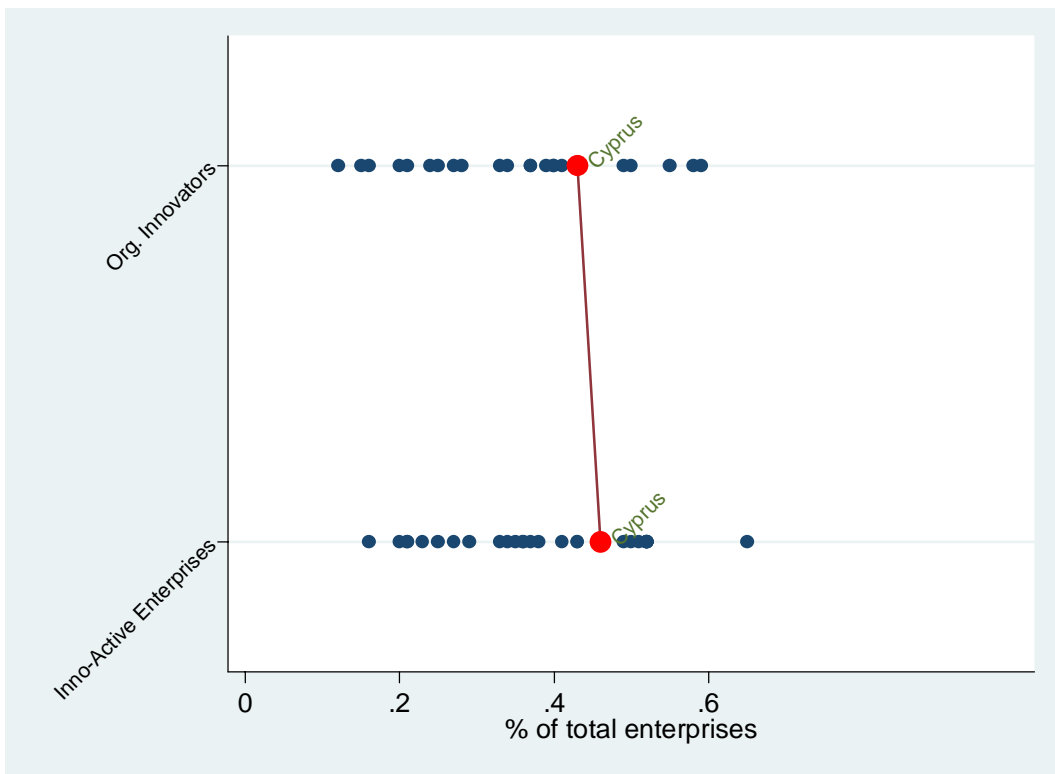


Figure 4.2

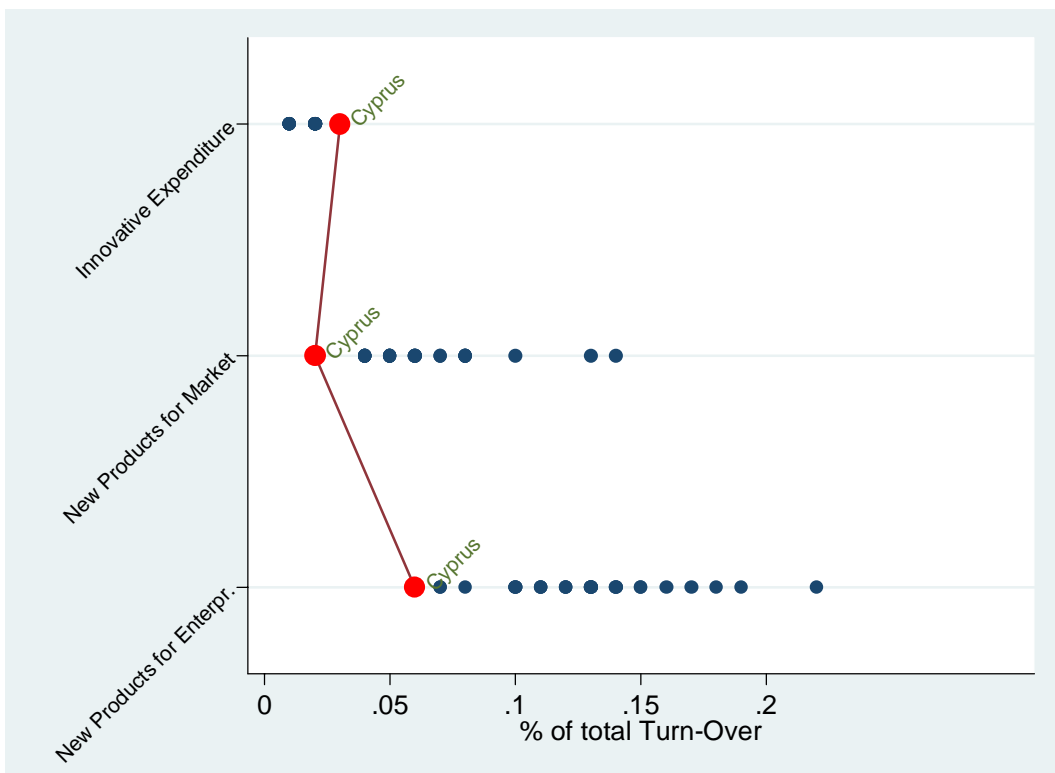
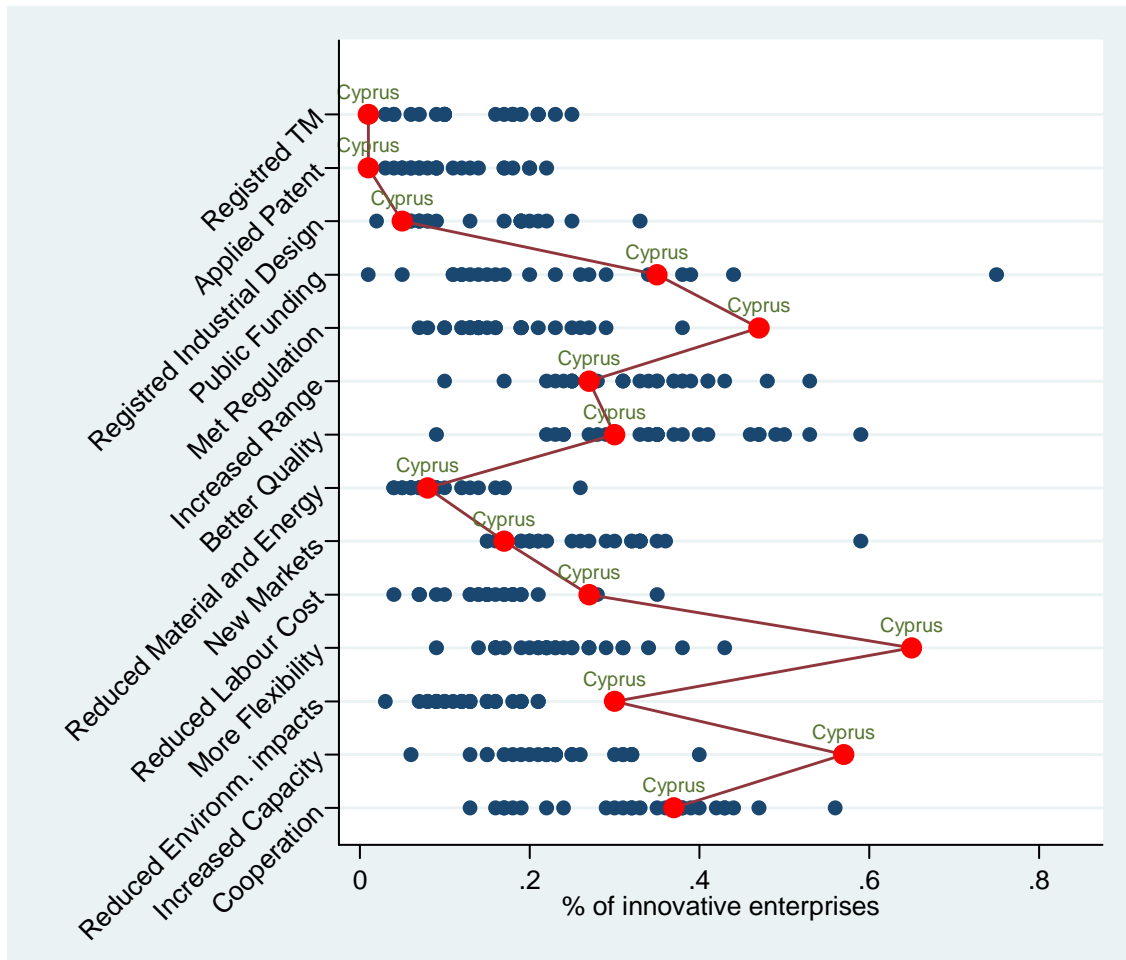


Figure 4.3



## **Czech Republic (CZ)**

### ***Overall Performance***

In Czech Republic more than one third of all enterprises (38 %) reported to be “innovative active” in terms of product and organizational innovations. The enterprises overall spend around 2 % of their total turnover on innovation and they are rather weak in obtaining public funds (barely 16 % of all enterprises with innovation activities between 2002 and 2004 were publicly subsidized). Another deficiency of the enterprises is about intellectual rights: in 2004 a sole 5 % of all the innovative firms applied for a patent and only 8 % have registered a trademark. 38 % of the enterprises with innovation activities participated in innovation co-operation agreements with other institutions.

Among the most frequently quoted effects of product and organizational innovations are increased range of goods and services (41 %), improved quality of goods and services (40 %) and reduction in response time to clients (31 %). “Met regulation requirements” (8 %) and “reduced material and energy per unit output” (14 %) were amongst infrequently quoted effects.

The major strength of the country is on the contribution of new innovations to the total turnover. Product innovations make up 15 % of the total turnover of all enterprises. New-to -market products contributed 8 % to the total turnover of all enterprises.

### ***Analysis by sector and size***

The firm size has the expected effect on the innovation activity. The large enterprises are more innovative (70 %), spend more resources on innovation (3 % of total turnover), can have easier access to public funds for innovation (29 %), participate in innovative cooperation agreements (67 %) and are better in claiming intellectual property rights (14 % have applied for a patent and 15 % have registered a trademark in the reporting period) than the small ones (32 %, 1 %, 12 %, 30%, 3% and 6 %, respectively).

Enterprises in the manufacturing sector are more innovative than those in the services sector (42 % against 34 %). The highest intensity of innovation is observed in the economic activities of R& D (NACE 73) with a record of 68 % and sector of computer related business (NACE 72) with a record of 63 %. The laggard sector is transport (NACE I) with a track of 23 %.

Figure 5.1

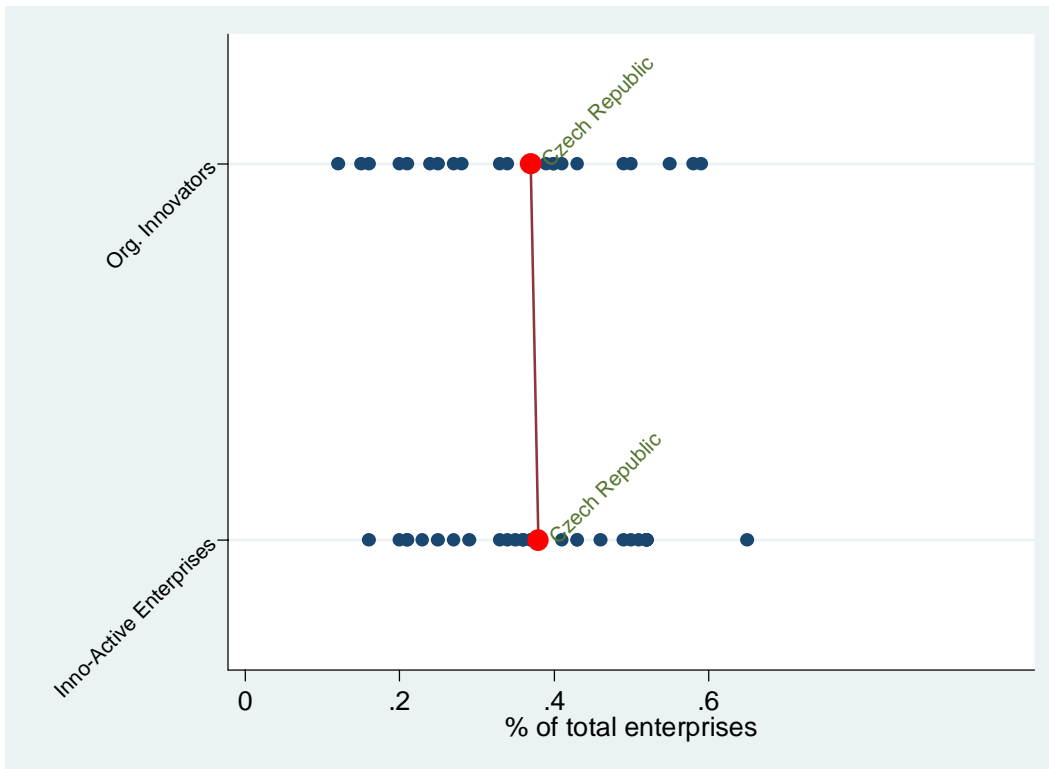


Figure 5.2

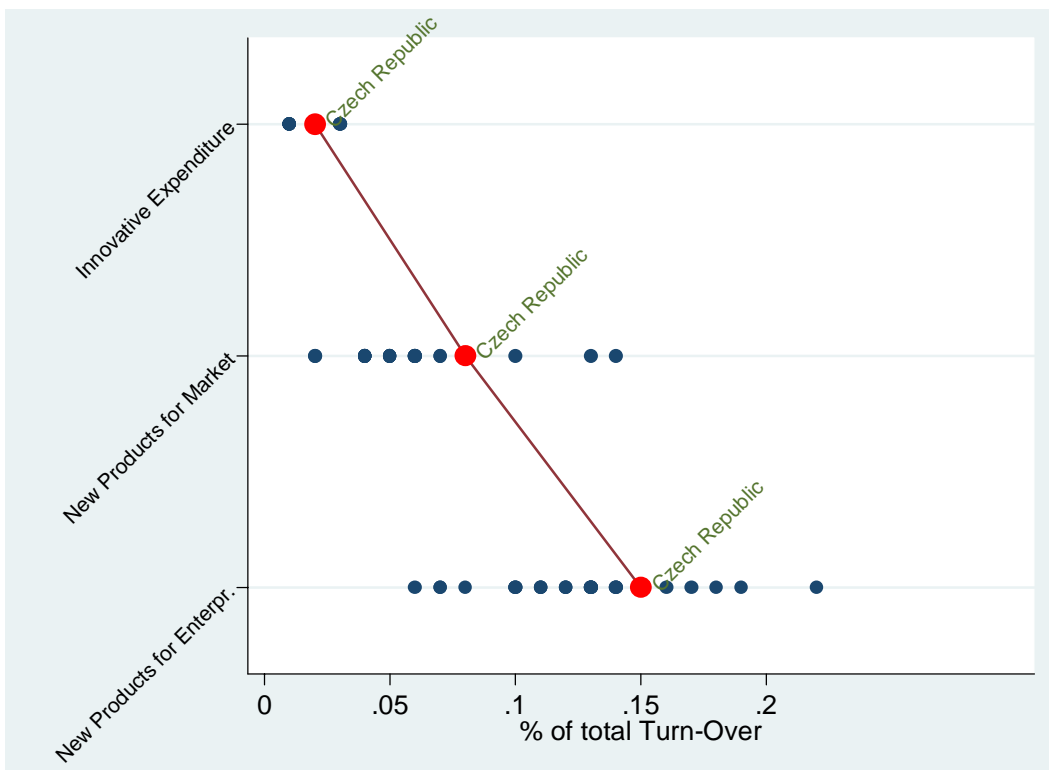
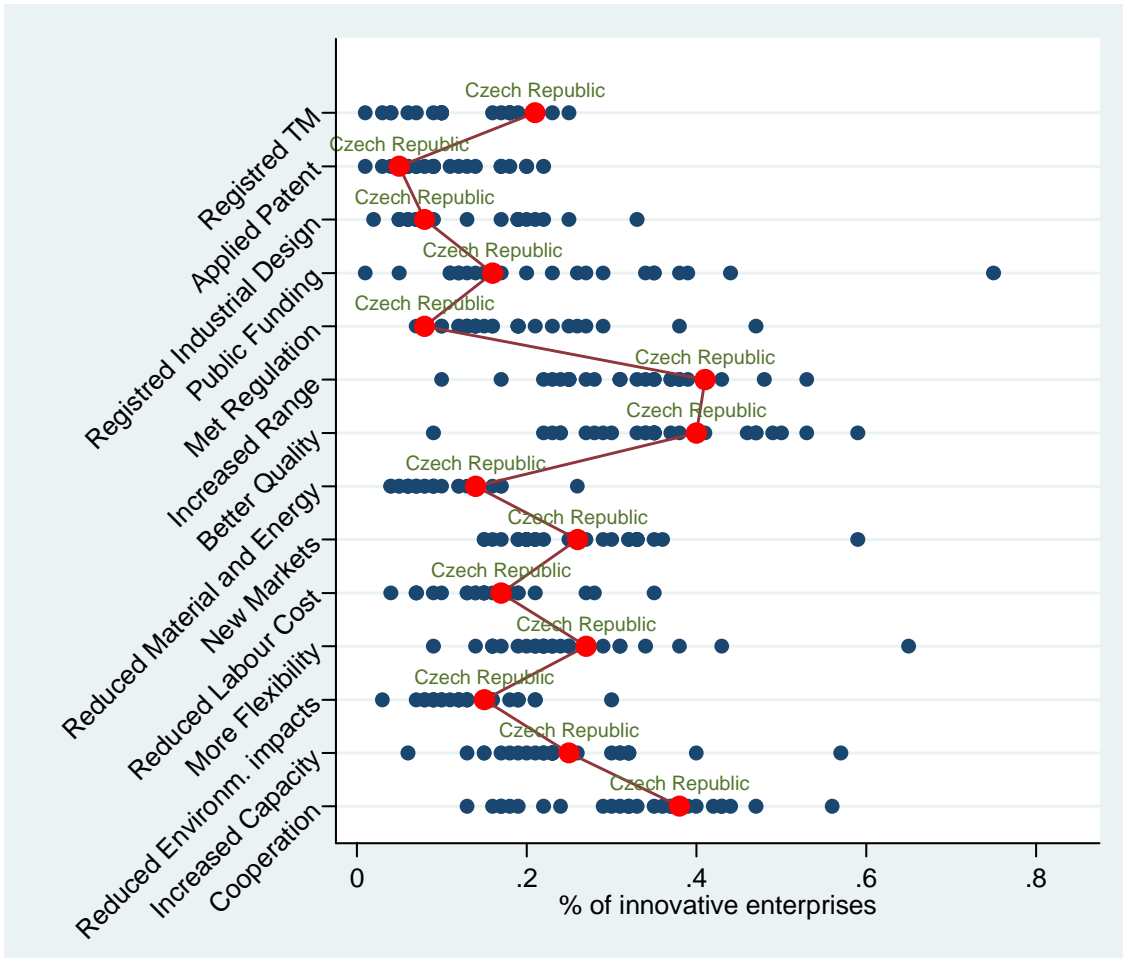


Figure 5.3



## **Germany (DE)**

### ***Overall Performance***

The country performance for innovation is particularly strong for innovation active firms, with a record of 65 %. The same is valid for organizational innovators: more than half of the enterprises (55 %) have accomplished organizational innovations in the period 2002-2004. The share of newly introduced products amounts to 18% of the total turnover for new-to-firm products, and 8 % for new-to-market products. The enterprises spend 3% of their total turnover on innovation and have a very high track of intellectual property rights: accordingly, 20 % of the innovative enterprises have applied for a patent in 2004 and 19 % of them have registered trademarks.

In Germany, the mostly referred effects of product innovations in the reporting period were “increased range of goods and services”, and “improved quality in goods and services” (around 38 % each). Reduced material and energy per unit (9 %), reduced environmental impacts or improved health and safety (10 %), met regulations requirements (10 %) were seldom quoted.

The relative weaknesses for Germany are seen in low participation to innovation cooperation activities and low percentage of firms that have had access to public funds for innovation (only 16 % and 14 % of all innovative firms respectively).

### ***Analysis by sector and size***

As well in Germany the firm size has the expected effect on achieving innovation. In the given period, 89 % of all large enterprises have fulfilled innovation activities while the ratios are 74 % and 60 % for medium sized and small enterprises for the same indicator. It is however noteworthy that, even if there is a gap of 29 % between small and large enterprises, still more than half of the small and medium sized ones are innovative, which constitute a strong point for the country. Large firms have much higher records than small ones in terms of receiving public funds (28 % against 12 %), taking part in innovation cooperation agreements ( 41 % against 12 %) and seeking for the intellectual property rights ( 49 % against 13 % for large innovative firms that have applied for patents).

Manufacturing enterprises overall are more innovative than the services sector firms ( 74 % vis-à-vis 58 % ) but the highest percentage of innovative firms is in the finance sector ( NACE J ) with a record of 81 %. Most of innovative enterprises are found, without surprise, in the branch of computer related business, with a track of 94 % and the least amount in transport ( NACE I), with a track of 46 %.



Figure 6.1

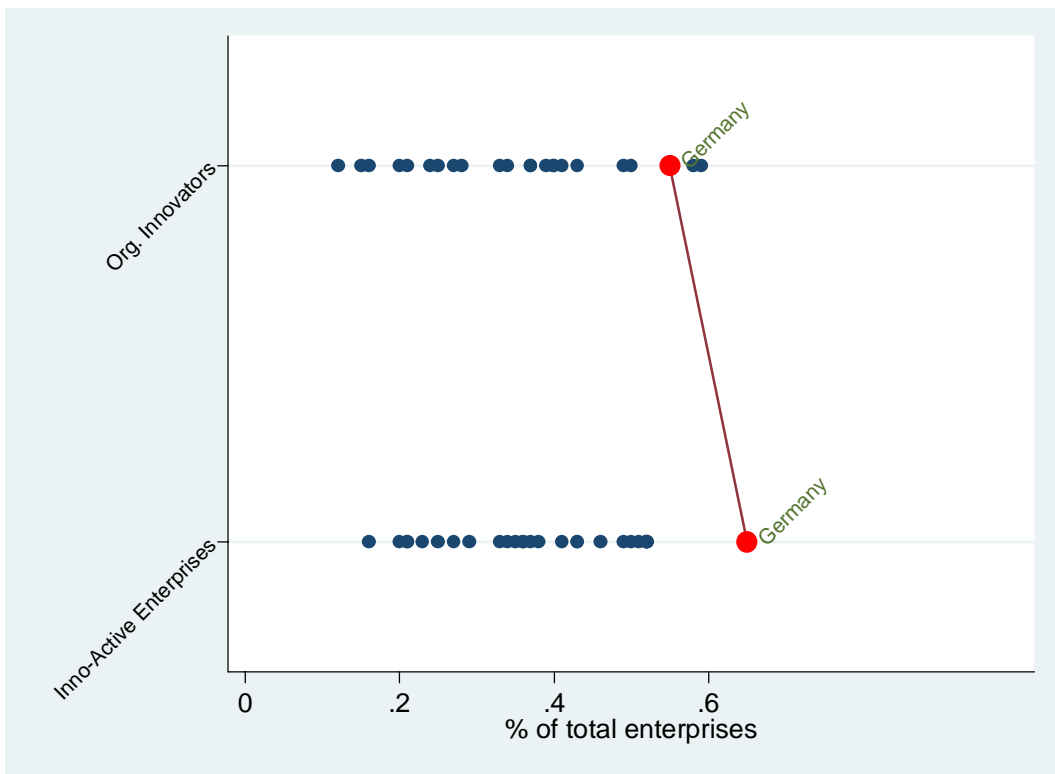


Figure 6.2

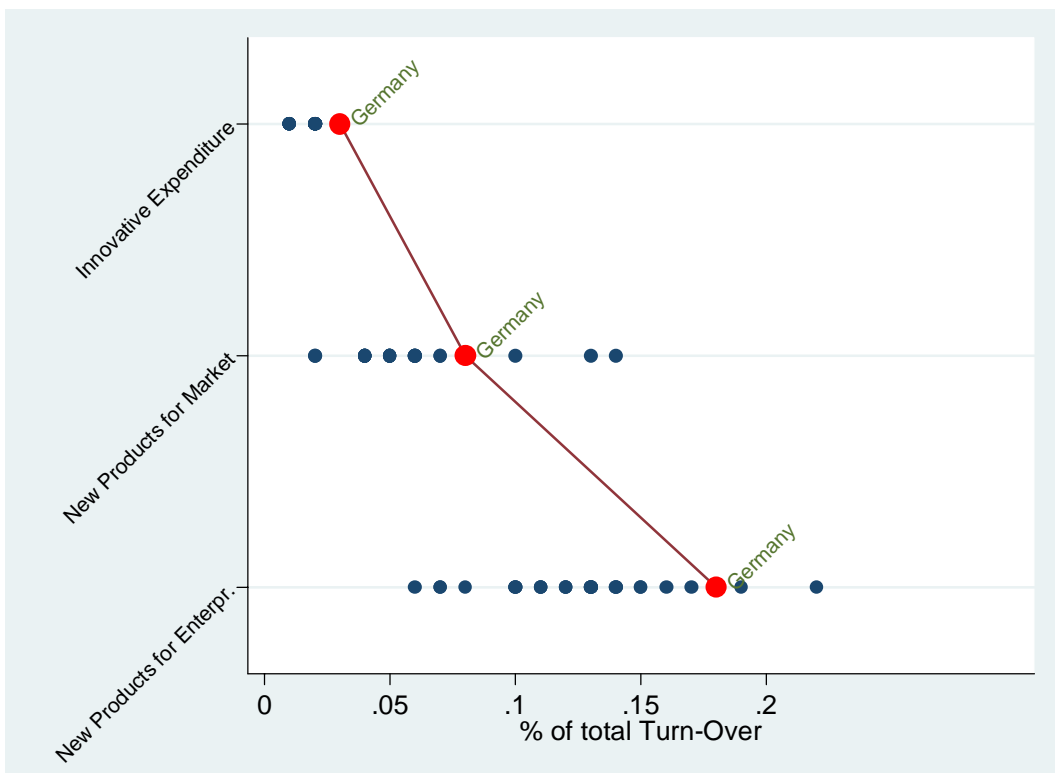
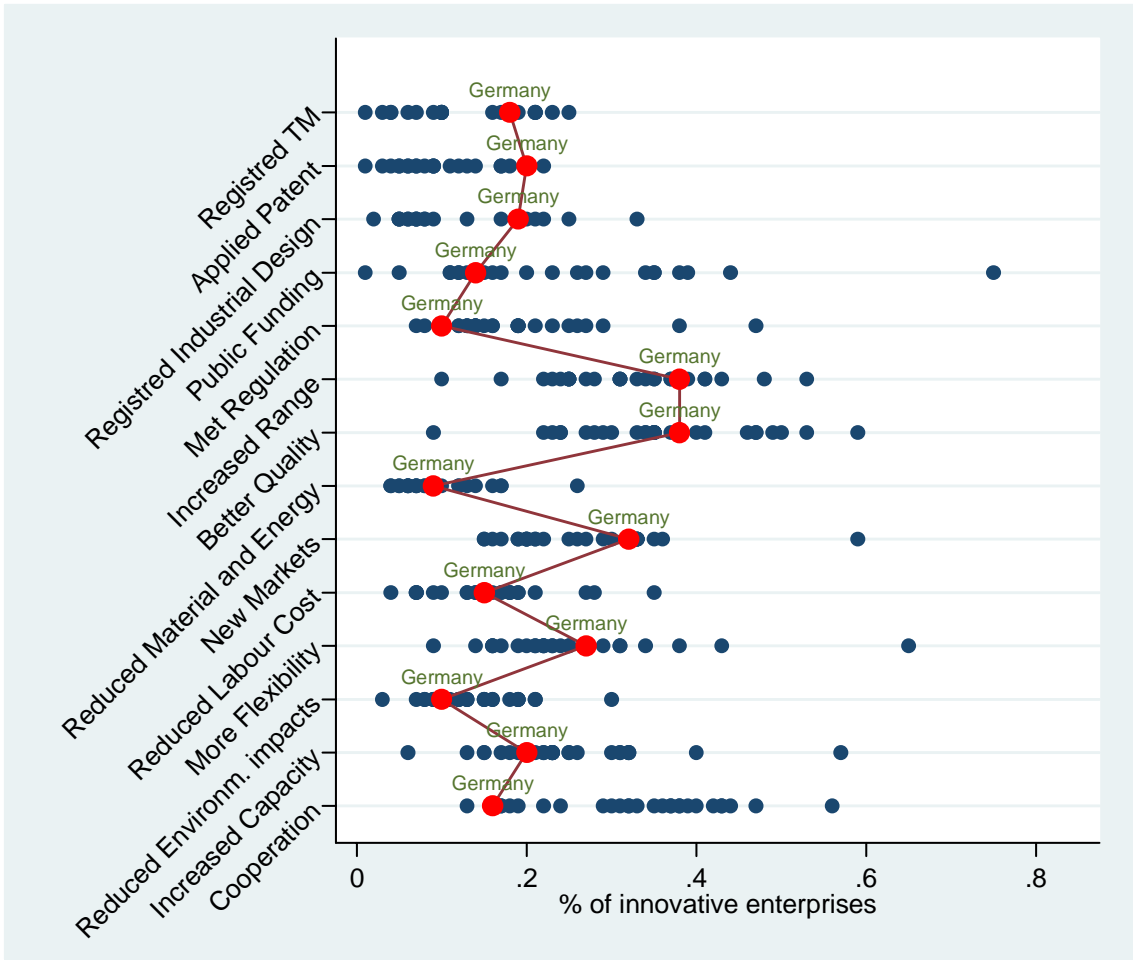


Figure 6.3



## **Denmark (DK)**

### ***Overall Performance***

More than half of the firms in Denmark (around 52 %) have accomplished product and/or organizational innovation in the given period of 2002-2004. The resources spent on innovation make up 2.4 % of the total turnover of the enterprises. The country is strong in cooperating in innovative activities (43 % of the enterprises with innovation activity participated in innovation cooperation with other institutes in the years 2002-2004). The performance of the country is particularly good for intellectual property rights: in 2004, 19.6 % of the enterprises have applied for a patent and 25 % have registered a trademark.

As regards to the effects of production and organizational innovations, improved quality of goods and services ( 27 % ), improved range of products and services ( 25 % ), reduction in time to respond to customer ( 27 % ) are the mostly quoted ones. The least frequently referred effects are “reduced materials and energy per unit output” (7%) and “reduced environmental impacts or improved health and safety” (9 %).

The relative weaknesses of Denmark are visible in the indicators regarding revenues from innovation and public funding for innovation. The share of new-to-firm products was 11% and the share of new-to-market products only 5 % of the total turnover. Likewise, only around 15 % of all the innovation done have been publicly subsidized in the course of 2002-2004.

### ***Analysis by sector and size***

In Denmark, large enterprises have a clearly better performance than small and medium sized ones, with regard to innovation activity, innovation expenditure and share of turnover of new products, publicly subsidized innovation and innovation cooperation. Accordingly, for the given time-span, 78 % of the large enterprises have been innovation active while only 49 % of the small and 59 % of the medium-sized enterprises did so. Large enterprises have reported to spend 3 % of their total turnover on innovation vis-à-vis 2 % for the small and medium sized ones. While 13 % of the innovation done by small enterprises was publicly subsidized, this proportion goes up to 24 % for large enterprises. 69 % of the large innovative enterprises have participated in innovation cooperative agreements against 39 % of the small enterprises.

The manufacturing sector is more innovative than services as an aggregate ( 58 % versus 46 %, respectively ). Among the services, transport business (NACE I) has the highest share for innovation ( 48 %). Computer related business performs best as an economic activity, with a record of 69 %, whereas trade (NACE G51) is at the bottom with a track of 42.5 %.

Figure 7.1

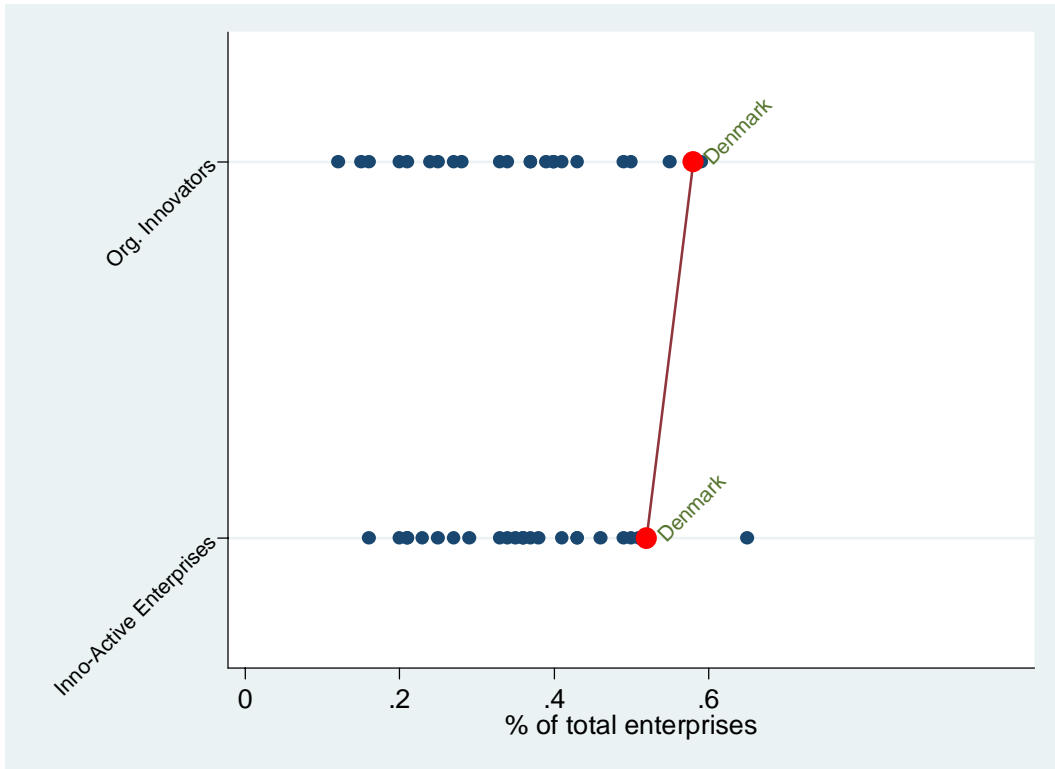


Figure 7.2

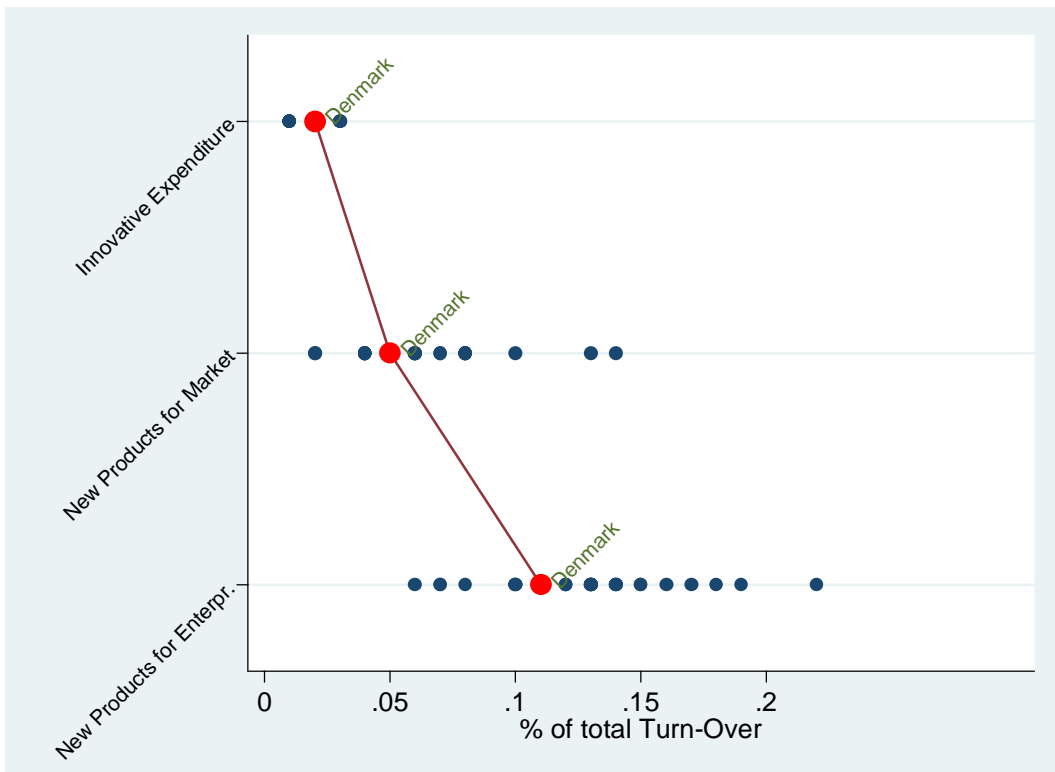
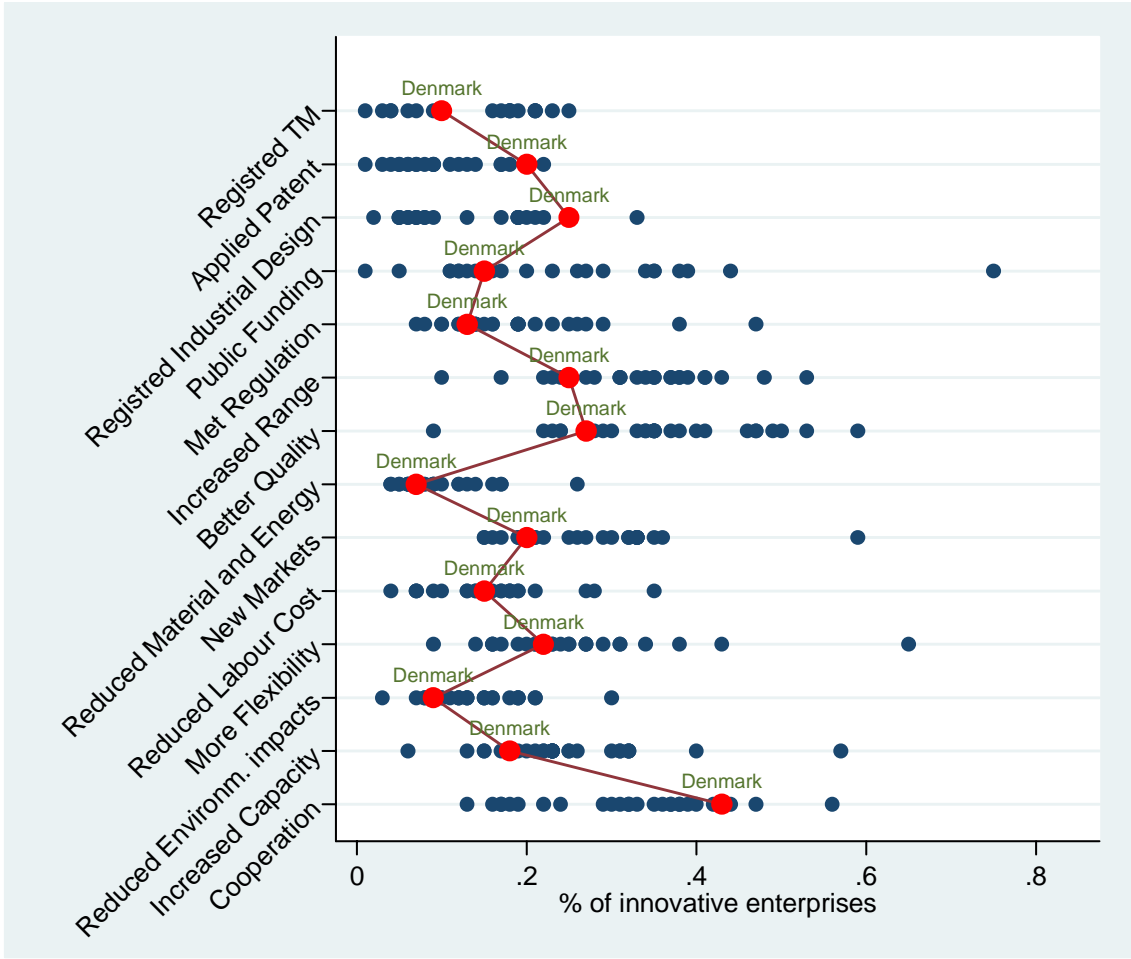


Figure 7.3



## **Estonia (EE)**

### **Overall Performance**

Based on the available data for the country, almost half (49 %) of the enterprises in Estonia have engaged into innovation activities in the period 2002-2004. Likewise, 40.5% of the enterprises reported that they have executed organizational innovations for the given time span. The Estonian enterprises spent 2 % of total turnover on innovation. Around one third (35 %) of all the innovations have been completed cooperatively with other enterprises or institutes.

The notable weaknesses of the country are the indicators of intellectual property (only 6 % of the total innovative enterprises have applied for a patent and 2 % have registered a trademark) and the share of enterprises that received public funding for innovation. Especially the latter one is quite critical in the sense that only a minority of all innovative enterprises (less than 1 % of the total) could receive public subsidies for their innovative activities. The input of products new to the market is also at a relatively low level (4.5 % of the total turnover), while the share of products new to firm in the total turnover has a relatively better track of 12 %.

Concerning the effects of innovations, the country shows a somewhat better picture. 35.4 % of the enterprises reported that they have increased their range of goods and services and 46.5 % have reduced the customer response time as a result of the product and organizational innovations. 33.2 % of the enterprises mentioned that they managed to enter into new markets, which is appropriate for an economy at pace. The least quoted effects were “reduced environmental impacts or improved health and safety” (9 %) and “reduced material and energy per unit output” (12 %).

### **Analysis by sector and size**

In Estonia as well, large enterprises are much more innovative than small and medium sized ones ( 80 %, 45 % and 58 % respectively). The striking difference with the other participant countries seems to be that products new to the small firms overall has almost the same share in the total turnover as the products new to the large and medium-sized enterprises ( around 11 % ).

Another noticeable distinction of Estonia is that the services overall are slightly more innovative than the manufacturing enterprises ( 51 % for services versus 48 % for manufacturing ). The heading sectors are financial intermediaries ( NACE J - 73 % ) followed by trade ( NACE G51 - 63 % ) while the laggard is transport ( NACE I – 33 %).

Figure 8.1

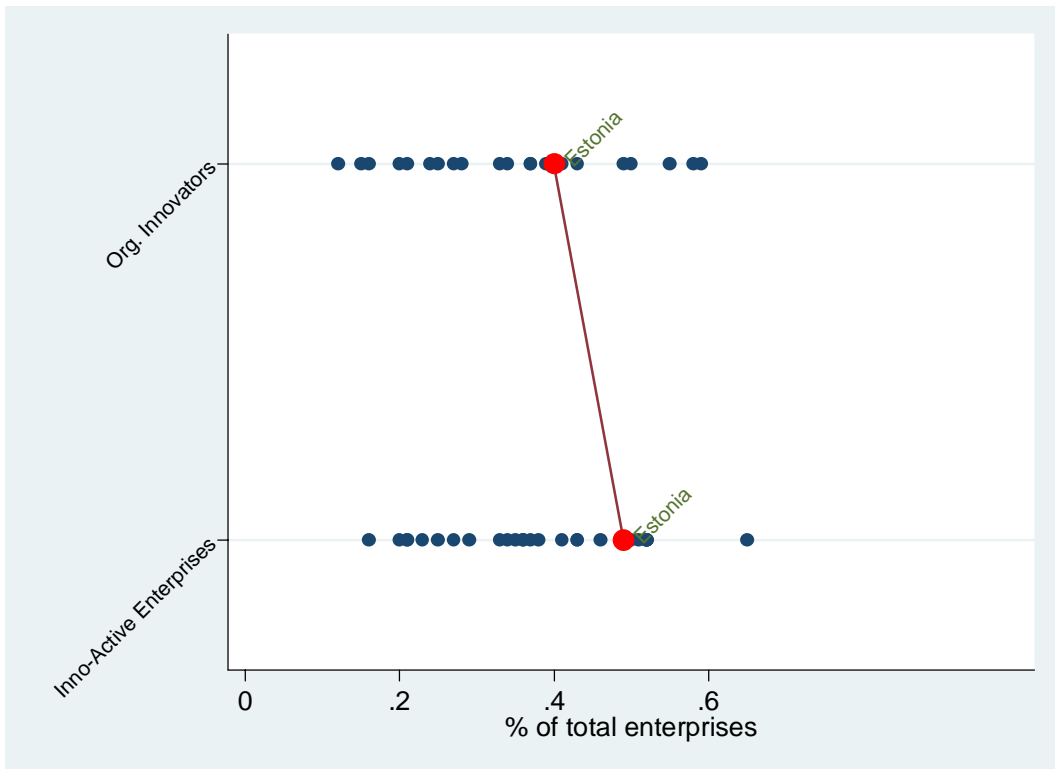


Figure 8.2

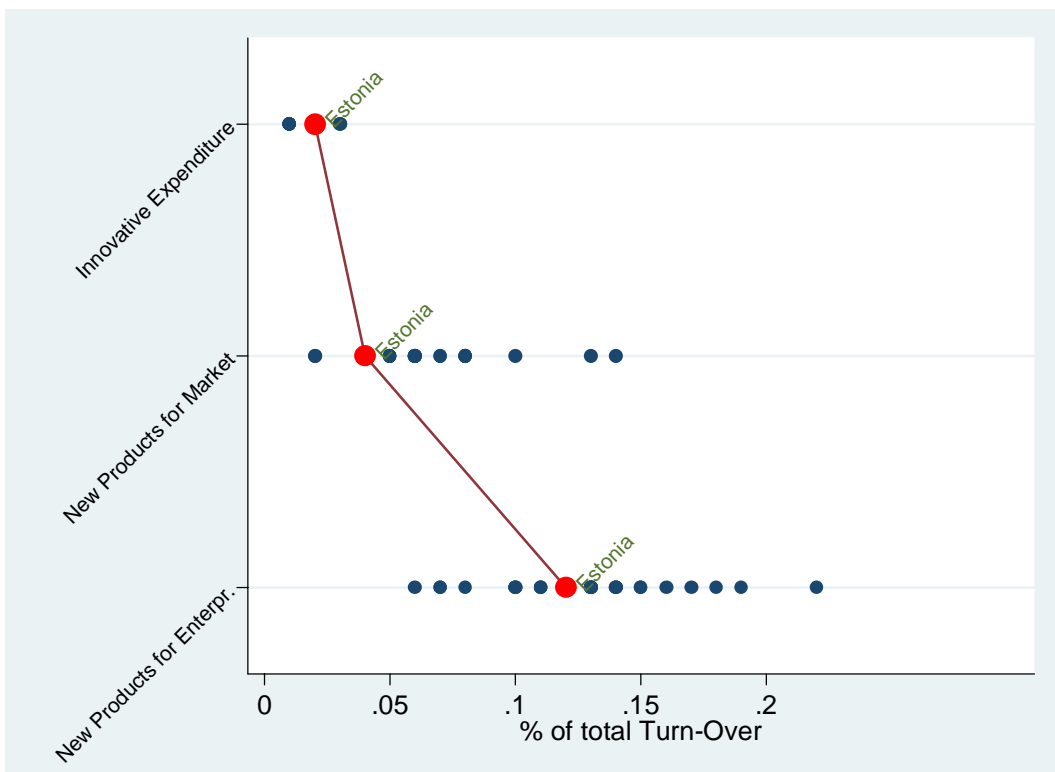
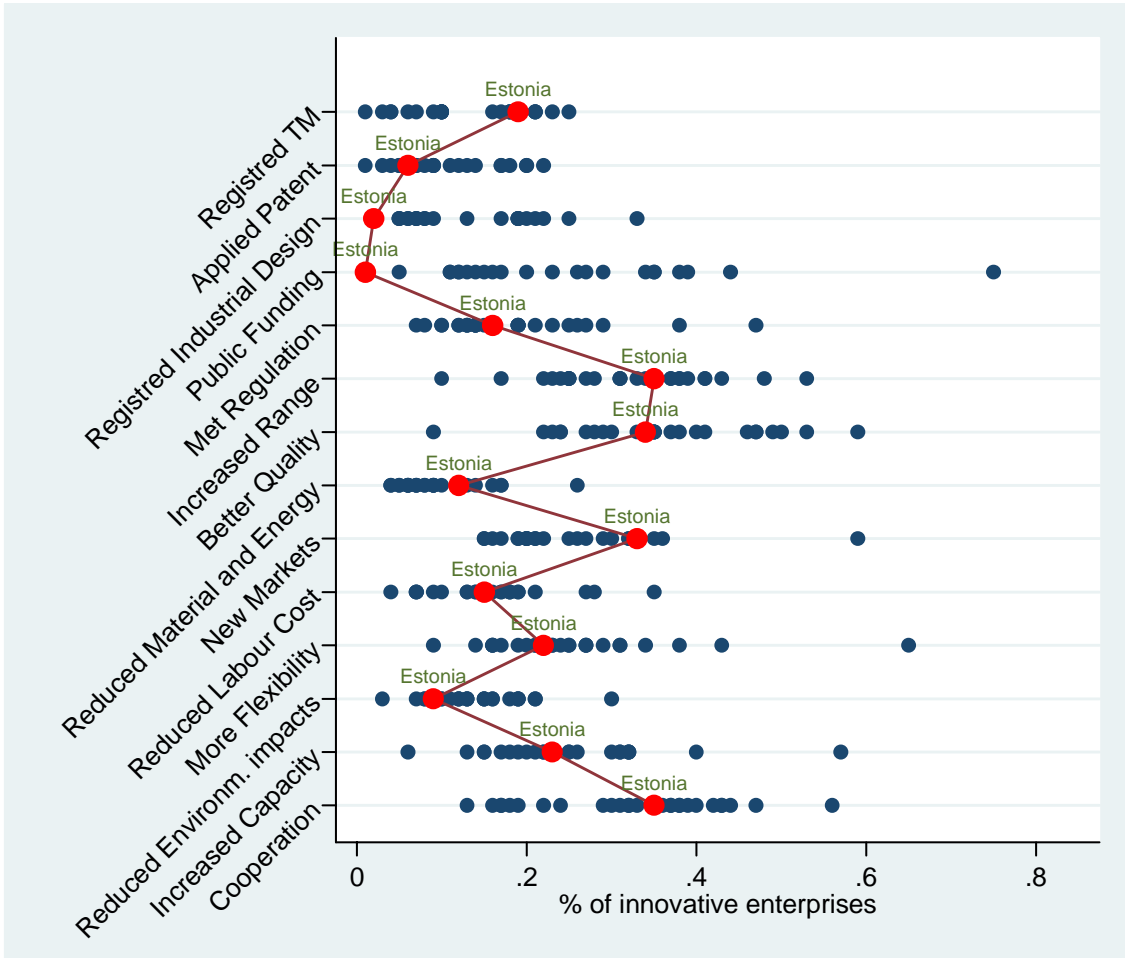


Figure 8.3





## **SPAIN (ES)**

### ***Overall Performance***

Only slightly more than one third of all enterprises ( 35 % ) in Spain have undertaken innovative activities in the period 2002-2004, which might be considered weak if compared to most of the former EU-15 Member States. For organizational innovations, this percentage is even lower (only 28 % of all enterprises). The resources reserved for innovation make up only 1 % of the total turnover of the enterprises. Barely less than one fifth of innovative enterprises ( 18 % ) accomplish innovation via cooperation.

Increased capacity of production or service provision ( 32 % ), improved quality in goods and services ( 35 % ), reduced time to respond the customer or the supplier ( 35 % ) were perceived among the most important effects of product and organizational innovations. The least repeated effect as “highly important” was reduced materials and energy per unit output (only 7 % of innovative enterprises stated so).

The country shows a better performance in the indicators of ability to receive public funds to innovate (26 % of all innovative enterprises) and the share of new products in the total turnover (14 %). Concerning the intellectual property rights, the country has a better record in registered trademarks rather than in patents ( 21 % of total innovative enterprises have registered trademarks, only 12 % of those have applied for patents ).

### ***Analysis by sector and size***

The heterogeneity of the innovation behavior of the enterprises according to their size is significant in the country. Large enterprises do innovate almost double than small enterprises (66 % versus 32 %). The same relationship is observed for the indicators on the access to public funds for innovation (42 % versus 24 %), innovation cooperation (50 % versus 14 %), and share of new products in the total turnover (20 % versus 6 %).

The firms in the manufacturing sector show slightly better performance than those of the services sector overall in terms of intensity of innovation activities (37 % for manufacturing and 32 % for services). Still, in finance sector (NACE J) and computer related business activities (NACE 72), more than half of the firms (50 % and 55 % respectively) initiated or completed innovative activities in the reporting period. The least innovative sector has been transport (NACE I), with a record of 24 %.

Figure 9.1

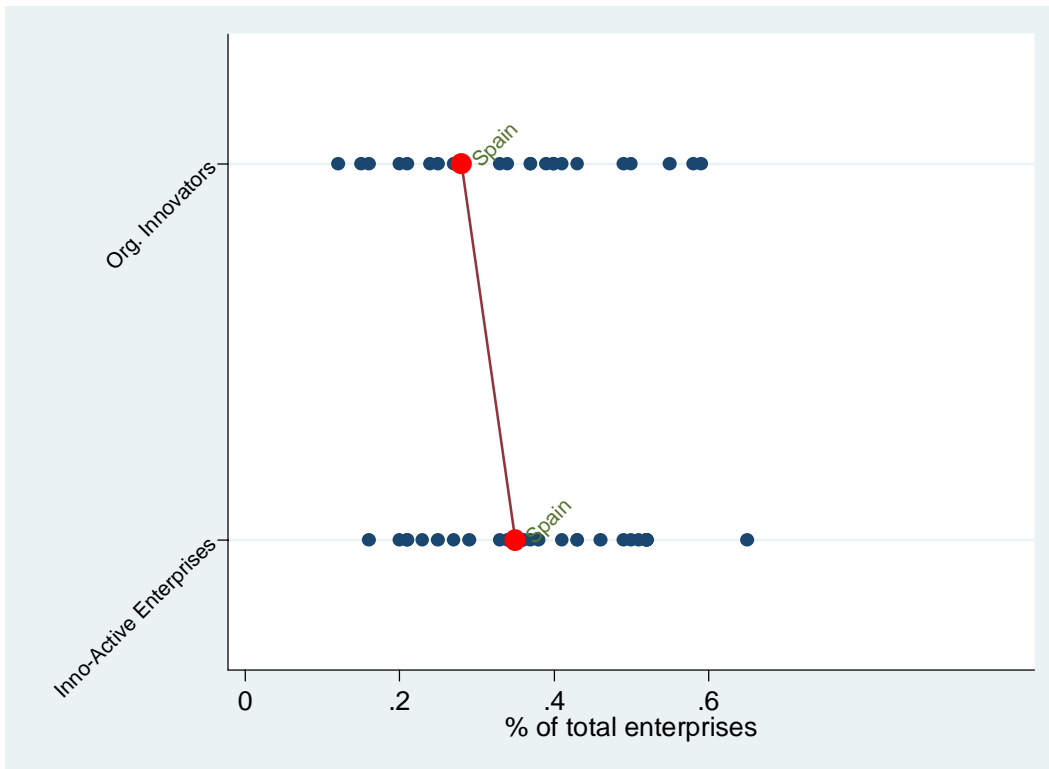


Figure 9.2

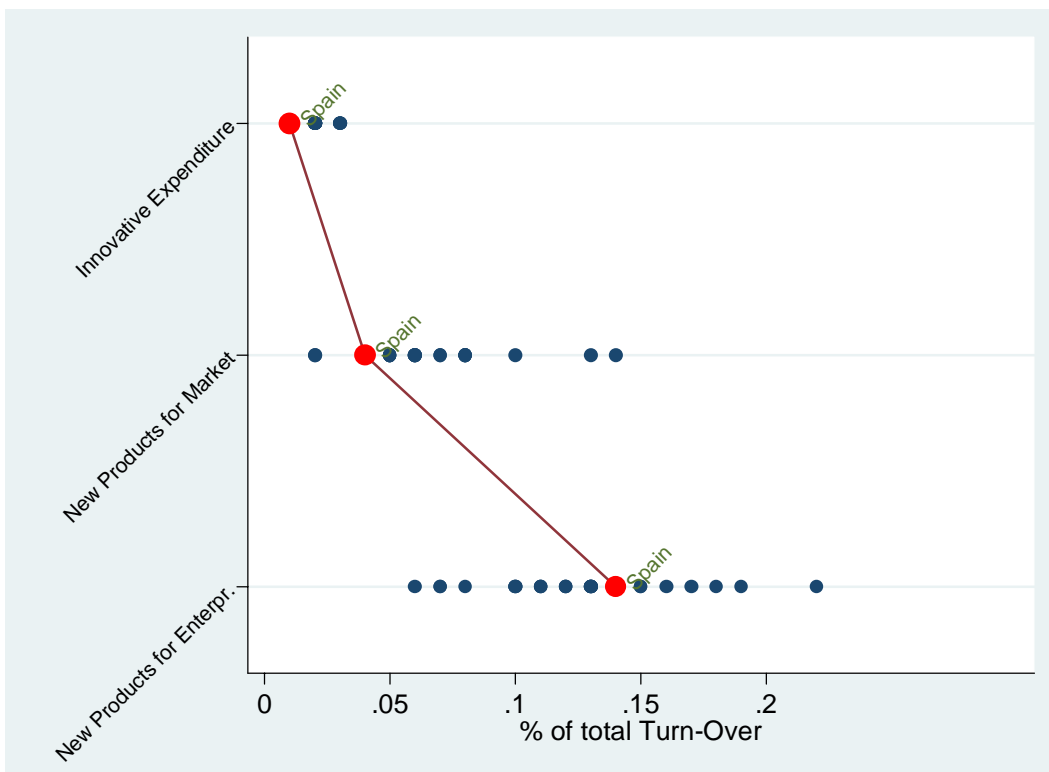
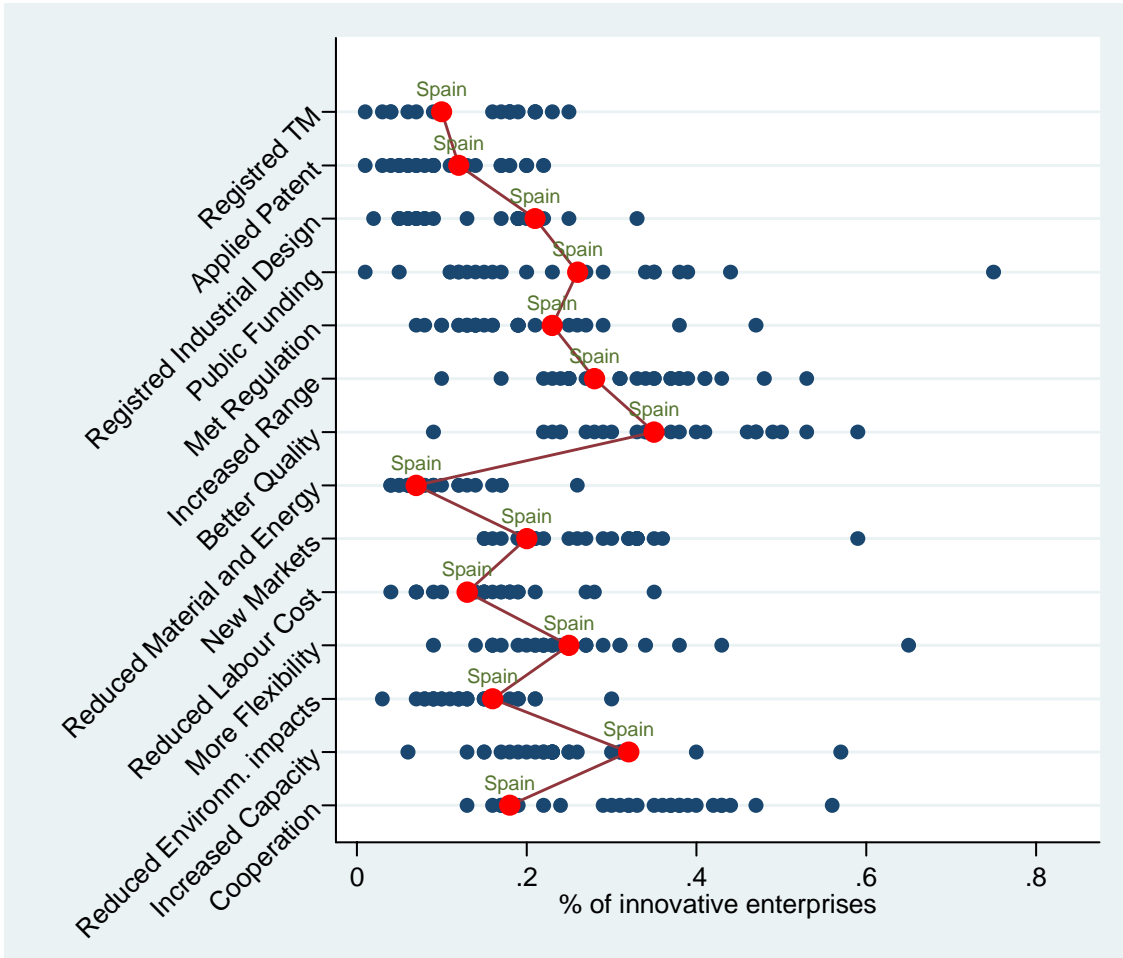


Figure 9.3



## **FINLAND (FIN)**

### ***Overall Performance***

43 % of the Finnish enterprises were “innovation active” in the years 2002-2004, which constitutes a score above average. The strongest points of Finnish innovative enterprises are about the input of new products into the market accordingly, products that are new to firms contribute 15 % of the total turnover and products new to the market have an input of 10%. Slightly less than half of the innovation ( 44 % ) has been done by Finnish enterprises in cooperation with other enterprises and/or institutes, and a high amount of the innovation has been subsidized publicly ( 35 % of total ). The country has quite a high record of intellectual property rights as well; in the given period, 18 % of all innovative enterprises have applied for a patent and 20 % have registered a trademark.

Among the most frequently mentioned effects of innovation are: increased range of goods and services ( 38 % ), improved quality of goods and services ( 43 % ) and increasing capacity of production or service provision ( 33 % ). “Reduced materials and energy per unit output” ( 10 % ) is the least quoted effect of innovation as “highly important” by innovative enterprises.

The data set from Finland unfortunately does not cover indicators on organizational innovation, their effects and innovation expenditure.

### ***Analysis by sector and size***

There is a positive relationship between firm size and propensity to innovate in Finland. Only 37 % of the small enterprises were innovation active, while this ratio goes up to 60% and 76 % for the medium-sized and large enterprises, respectively. The input of new products amounts to almost 20 % of the total turnover of large firms, whereas it remains at about 5% for small and 7 % for medium-sized ones. Large firms also prove to receive more public funds for innovation (58 %) and take part in cooperation agreements ( 74 % ) more than the small ones ( 30 % for funding and 38 % for cooperation).

The manufacturing sector performs more actively in innovation than the services (51 % versus 37 %). Computer related business activities hold the highest record of 67 % on innovation activity among all business activities, whilst the transport sector has the lowest score, only 27 %.

Figure 10.1

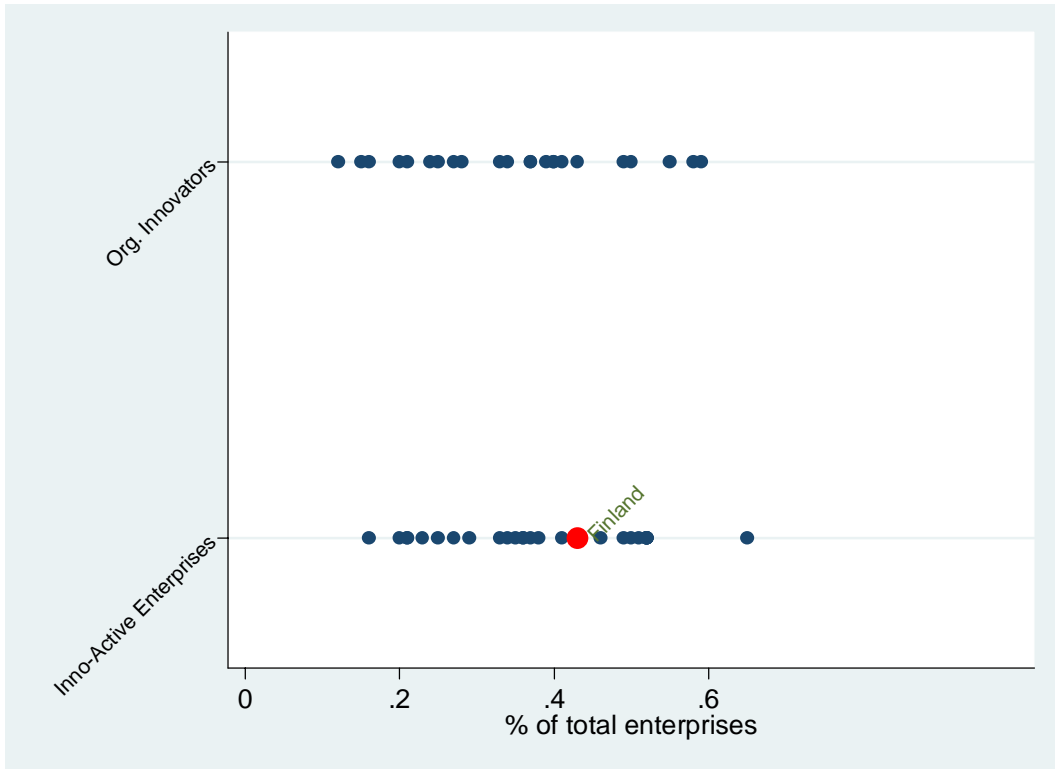


Figure 10.2

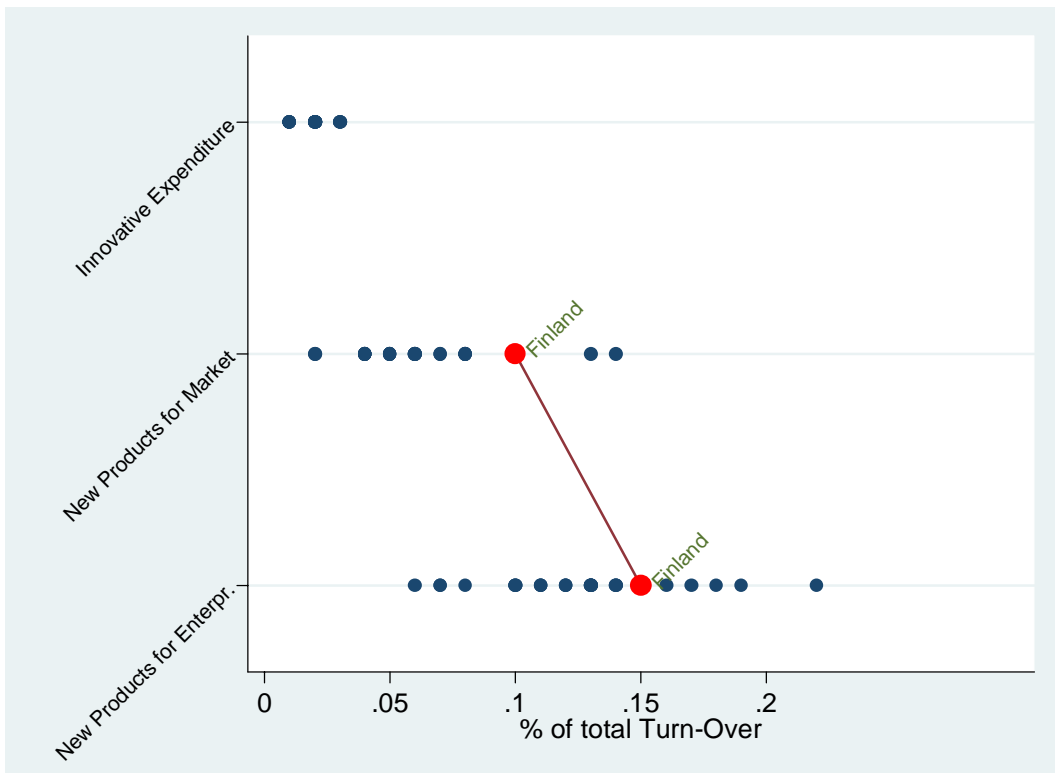
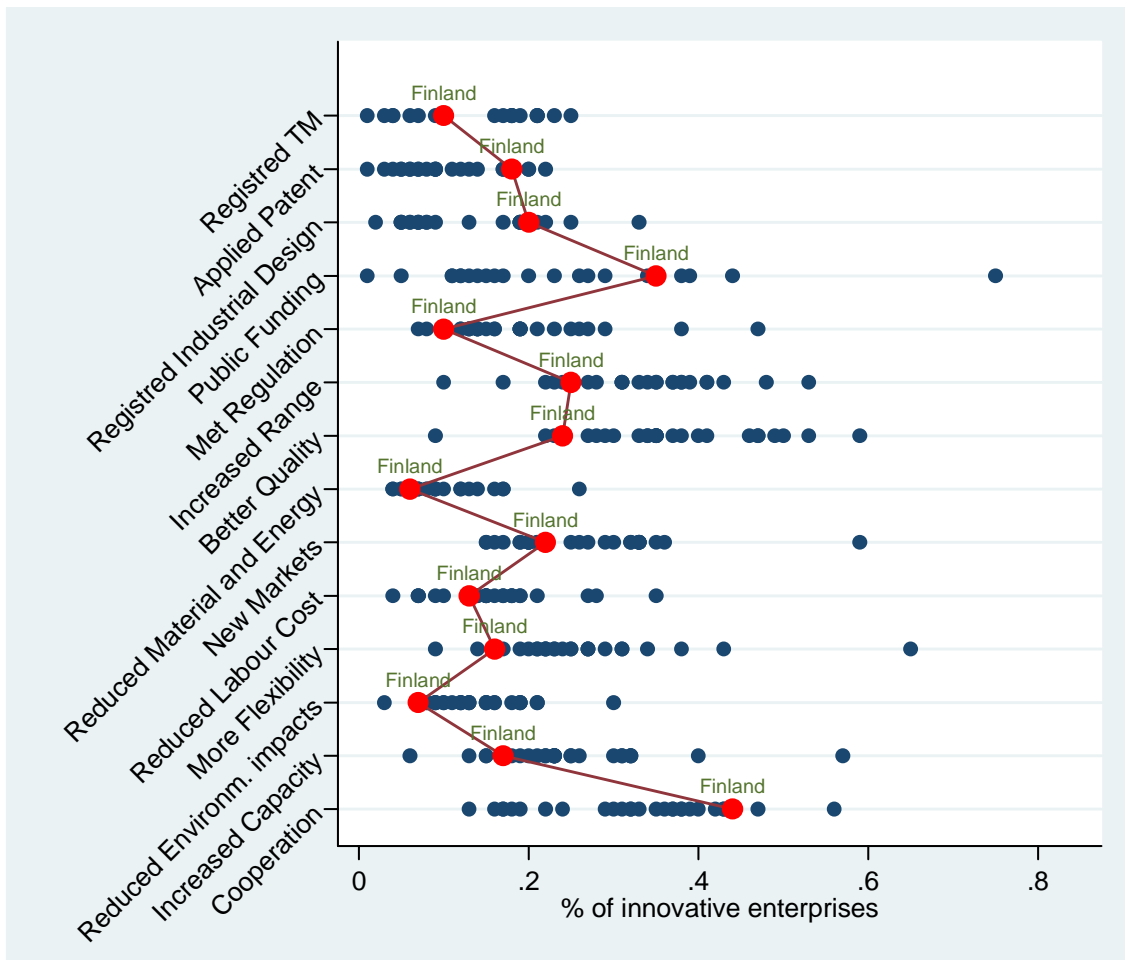


Figure 10.3



## **FRANCE (FR)**

### ***Overall Performance***

Around one third of the enterprises in France (33 %) have been carrying out product innovation activities in the period 2002-2004. In terms of organizational innovations, the ratio is slightly higher, with a proportion of 37 %. The country has an average score for the share of new products in the turnover (12 %) and for total innovation expenditures that amount to 2% of total turnover.

The main strengths of the country are observable by means of the indicators on public funding of innovation, innovation cooperation and intellectual property rights. Accordingly, one fifth of innovation done in France (20 %) is publicly subsidized and 40 % of the innovative firms have implemented their activities in cooperation with other institutes and/or enterprises. As to intellectual property rights, for the period 2002-2004, more than one fifth of all the innovative firms have applied for a patent (22 %) and around one third of them have registered a trademark (33 %).

France is also one of the leading countries in terms of realised outcomes of product and organizational innovations. Actually, more than half of the innovative enterprises stated that they have entered into new markets or increased their market share (59 %) and increased the quality and range of their goods and services as a result of innovations realized (53 %) in the reporting period. “Reduced materials and energy per unit output” (16 %) and “Reduced environmental impacts or improved health and safety” (19 %) have been least frequently quoted as important effects of innovation.

### ***Analysis by sector and size***

The gap between the innovation intensity of large and small enterprises is quite significant in France. The large enterprises are by far more innovative (73 %), spend more resources on innovation (3 % of total turnover), participate in innovative cooperation agreements (60 %) and are better in claiming intellectual property rights (48 % have applied for a patent and 56 % have registered a trademark in the reporting period) than the small ones (27 %, 1 %, 35%, 16 % and 28 %, correspondingly). The sole indicator where the gap between small and large enterprises is minimal is the percentage of innovator firms that received any form of public funding, which might be considered as strength of the country in innovation (around 20 % for all size breakdowns).

The manufacturing sector is more innovative than the services as an aggregate (36 % for manufacturing enterprises and 29 % for services). However; the finance sector is the leading one, with a record of 38 %. Not surprisingly, R&D and computer related business activities are the branches of economic activity where innovation intensity is significantly higher than the rest (62 % and 84 % respectively). In the transport sector, the innovative activity is the least intensive, with a score of 19 %.

Figure 11.1

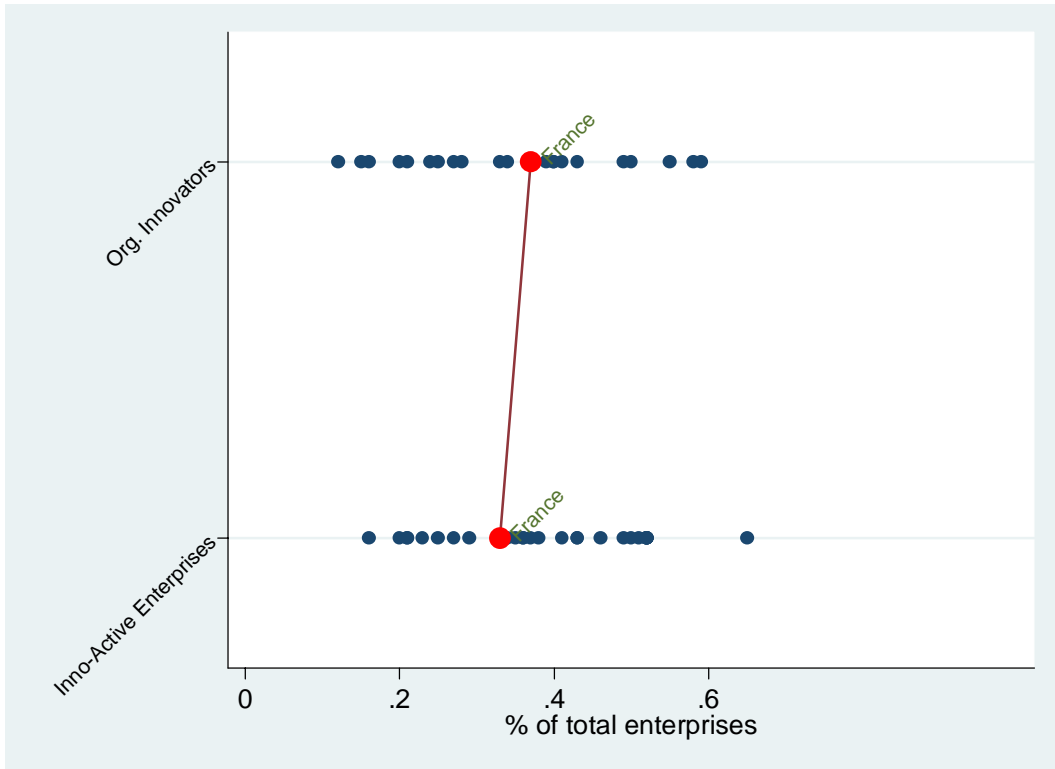


Figure 11.2

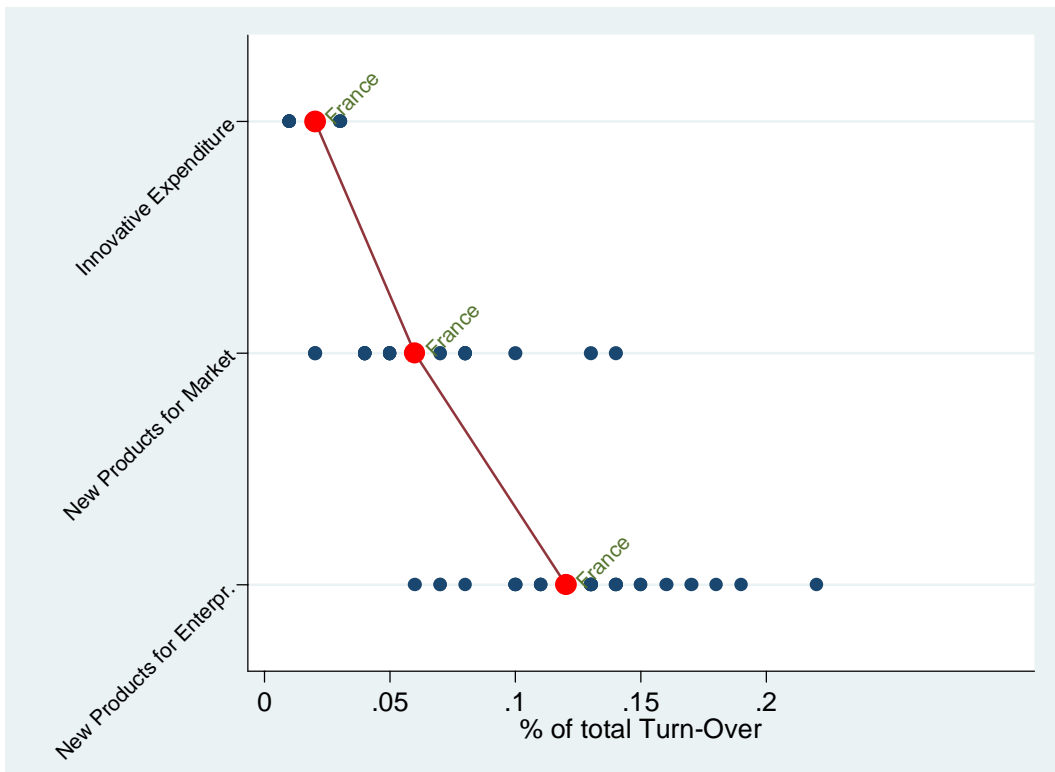
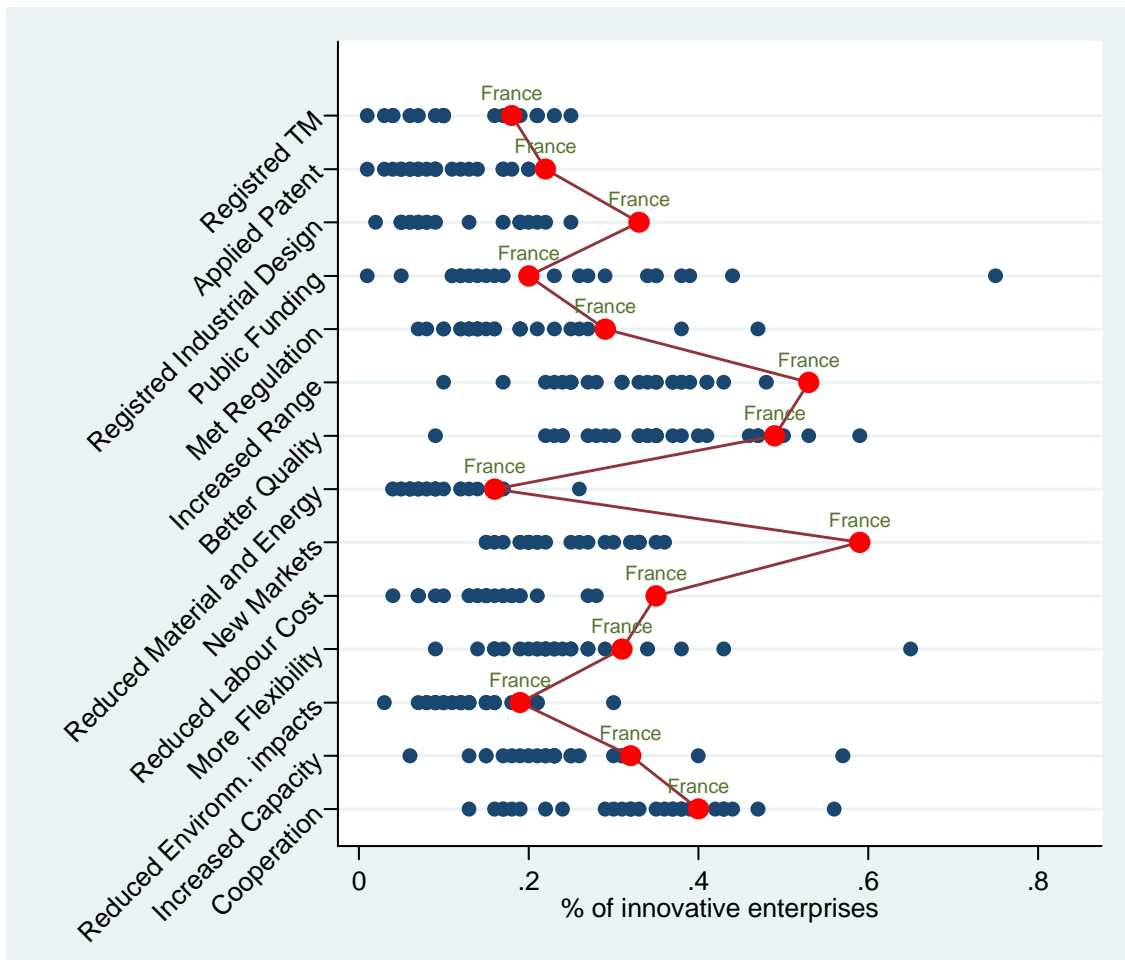




Figure 11.3



## **Greece (GR)**

### ***Overall Performance***

We regret to state that, the data set of Greece has some inconsistencies and we can only mention some of the innovation indicators that seem to have more reliable results. More than one third of all enterprises ( 36 % ) reported to have accomplished innovation activities in the years 2002-2004 in Greece. The ration is slightly higher for organizational innovations, with a track of 40 %. Concerning the share of new products in the total turnover ( 11 % ), the percentage of publicly subsidized innovation ( 29 % ), the percentage of innovators that accomplished innovation via cooperation agreements ( 24% ), the country shows an average performance overall, but seems to be one of the laggards of the former EU-15.

The most striking weakness of the country is in intellectual rights. In the given period, only 3 % of all enterprises have applied for a patent and 6 % of them have registered trademarks.

Still, the budgeted expenditure for innovation in Greece is relatively high (3 % of total turnover), showing that funds are used apparently less efficiently than in the other countries.

Among the highly important results of production innovation are improved quality of goods and services ( 59 %) and increased flexibility of production or service provision ( 43 % ). On the contrary, only 9 % of the innovative enterprises considered “reduced materials and energy per unit output” as an effect of “high importance”.

### ***Analysis by sector and size***

According to CIS-4 results, in Greece the firm size has the expected effect on the innovation activity. Among the large enterprises with 250 and more employees, 67 % had innovation activities, compared to 43% of the medium sized and 34 % of the small enterprises.

The best performing sector in terms of innovation is the finance sector ( 50 % ); manufacturing and services sectors overall have almost equal innovation intensity ( around 36 % ), unlike most of the other countries in the survey.

Figure 12.1

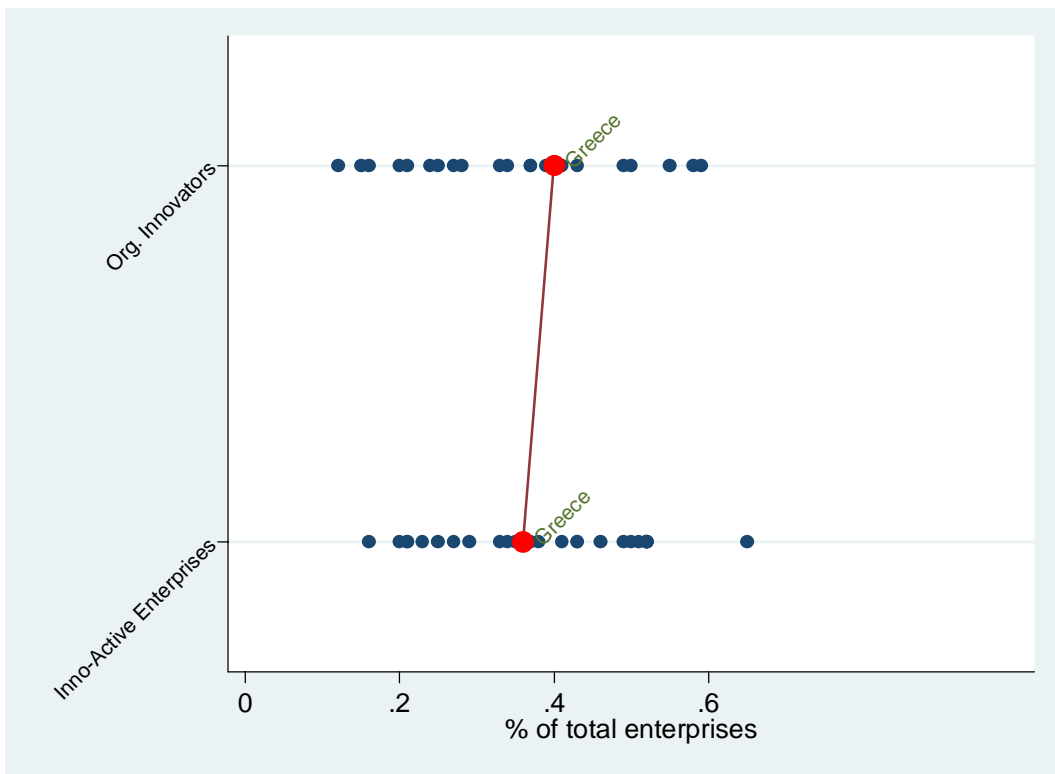


Figure 12.2

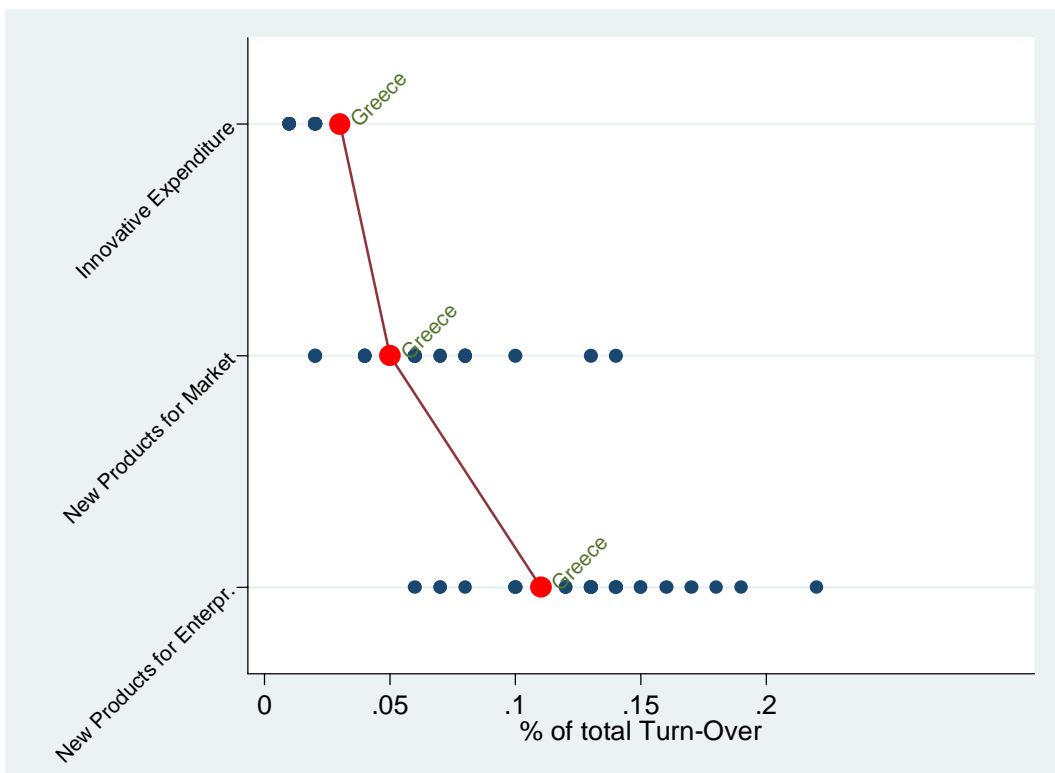
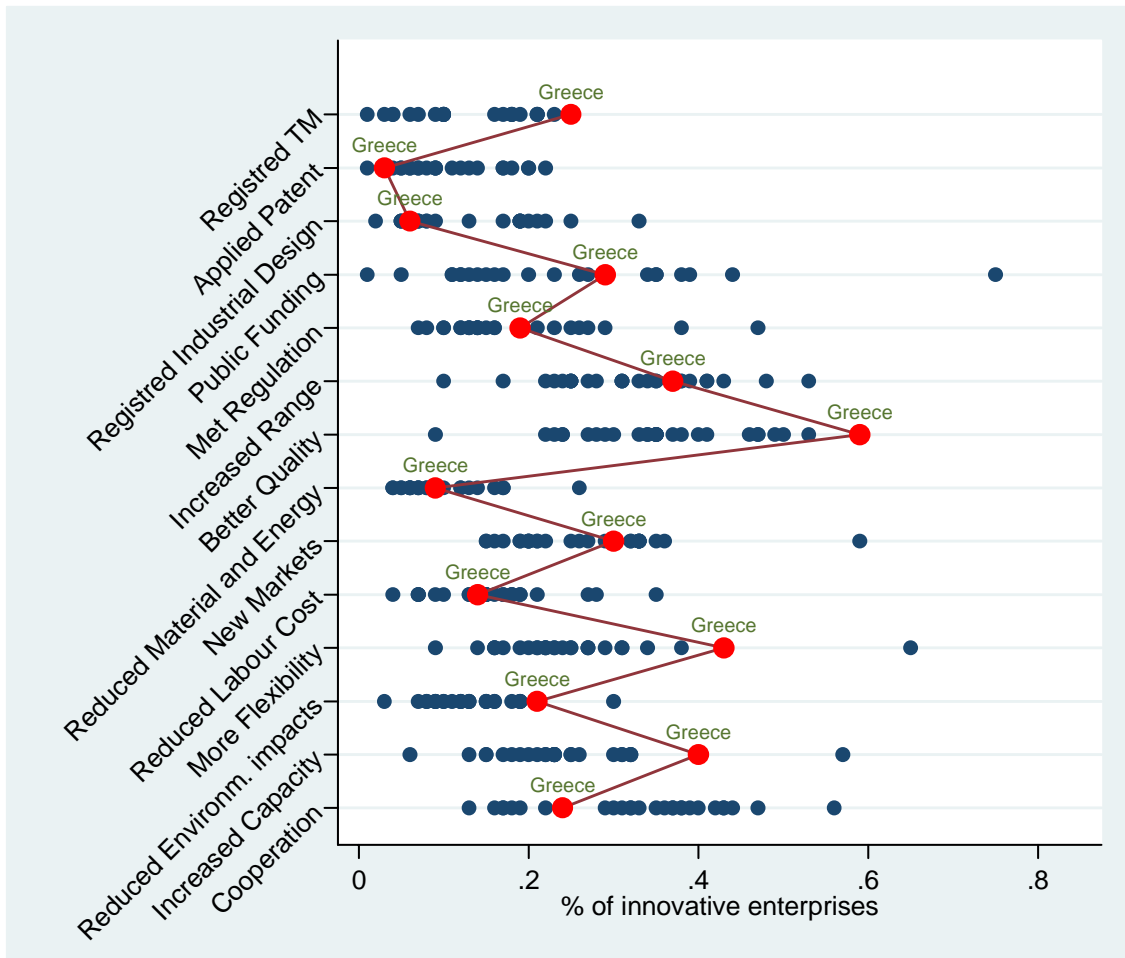


Figure 12.3



## **HUNGARY (HUN)**

### ***Overall Performance***

Only about one fifth of all enterprises (21 %) in Hungary have done innovative activities throughout the period 2002-2004. The indicator on expenditures in innovation has a poor value of around 1 % of total turnover, which might be regarded as one of the obstacles against the potential for innovation diffusion in the country. The country has relatively low scores concerning the share of new innovations in the total turnover ( 7 % ). The indicators of intellectual property right have extremely low values: for the years 2002-2004, only 6 % of all innovative enterprises have applied for a patent and 5 % have registered a trademark.

Against the low enterprise resources for innovations, almost one third of the innovative firms ( 27 % ) have received public subsidies and 37 % of them have participated in cooperative agreements while innovating, those of which can be considered as strong points of the country.

Improved quality of goods and services (35%), increased range in goods and services (31%) and reduction in the response time to customer or supplier needs (34 %) are deemed to be the mostly repeated highly important effects of product and organizational innovations in the country, whereas reduced labor costs per unit output (4 %) and reduced materials and energy per unit output (6 %) are referred rather infrequently as important effects of innovation.

### ***Analysis by sector and size***

Although the performance of Hungary as a whole is not too satisfactory, there are very significant differences as to the size and sectors within the country.

While small and medium-sized enterprises innovate not notably higher than the overall average of the country, more than half of the large enterprises ( 52 % ) reported that, in the course of 2002-2004, they have been into innovative activities. Concerning different areas of economic activity, manufacturing and services do have a comparable innovation performance (around 20 %). However, the finance division of economy (NACE J - 47%), computer and related activities (NACE 72 – 45 %) and R&D business (NACE 73 - 64 %) have by far better performance.

Figure 13.1

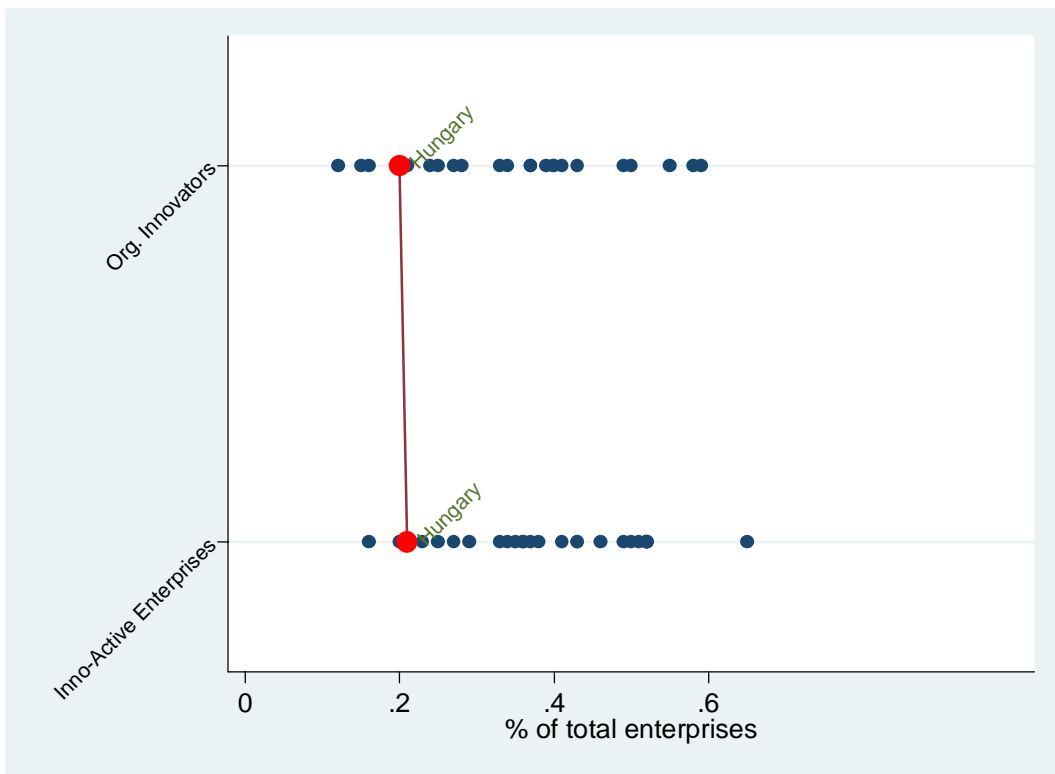


Figure 13.2

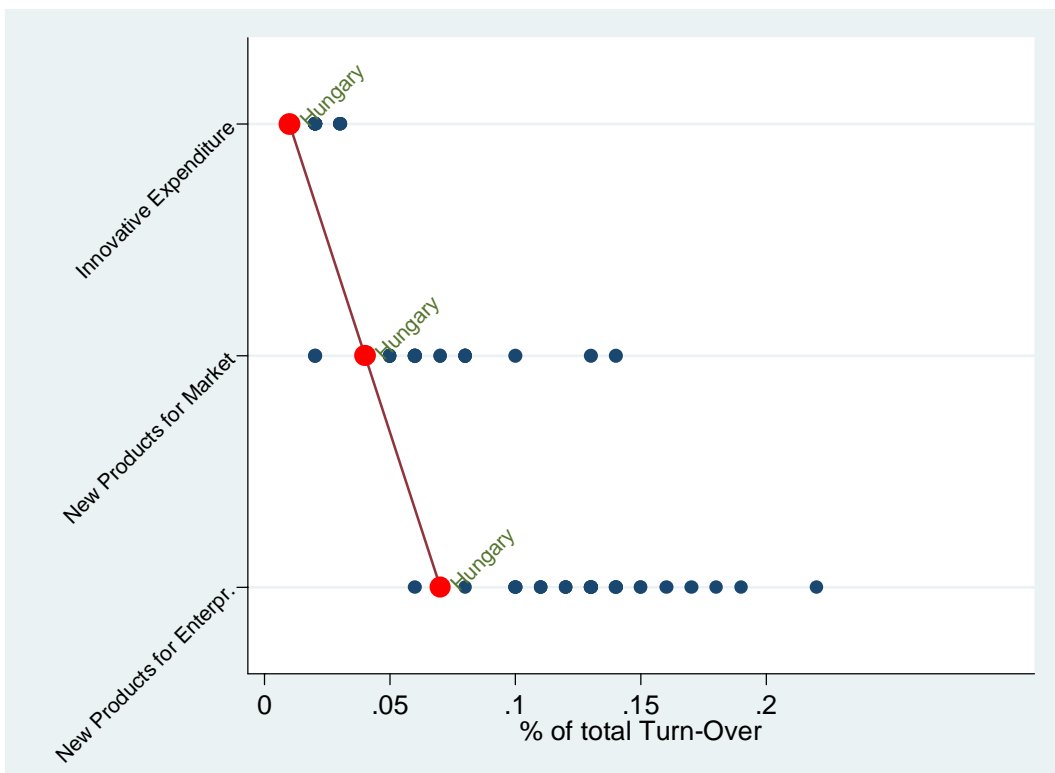
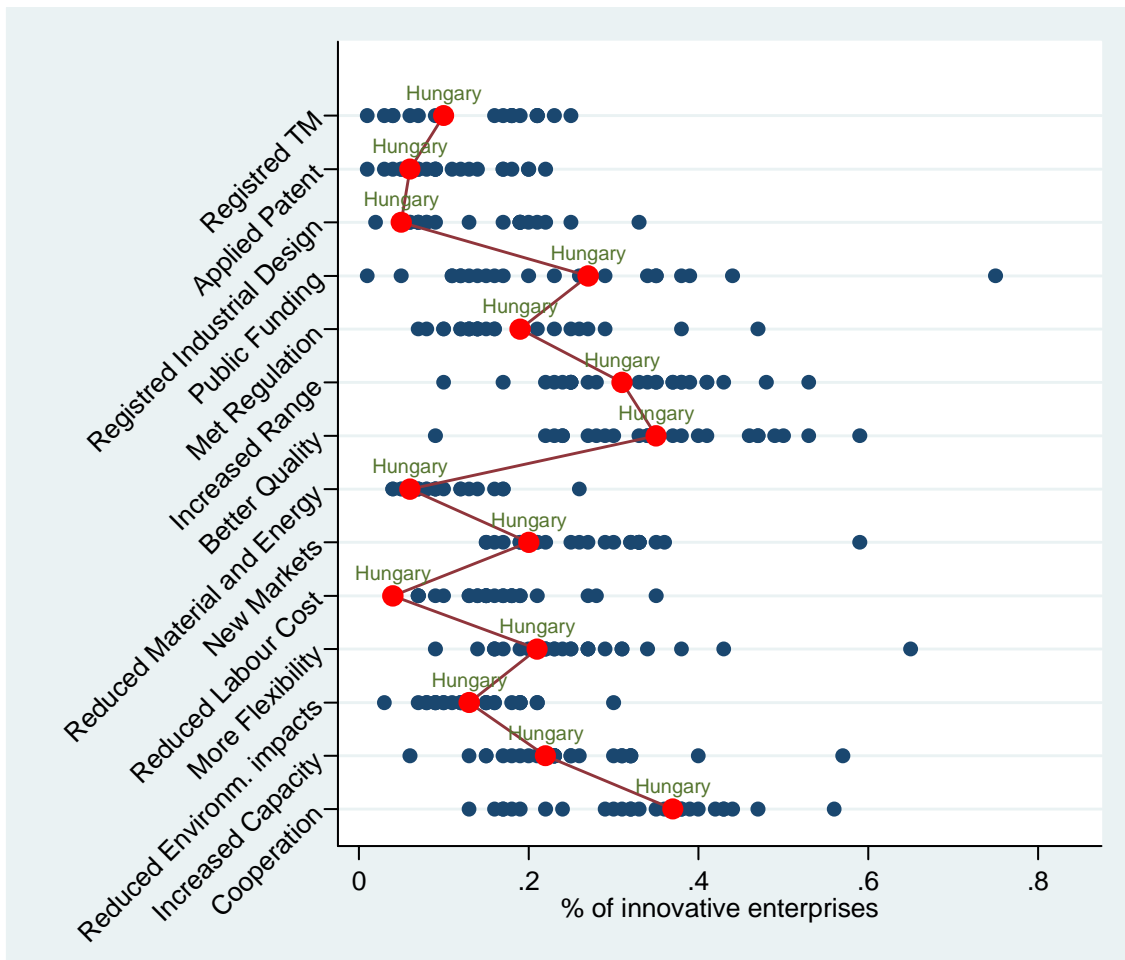


Figure 13.3



## **IRELAND (IE)**

### ***Overall Performance***

More than half of the enterprises in Ireland (52 %) have undertaken product and/or organizational innovations for the period 2002-2004, which constitutes a strong basis for the high innovation performance. Unfortunately, the results from Ireland are incomplete for indicators of public funding for innovation and effects of organizational innovations. The innovation expenditure has only an average score of 2 % of total turnover, as well as the share of new products in the turnover (10 %).

Together with innovation intensity, the main strength of the country is the high gains from innovation activities. According to the survey results, 41 % of the enterprises indicated to have increased the range of their goods and services; one third of them (about 33 %) have entered into new markets, or increased the market share and improved the quality of their goods and services as a result of their innovative activities. Even for the less frequently quoted indicators like “reduced labor costs per unit output” and “reduced environmental impacts or improved health and safety”, Ireland has a comparably high score than most of the other countries in the survey ( 10 % and 11%, correspondingly ).

Regarding patent applications the country has an average record: 17 % of all innovative enterprises have applied for a patent in the aforementioned period. What is more peculiar is that the proportion is quite critical for registered trademarks (5 % ).

### ***Analysis by sector and size***

The quality of the data on innovation indicators for sector and size breakdowns is quite poor and it is therefore not so easy to come up with an accurate analysis concerning these clusters.

Still, the simple rule as regards to the relationship between size and innovation intensity holds. The large enterprises undertake more innovative activities (75 %) than small and medium sized enterprises. Yet, it is noteworthy that the small and medium-sized enterprises in the country also have a competitive score of innovation, compared to other countries (around 50 % for small and 65 % for medium-sized enterprises).

Overall, the fraction of enterprises with innovation activities is higher in the manufacturing sector (61 %) than in the services sector (44 %). However, as mentioned before, due to the data deficiency it is not possible to highlight the specific branches of economic activity with the highest and lowest performance of innovation intensity.



Figure 14.1

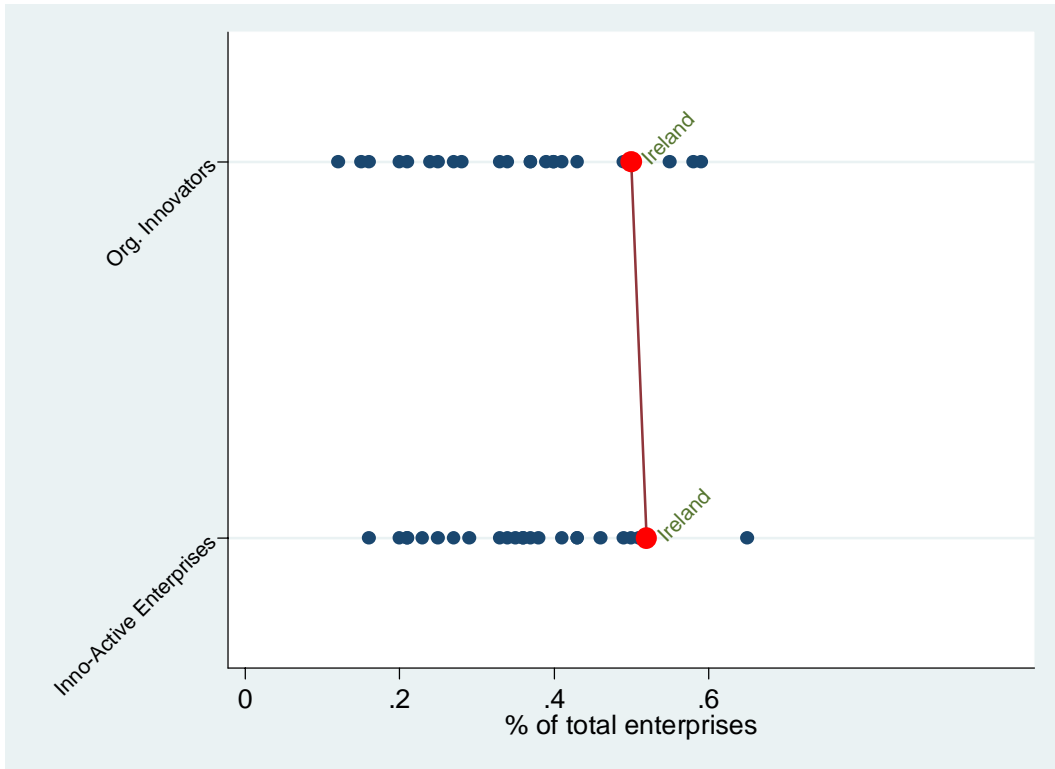


Figure 14.2

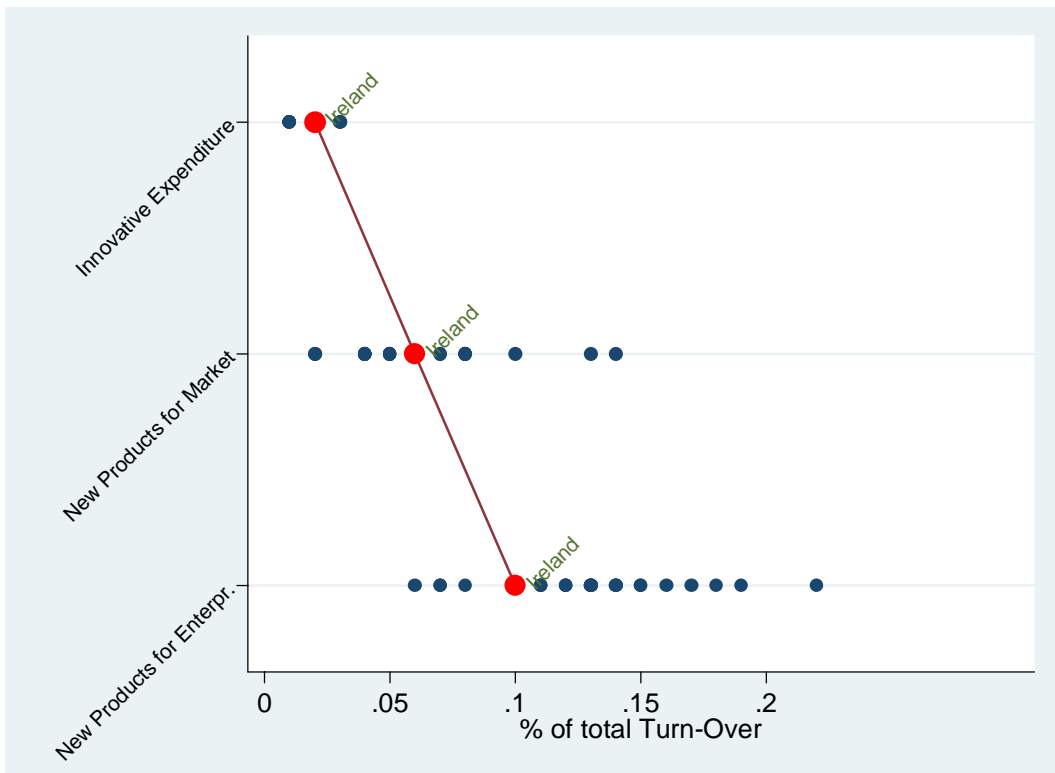
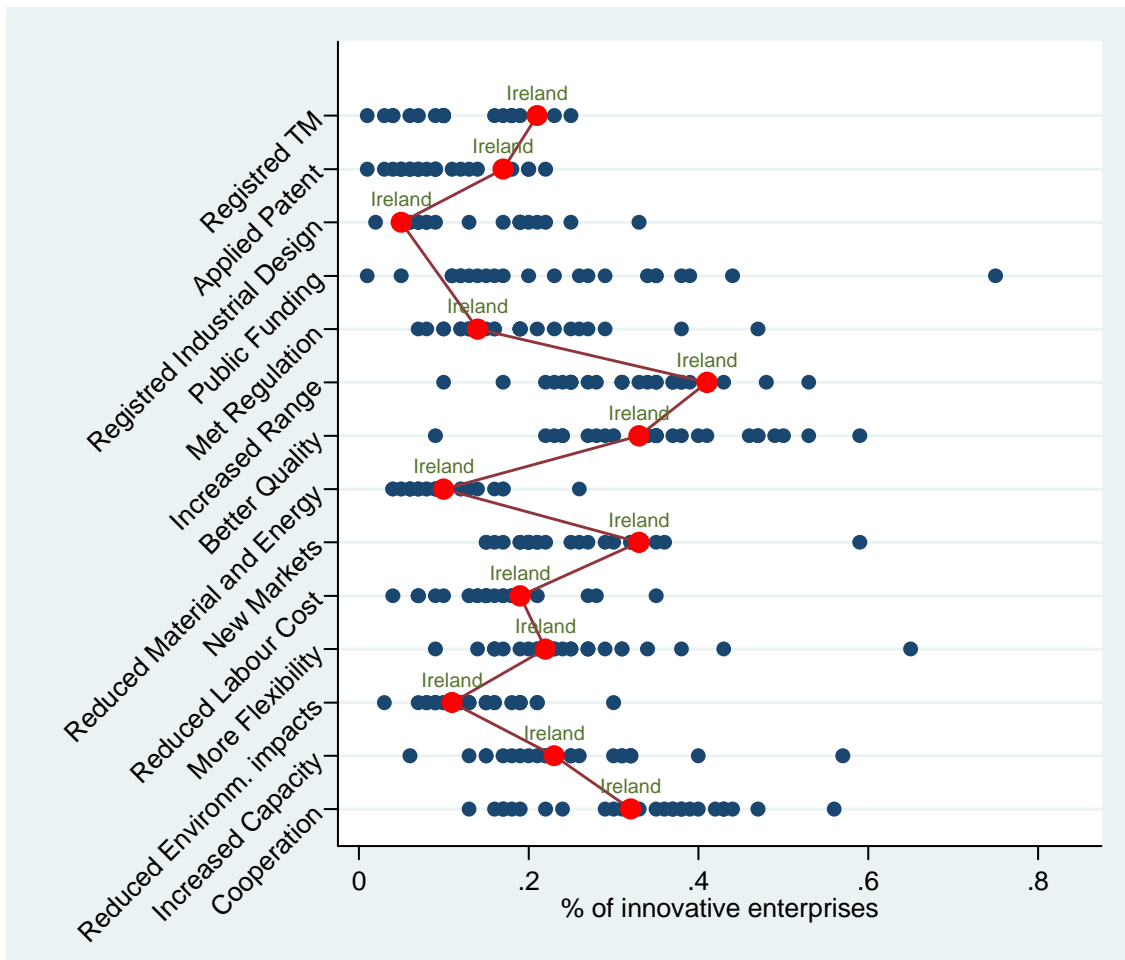


Figure 14.3



## **ICELAND (IS)**

### ***Overall Performance***

The overall picture for Iceland is quite misleading mainly due to the fact that most of the data are missing. Still, from its value of 52 % of enterprises being innovative, it can be concluded that the country has a strong innovative capacity.

Given the limited availability of the indicators for the country, the sole relative weakness of enterprises in Iceland (or more room for further improvement) seems to be on the input of innovations to the total revenue. The share of new products to the market makes up only around 5 % of the total turnover. This proportion goes up to 13 % for innovations new to the enterprise.

31 % of all innovative enterprises reported that “the improved quality of goods and services” constituted an effect of “high” degree of innovations introduced in the years 2002-2004, followed by improved quality of goods and services (23 %). Reduced environmental impacts or improved health and safety (3 %) and reduced materials and energy per unit output (7 %) were rarely reported as important effects of innovation.

### ***Analysis by sector and size***

In years 2002-2004, large firms carried on more innovative activities than the small and medium-sized enterprises (63 % versus 59 % for medium-sized and 50 % for small enterprises). However, the gap between innovative SMEs and large firms are significantly narrow in case of Iceland (only 13 % between large and small ones). This is a clear strength of the country.

Concerning the business activities, the innovation performance of manufacturing and services firms is more or less comparable ( at around 50 % ), where finance division (NACE J) is with a slight difference on top ( 54 % ). Not surprisingly, computer related business activities have the highest score among all the branches ( 92 % ) while transport (NACE I) has the lowest, 46%.

Figure 15.1

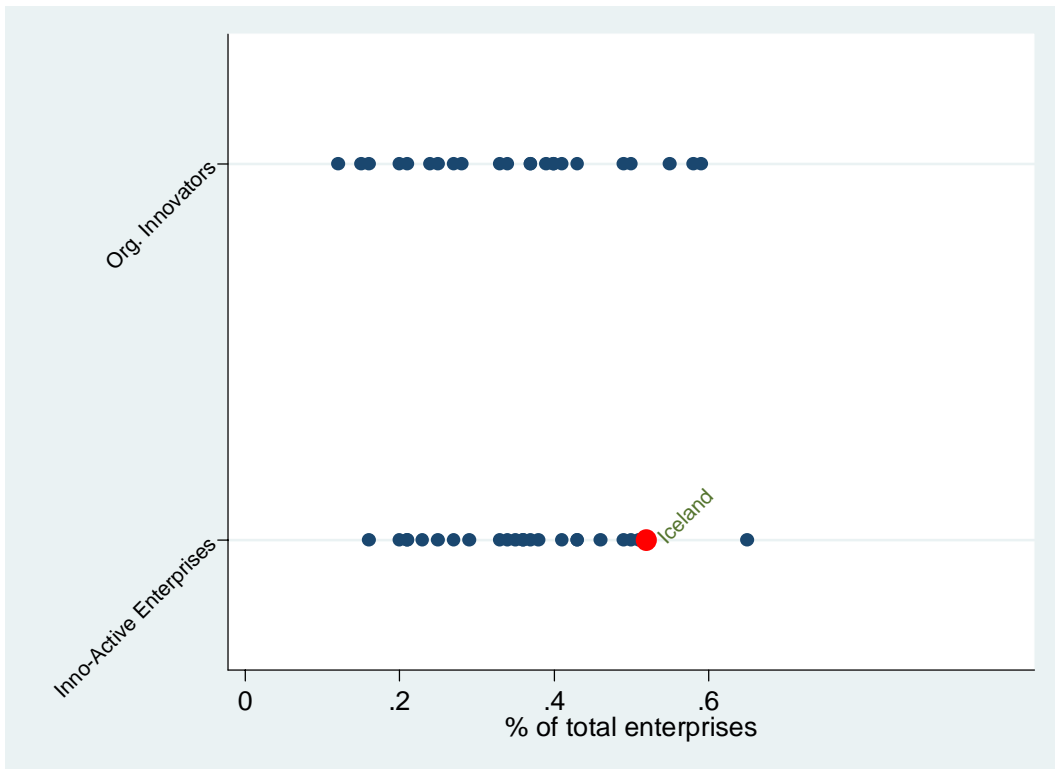


Figure 15.2

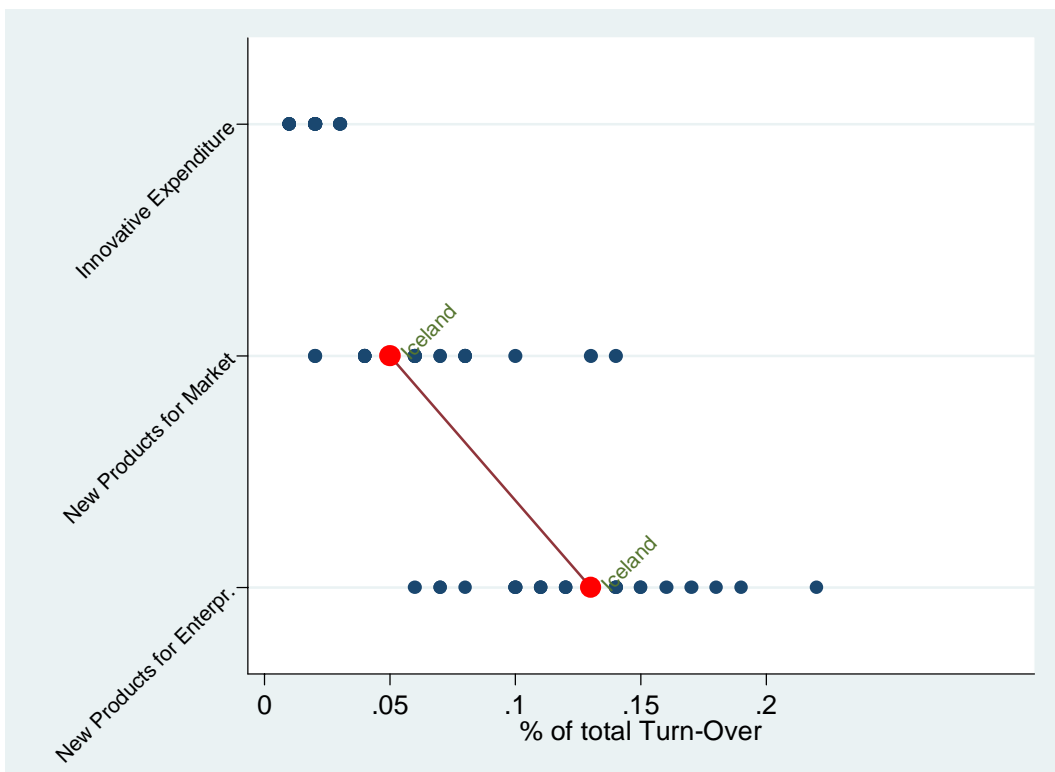
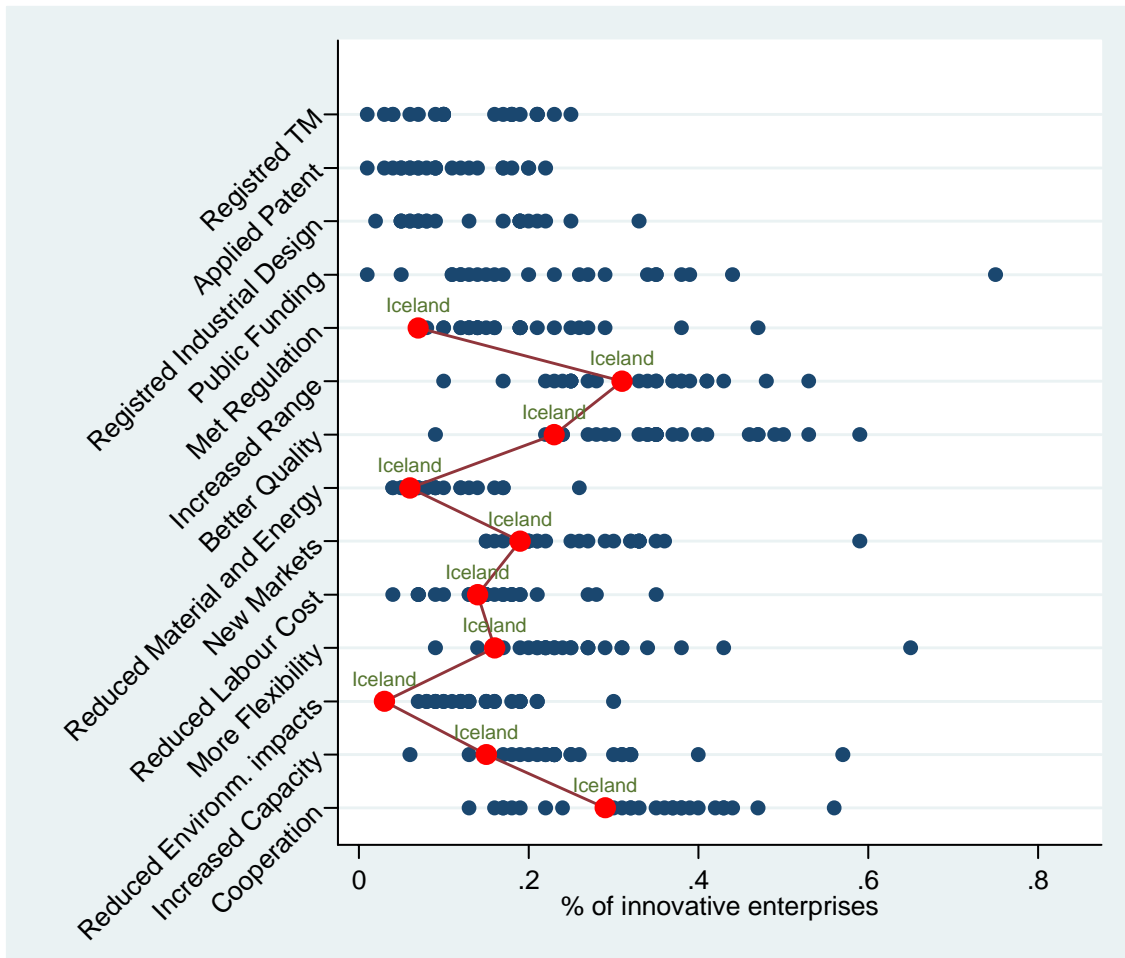


Figure 15.3



# ITALY (IT)

## ***Overall Performance***

Italy seems to be lagging behind in terms of innovation performance, compared to the other large economies of the former EU-15. According to the survey results, barely more than one third of the enterprises ( 36 % ) in Italy have initiated or carried on innovation activities within the specified period. The country shows also relatively poor performance with reference to the share of new products in the total turnover ( 12 % ) and an average score concerning the intellectual property rights (13 % for applied patents and 7 % for registered trademarks) and innovation expenditures ( 2% of total turnover).

The major weakness of the enterprises in Italy seems to be their low score in innovation cooperation with other institutes and/or enterprises. In the years 2002-2004, only 13 % of the enterprises with innovation activity participated in innovation co-operation.

Raising funds for innovation looks like the indicator with the strongest position for Italy. 39 % of all enterprises with innovation activities between 2002 and 2004 were publicly subsidized in the course of that period.

Improved quality of goods and services (34 %), increased range of goods and services (33%) and reduced time to respond customer/supplier needs (33 %) are the mostly recurrent values among the highly important effects of innovations; on the other hand, reduced materials and energy per unit output is the least, with a track of 4 %.

## ***Analysis by sector and size***

Large firms are more than twice innovative than small enterprises ( 69 % against 33 % ). They are also better on raising funds for innovation ( 44 % compared to 37 % ) as well as in taking part in innovation cooperation agreements ( 35 % against 11 % ).

Though slightly, manufacturing sector overall performs better than services in terms of innovation intensity ( 38 % versus 33 % ). The financial intermediaries sector leads the top with a score of 40 % while the R& D activities have the highest score for branch of economic activities, with a proportion of 47 % for innovative enterprises. The transport sector ( NACE I ) has the lowest score, with a proportion of only 23 % for innovative enterprises.

Figure 16.1

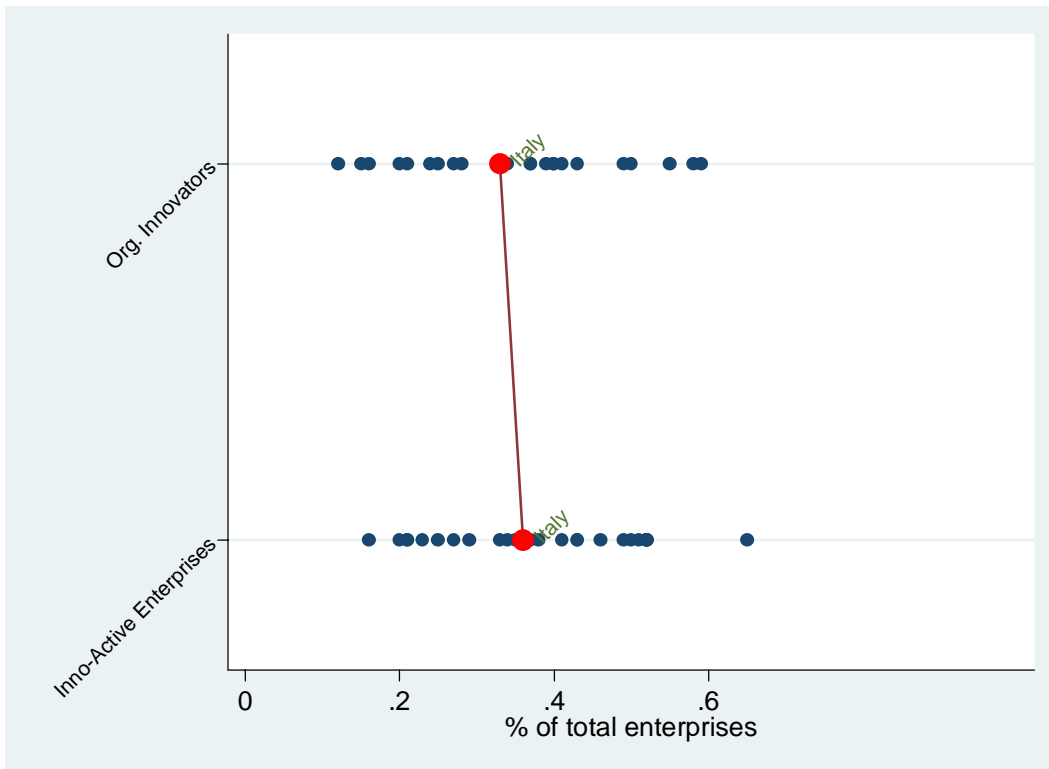


Figure 16.2

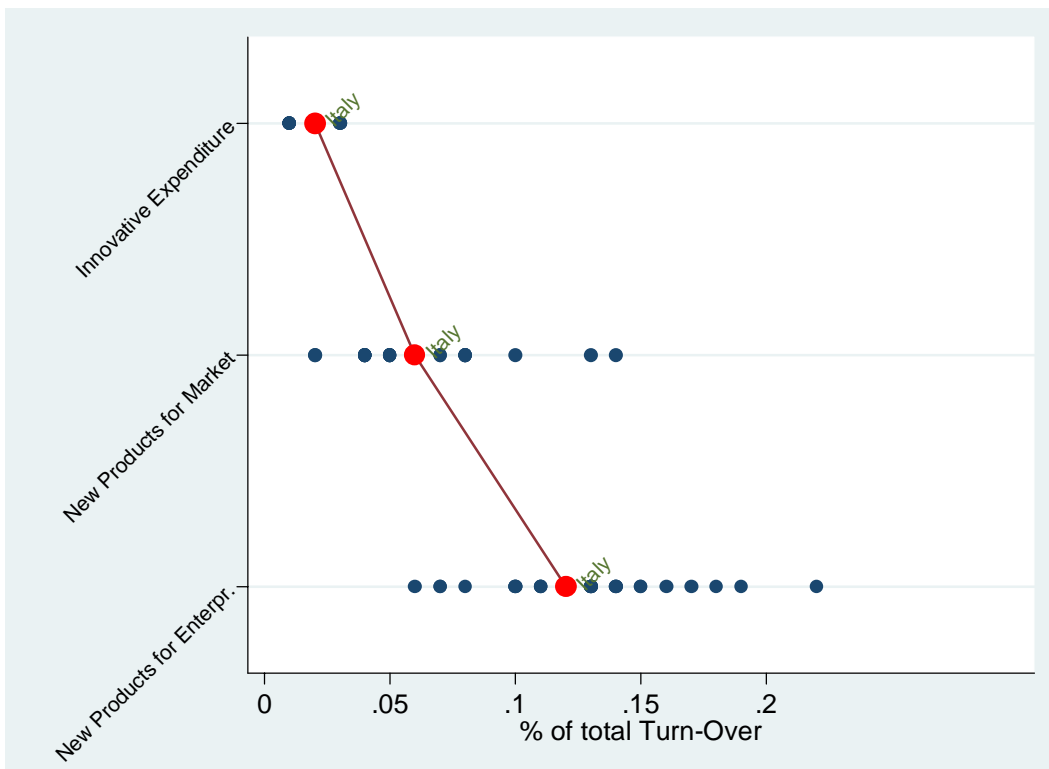
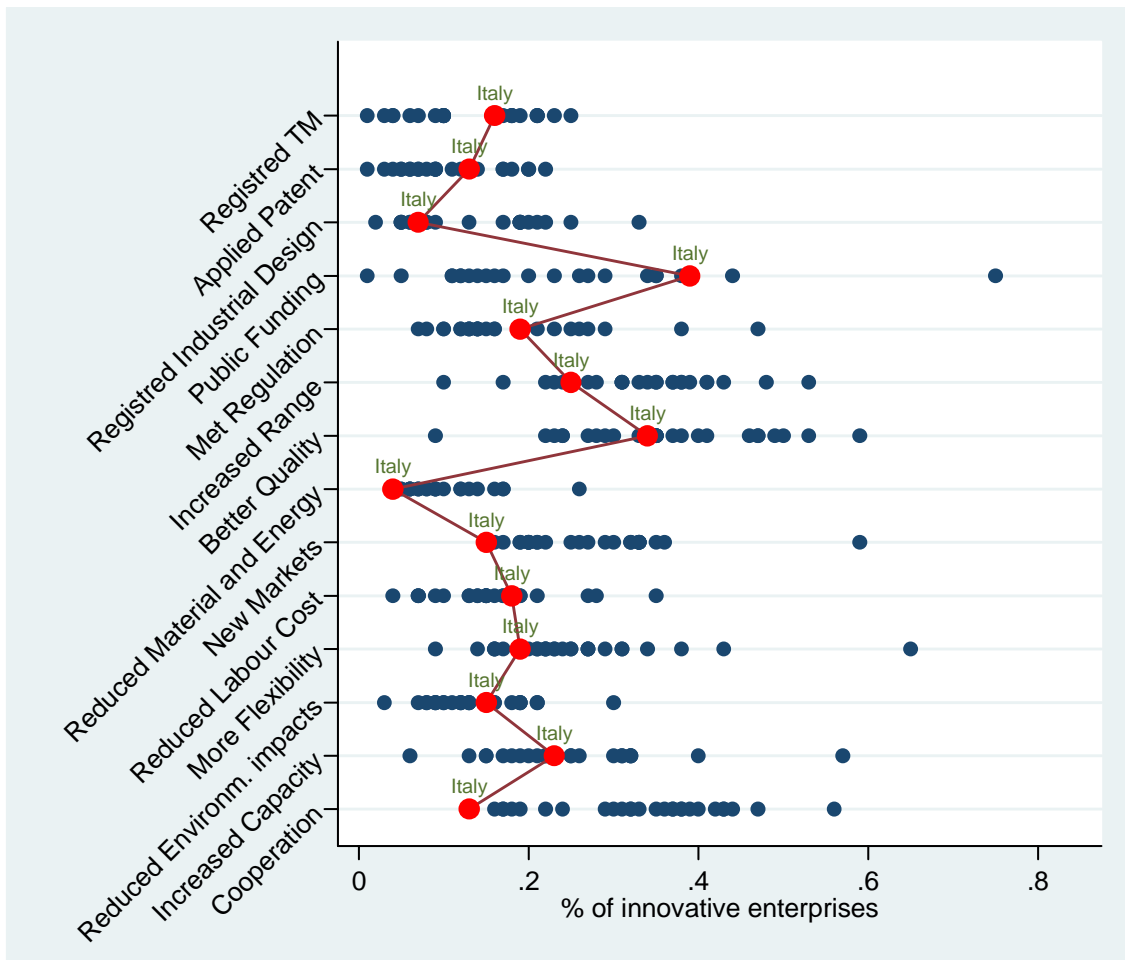


Figure 16.3





## **LITHUANIA (LTU)**

### ***Overall Performance***

Although the overall picture of the country does not show an outstanding performance compared to the new members of the EU (EU-10), Lithuania is still among the good performers with its innovation activity level of 30 %. The country has also, relative to the referred group, somewhat better score concerning share of new products in the total turnover ( 10% ) and innovation expenditure ( 2% ).

Some points of major weakness for the county are the low ratios about intellectual property rights and share of publicly subsidized innovations. Consequently, only 9 % of all the enterprises have applied for a patent and 6 % of them have registered a trademark; a sole proportion of 13 % of all enterprises with innovation activities between 2002 and 2004 were publicly subsidized in the course of this time.

Lithuania has an outstanding record on innovation cooperation: 56 % of all the companies have achieved innovation in cooperation with other institutes/enterprises.

Increased range and improved quality of goods and services ( 28 % and 24 % respectively) are the most frequently reported effects of product and organizational innovations in the country. One remarkable issue is that around 21 % of the innovative enterprises stated that innovations enabled them to meet regulations, which is an effect that is rather rarely quoted by enterprises in other countries. Among the least frequently quoted effects of innovation are “reducing materials and energy per unit output” ( 7 % ) and “reducing environmental impacts or improving health and safety” (12 % ).

### ***Analysis by sector and size***

The positive relationship between the firm size and the innovative capacity is valid in the country to a high extent. The large enterprises realized innovation activities three times more than the small sized enterprises and twice more than medium sized ones ( 22 % for small, 42 % for medium-sized and 64 % for large enterprises ).

The manufacturing sector is more innovative than the services sector overall (31 % vis-à-vis 26 %) and the best performing sector is by far that of financial intermediaries, with a record of 53 %. Again not surprisingly, R&D ( 63 % ) and computer related business activities ( 67 % ) have the highest innovation record among economic activities. The transport sector scores lowest, with a track of only 16 %.

Figure 17.1

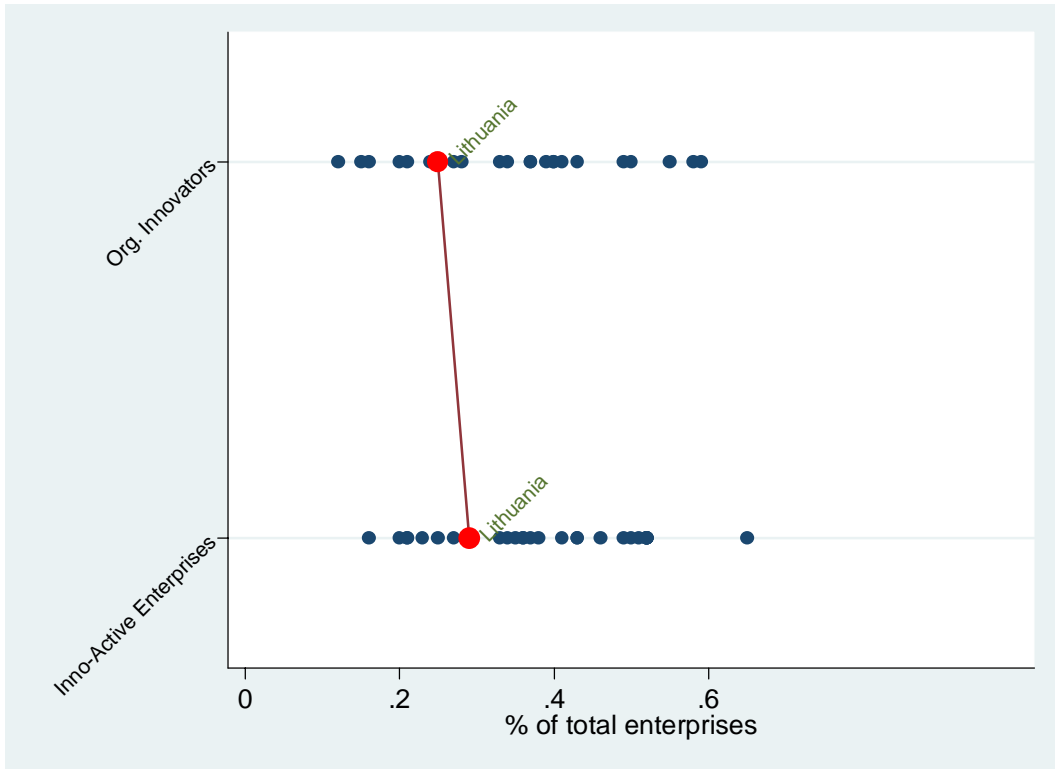


Figure 17.2

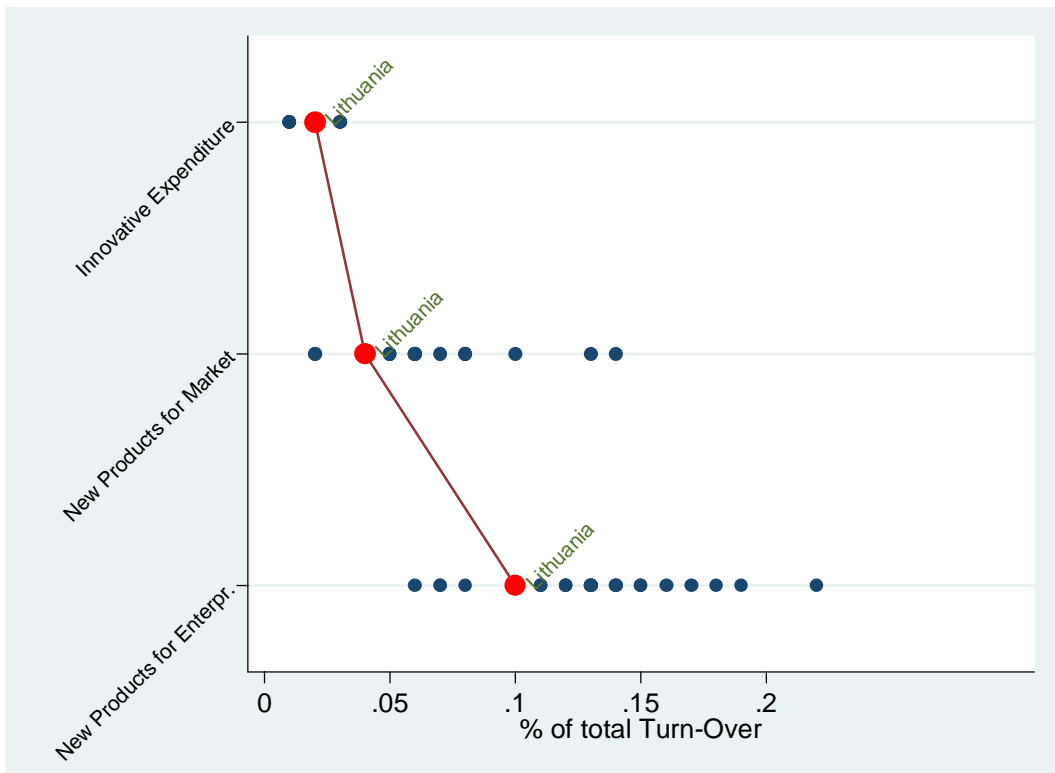
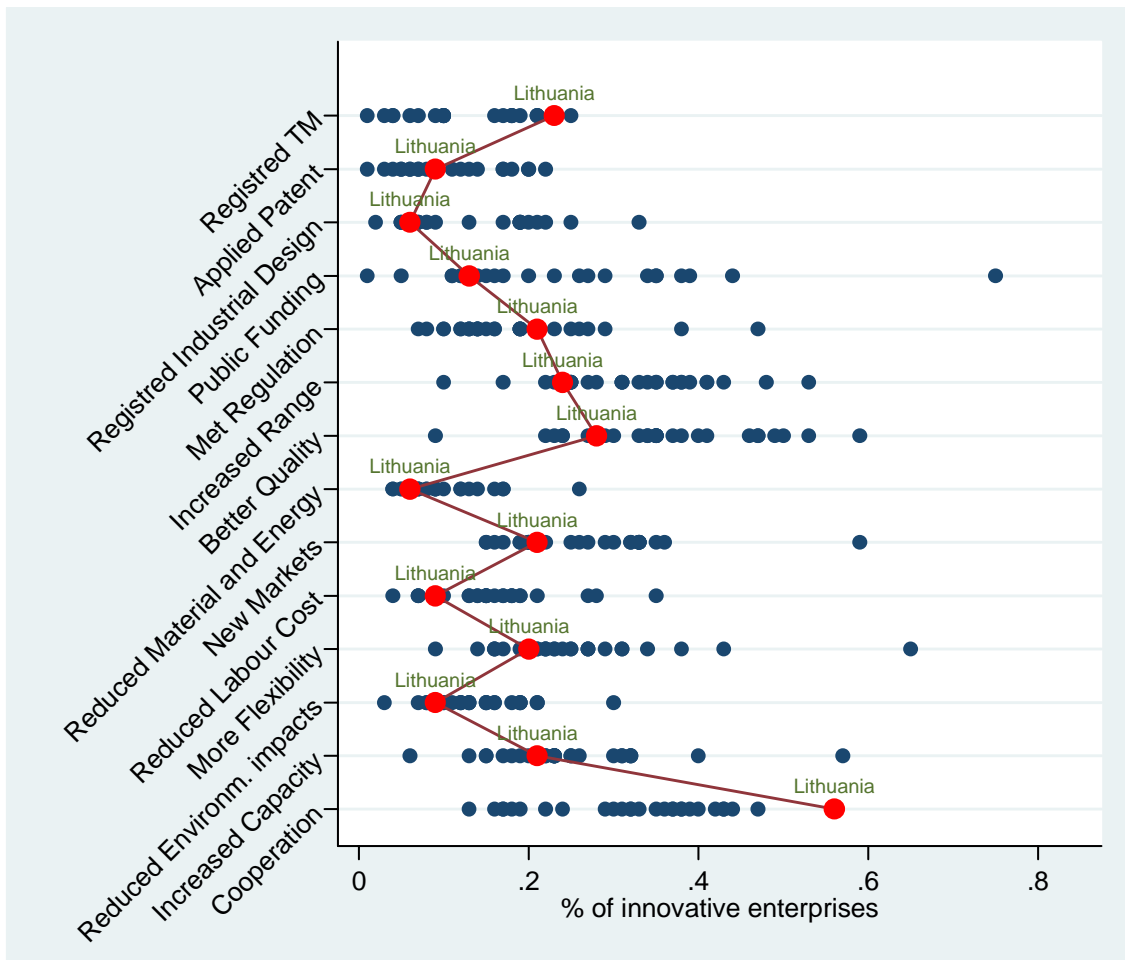


Figure 17.3



## LUXEMBOURG (LU)

### **Overall Performance**

More than half of the enterprises in Luxembourg ( 52 % ) have reported that they have engaged in innovation activities for the years 2002-2004. This percentage goes up to 59% for the organizational innovations. The contribution of the new products to the total turnover is impressively high with a record of 16 % for the new products and 6 % for the products new to the market. Three fourths (75 %) of the innovation have been realised via public funds, while 30 % of the innovative enterprises reported to have cooperated with other enterprises and/or institutes throughout the course of innovation activities.

Among the highly important effects of innovation are “increased range of goods and services” as reported by 48 % of the innovative enterprises, as well as “improved quality in good and services” (53%). On other hand, the reduction of the environmental impact as result of innovation is stated just by 16 % of the innovators and only 8% recorded to have “reduced material and energy per unit of output”.

The indicators on intellectual property rights and registered trademarks have quite low numbers for Luxembourg ( around 9 % of all innovative enterprises ), compared to the outstanding performance of the country on other indicators.

### **Analysis by sector and size**

The firm size has a strong effect on innovation activity in Luxembourg: large firms do innovate more (79 % of total) than medium-sized (63 %) and small (47 %) enterprises. This effect is reflected also in the innovation expenditures where large firms (2%) spend twice more than small firms (1%). The firm size effect still holds for innovation cooperation, with rates of 49 % for large enterprises, 38 % for medium firms and 25 % for small sized enterprises, but it is definitely smoothed for the remaining indicators where only slight differences are recorded. Significant strength of small enterprises in Luxembourg is their capacity to receive public funds for innovation more than large and medium-sized enterprises, unlike the other countries. Accordingly, 84 % of small enterprises with innovation activities between 2002 and 2004 were publicly subsidized in the course of this time, while this ration is only 51 % for all innovation active large-scale enterprises and 63 % for medium-sized ones.

In Luxembourg, the proportion of enterprises with innovation activities is higher in the services sector ( 53 % ) than in the manufacturing sector ( 46 % ). The best performing sector in terms of innovation intensity is the R & D sector (NACE73) with a record of 81%, followed by the computer related business (NACE72) with 67%. The sector recording the lowest proportion of innovative enterprises is Transport (NACE I) with a track of 36%.

Figure 18.1

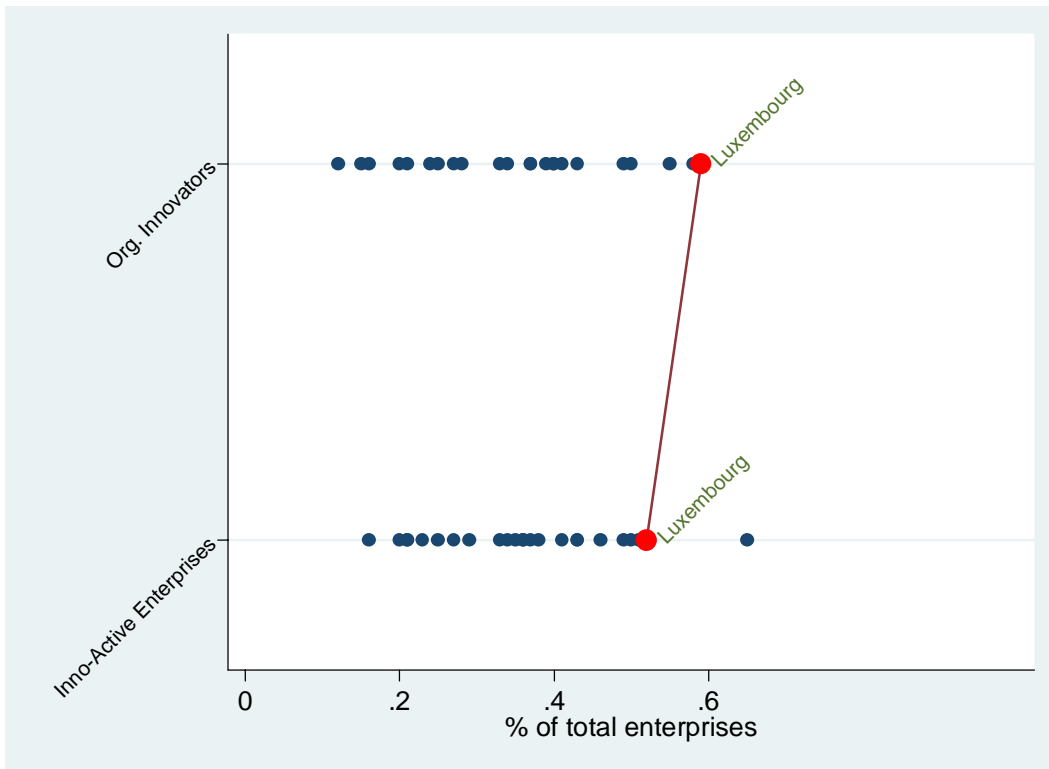


Figure 18.2

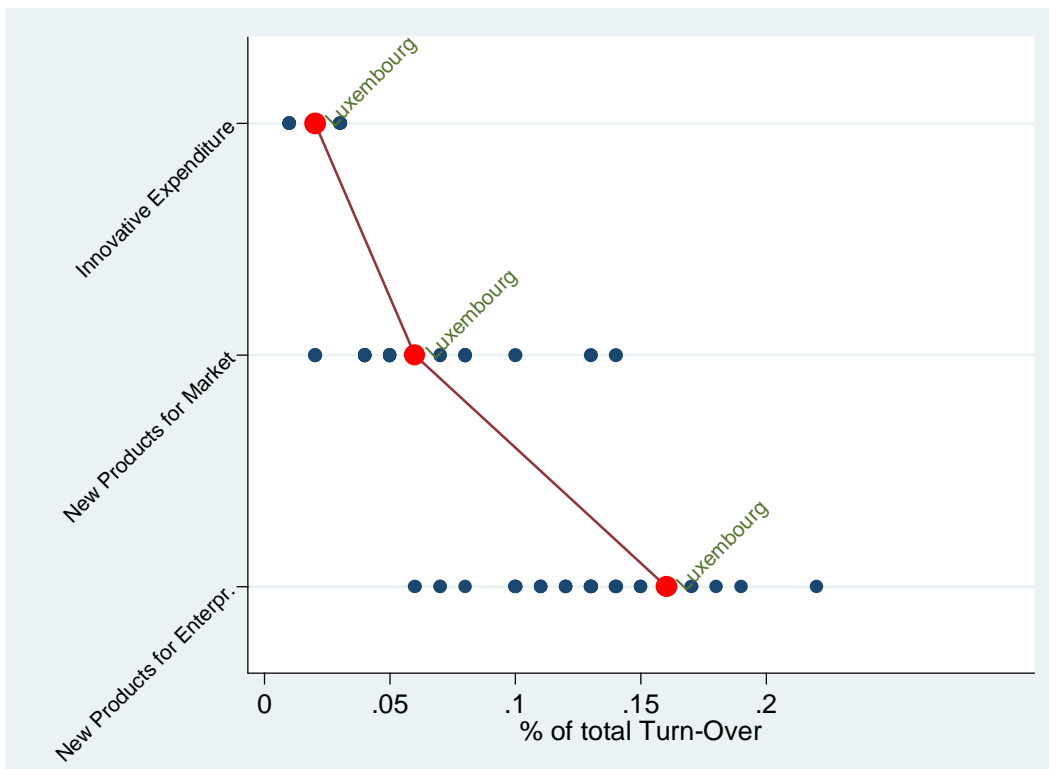
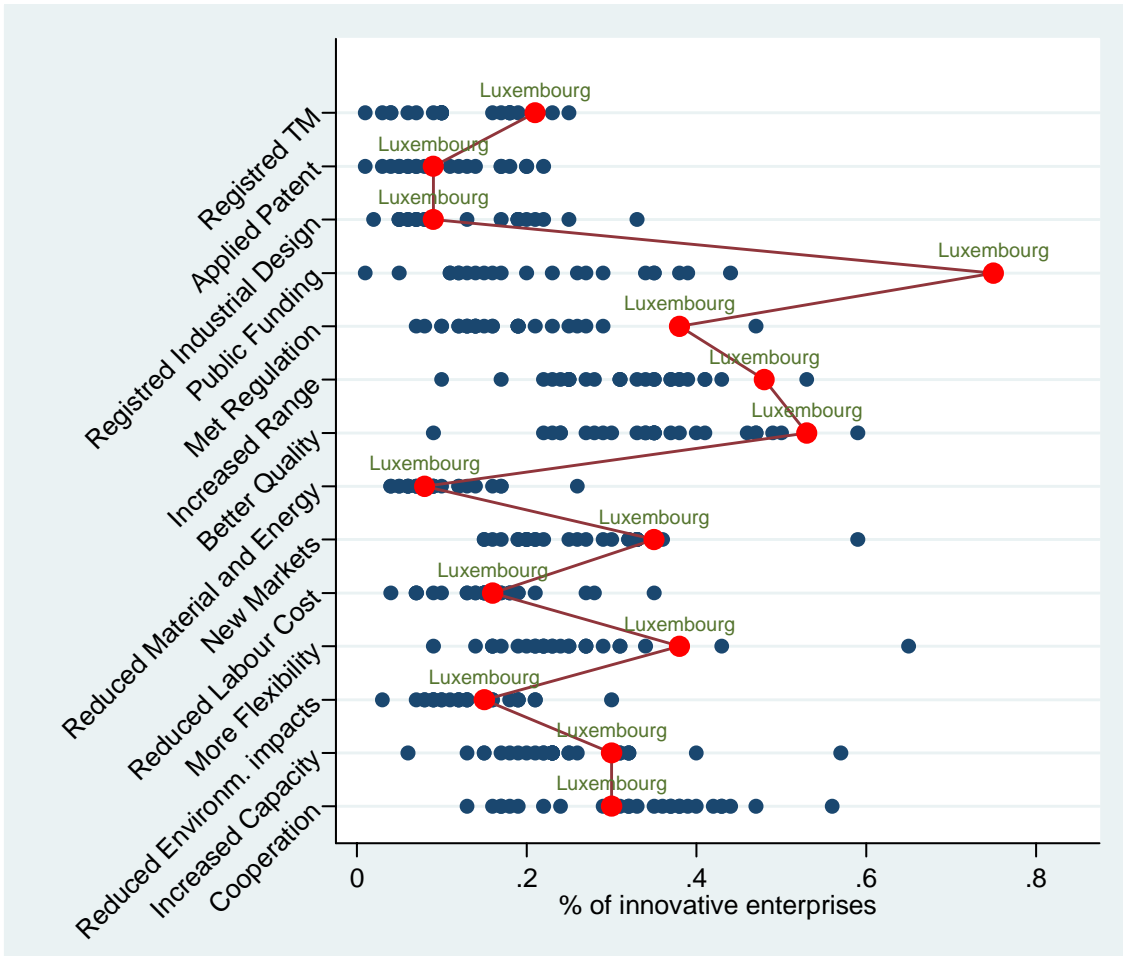


Figure 18.3



## **MALTA (MT)**

### ***Overall Performance***

The analysis of the innovation performance is highly restricted to the availability of data. Of the available indicators we see that 21 % of the enterprises have been accomplished innovative activities and 34 % of these have engaged in organizational innovation. 17 % of all enterprises with innovation activities were publicly subsidized between 2002 and 2004. 32 % of the enterprises with innovation activity participated in innovation cooperation.

In Malta, 22 % of all innovative enterprises reported that “the improved quality of goods and services” constituted an effect of “high” degree of innovations introduced in the years 2002-2004, together with improved quality of goods and services (22 %). Only 5 % of enterprises considered that “reduced materials and energy per unit output” were important side effects of innovation.

Remarkable major weakness for the county is the low ratios about intellectual property rights and registered trademarks. For the aforementioned period, only 9 % of all enterprises have applied for a patent and 8 % have registered a trademark. Another weakness is the scarcity of resources spent on innovation: according to the Community Innovation Survey results, only 1% of total turnover is spent on innovation overall.

### ***Analysis by sector and size***

The bad quality of the data makes it impossible to come up with a detailed analysis of the country regarding sector and size break downs.

Figure 19.1

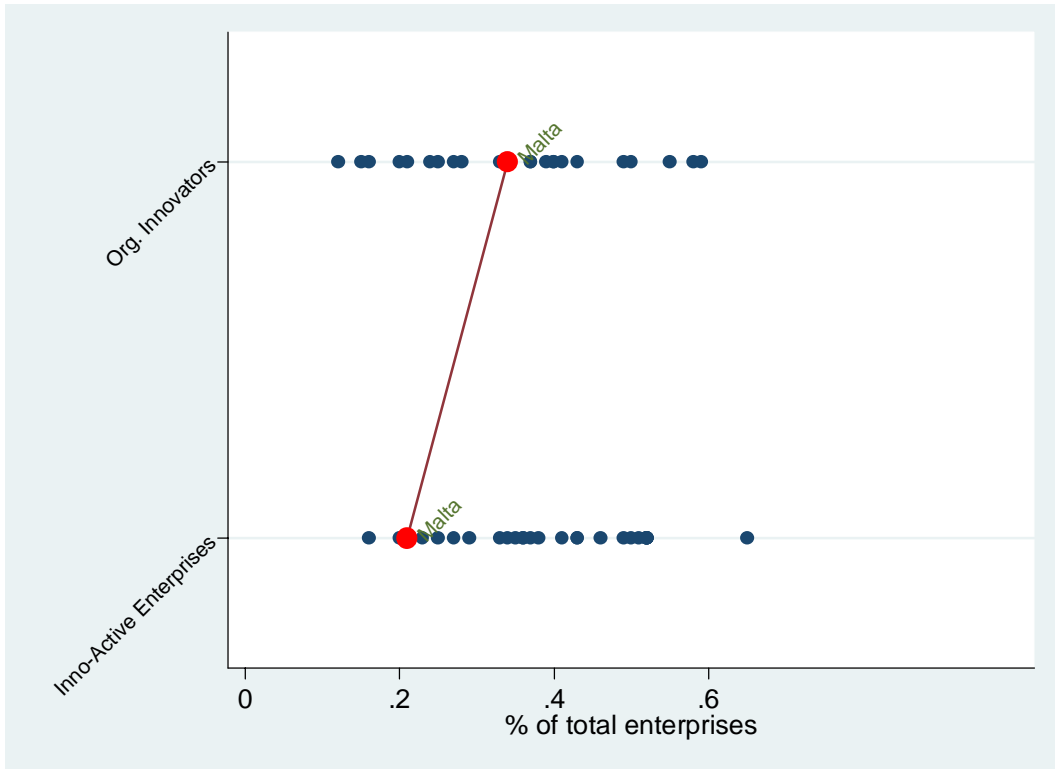


Figure 19.2

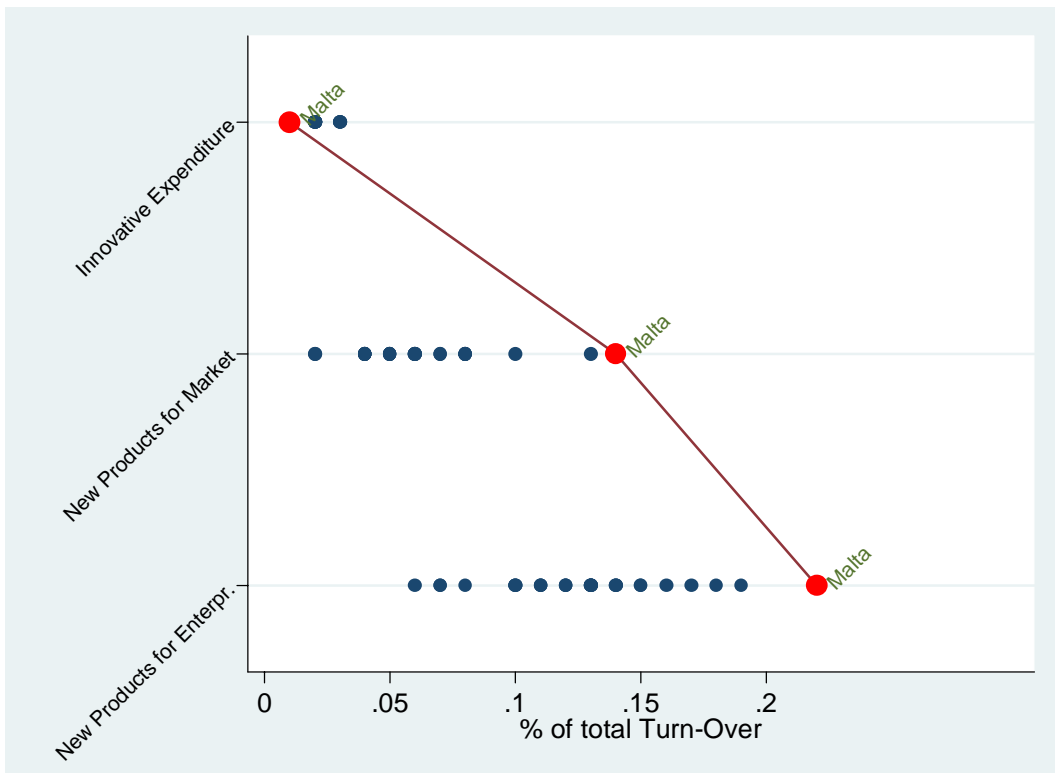
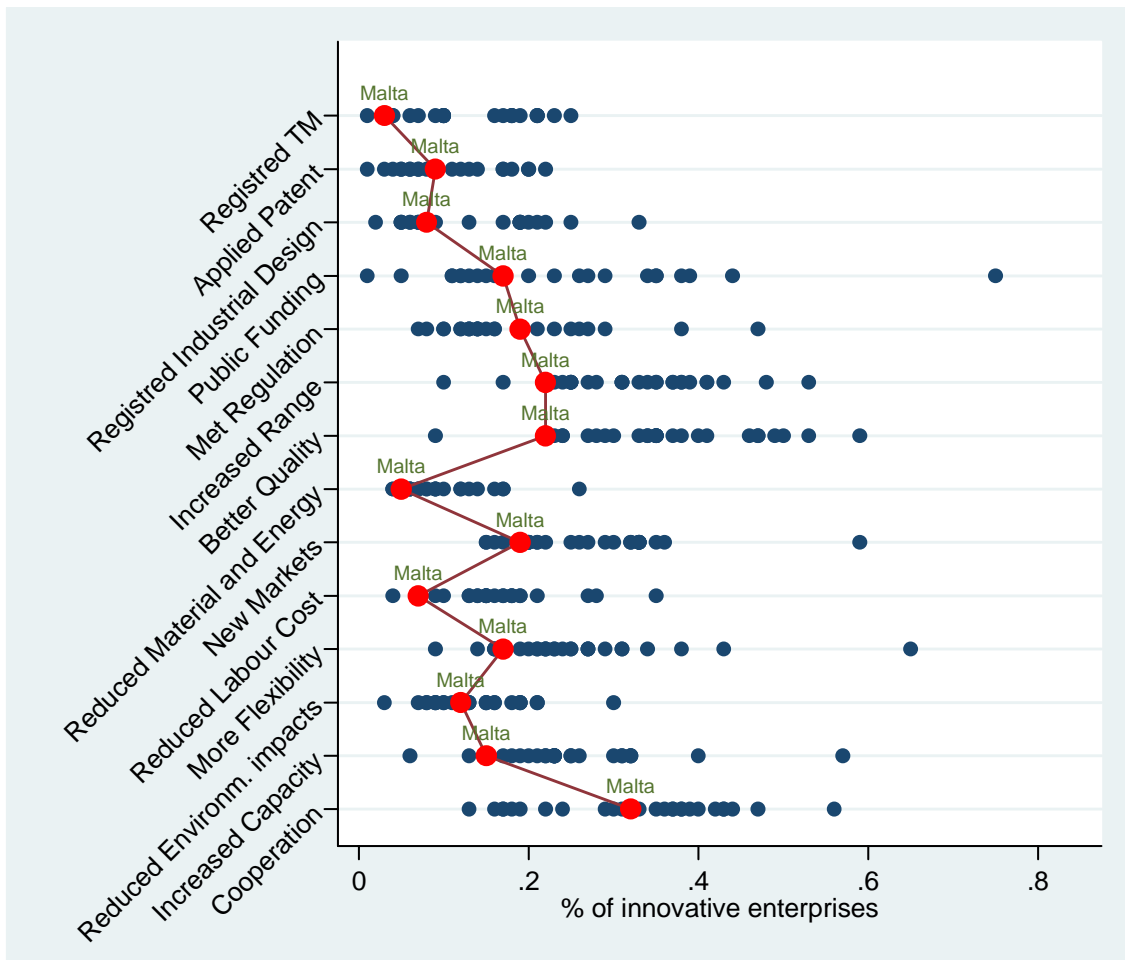




Figure 19.3



## **THE NETHERLANDS (NL)**

### ***Overall Performance***

Slightly more than one third of the enterprises (34 %) have engaged in innovation activities in the Netherlands for the time span 2002-2004. Similarly, 27 % of all enterprises have accomplished organizational innovation. 1 % of total turnover has been spent as innovation expenditure and the share of new products in the total turnover is 8%. This ration decreases to 4 % for the products new to the market. 38 % of the innovative enterprises have received public funding and 39 % have participated in innovative activities.

Contrarily to the average performance in the above-mentioned indicators, in terms of the effects of innovation, the country shows a much better performance. 47 % of the innovative enterprises reported that they have improved the quality of their goods and services while 39 % have said to increase range and 34 % have achieved improved flexibility of goods and services. Reducing environmental impacts and reducing materials and energy per unit output have remained as the least quoted effects with scores of 12 % and 13 % respectively.

The Netherlands has a surprisingly low score concerning intellectual property rights. For the period of 2002-2004, only 14 % of the innovative enterprises have applied for a patent and 17 % have registered a trademark.

### ***Analysis by sector and size***

There is a striking difference between the innovation performances of large and small enterprises in the Netherlands. Only 30 % of small enterprises have engaged in innovative activities while this ration mounts to 48 % for medium-sized and 71 % for large enterprises. The large enterprises also spend double than small and medium enterprises do on innovation ( 2 % of total turnover versus 1 % ) and have more likeness to obtain innovation subsidies: while 55 % of all innovation active large-scale enterprises received public financial support, only 32 % of the small enterprises did so. Similarly, the dependency of innovation co-operation on firm size is particularly high: whilst only 33 % and 49 % respectively of the small and medium enterprises co-operated on any of their innovation activities, 67 % of large enterprises did so.

The manufacturing enterprises are more innovative than the ones in service sector in the country ( 42 % vis-à-vis 29 % ). The most innovative branch of economic activity is computer related business with a rate of 54 % while the transport sector is the one lagging behind with 18 %.

Figure 20.1

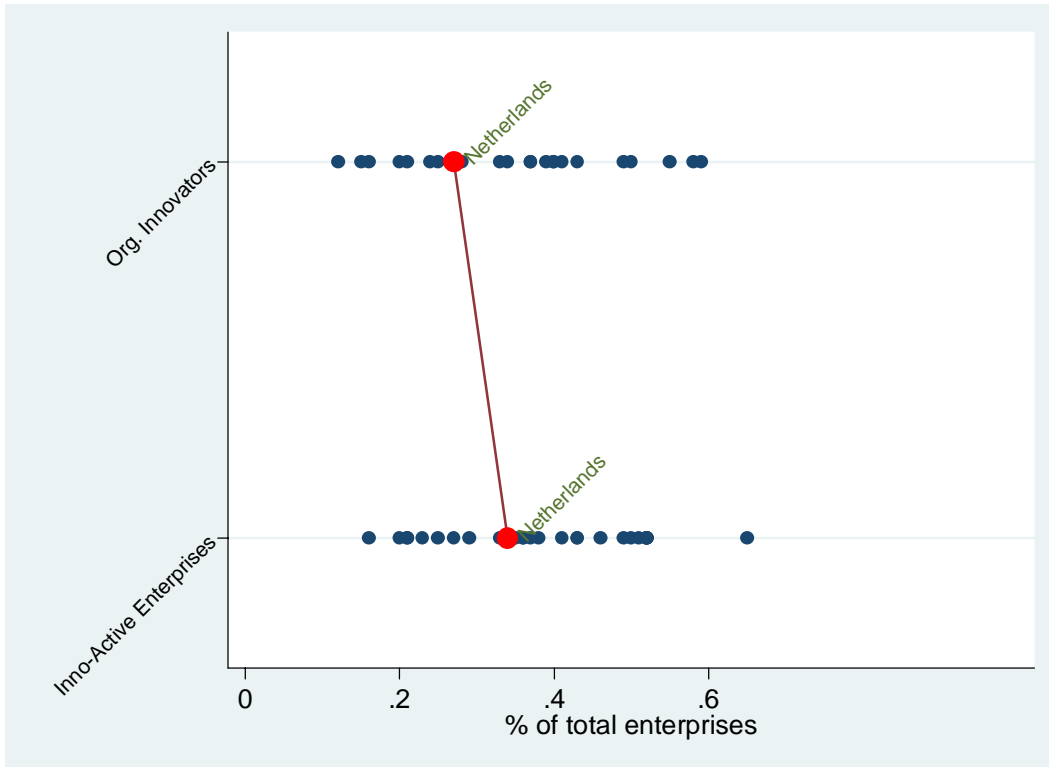


Figure 20.2

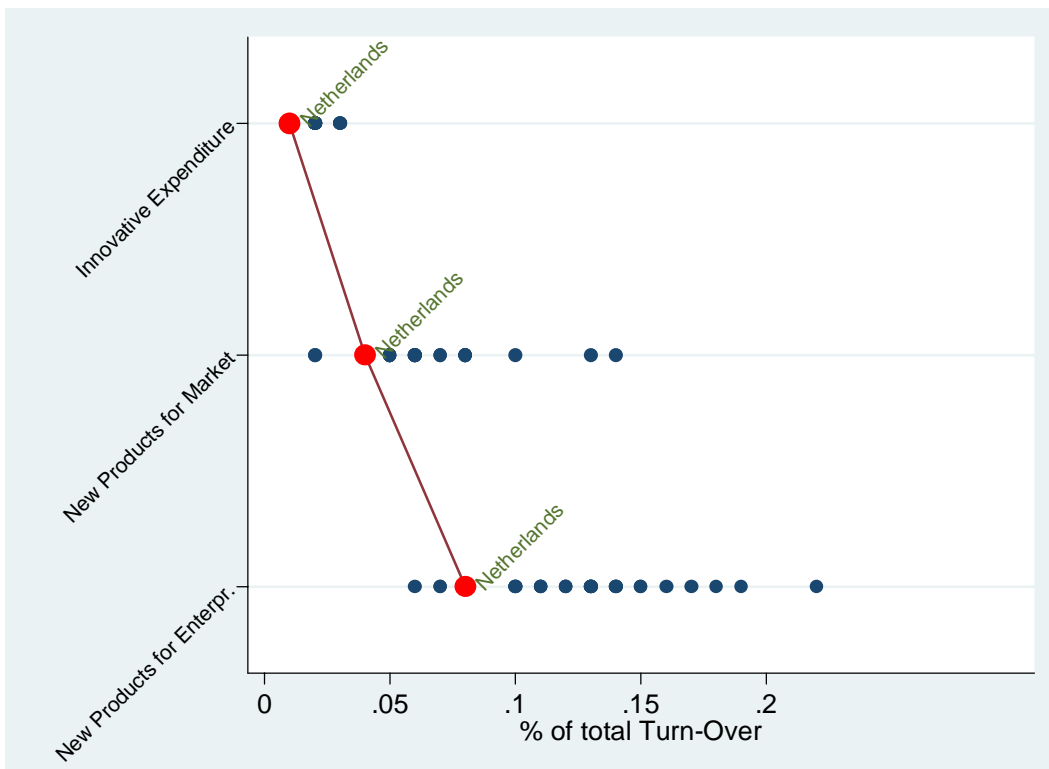
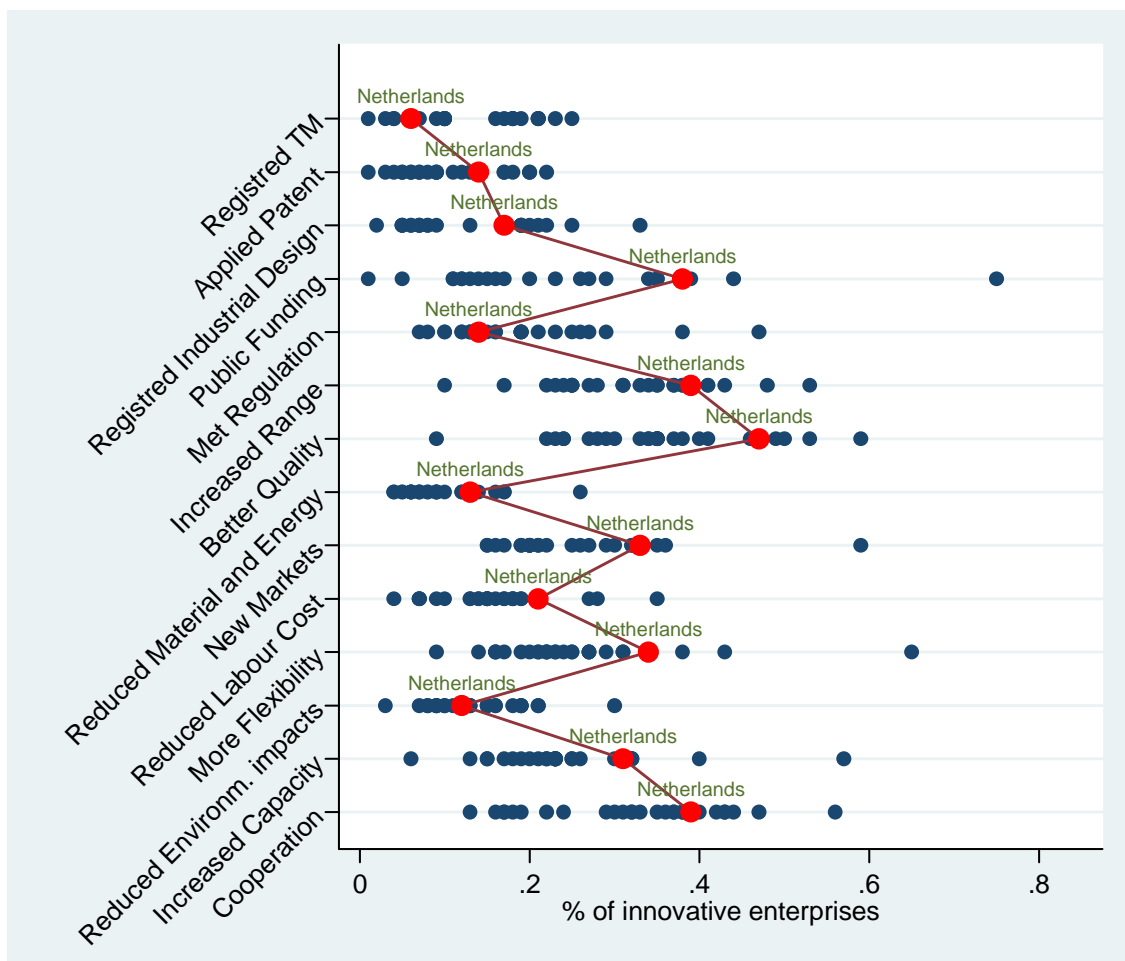


Figure 20.3



## **NORWAY (NO)**

### ***Overall Performance***

37 % of all enterprises in Norway have undertaken innovation activities in the course of 2002-2004. The percentage drops to 24 % for those that carried out organizational innovations. 44 % of these innovative active enterprises have raised public subsidies and 33 % have been participating in cooperation agreements with other firms/institutes.

Norway has somewhat low figures on innovation expenditure ( 1 % of total turnover) and share of newly introduced products in the total turnover ( 7 % and 2 % respectively). Concerning intellectual property rights, 17 % of all innovative enterprises have applied for a patent and 22 % have registered a trademark for the years 2002-2004.

24 % of all innovative enterprises reported that the “improved quality of goods and services” constituted an effect of “high degree” of the innovations introduced in the years 2002-2004. For 23 % of the innovators, the innovations led to an “increased range of goods and services”. Only 4 % of the innovative enterprises considered “reduced materials and energy per unit output” as an effect of “high degree”. “Reduced environmental impacts or improved health and safety” was also a rather infrequently quoted effect ( 8 % ). 21 % of the enterprises stated that they have improved employee satisfaction or reduced rate of employee turnover as a result of organizational innovations.

### ***Analysis by sector and size***

The positive relationship between the size and the innovative capacity of an enterprise is observed in the country. Accordingly, large enterprises innovate twice more than the small ones (63 % versus 32 %) and participate in cooperative agreements to innovate (58 % versus 29 %). However, the relationship is not remarkable for the indicators on innovation expenditures, share of newly invented products in the total turnover and public funding for innovation.

The services sector lags behind the manufacturing one with a score of 32% against 44%. The best performing branch of economic activity is computer related business where 66 % of all the enterprises have engaged in innovative activities, whereas the laggard is the transport sector with a record of 18 %.

Figure 21.1

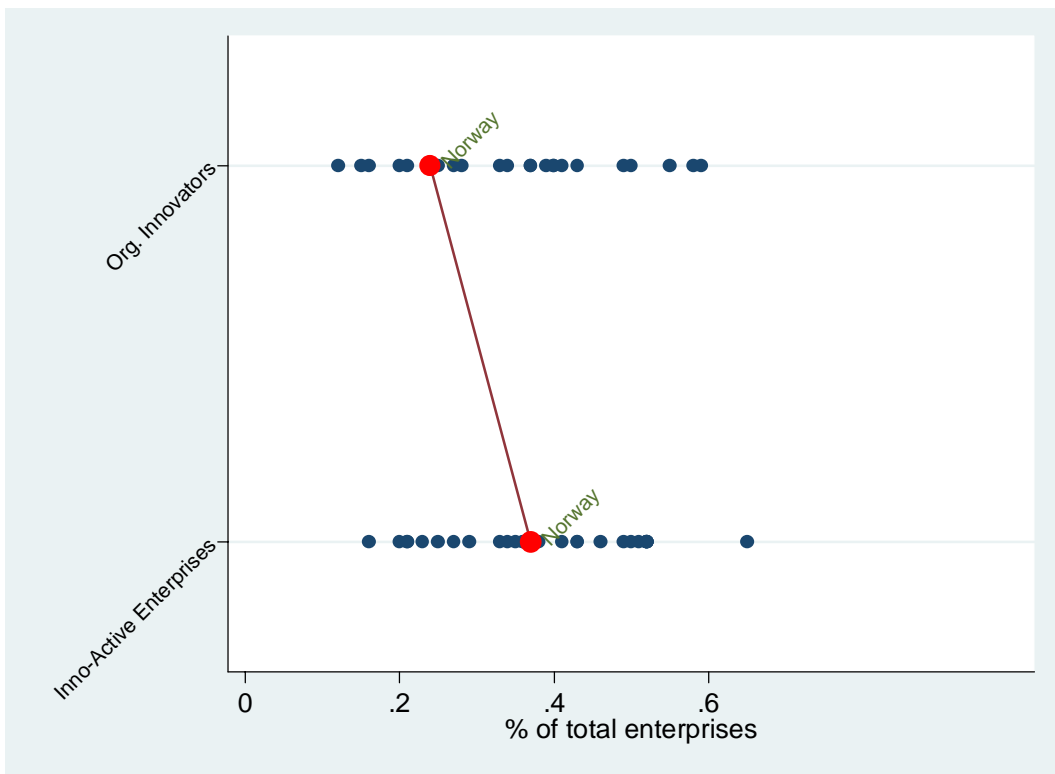


Figure 21.2

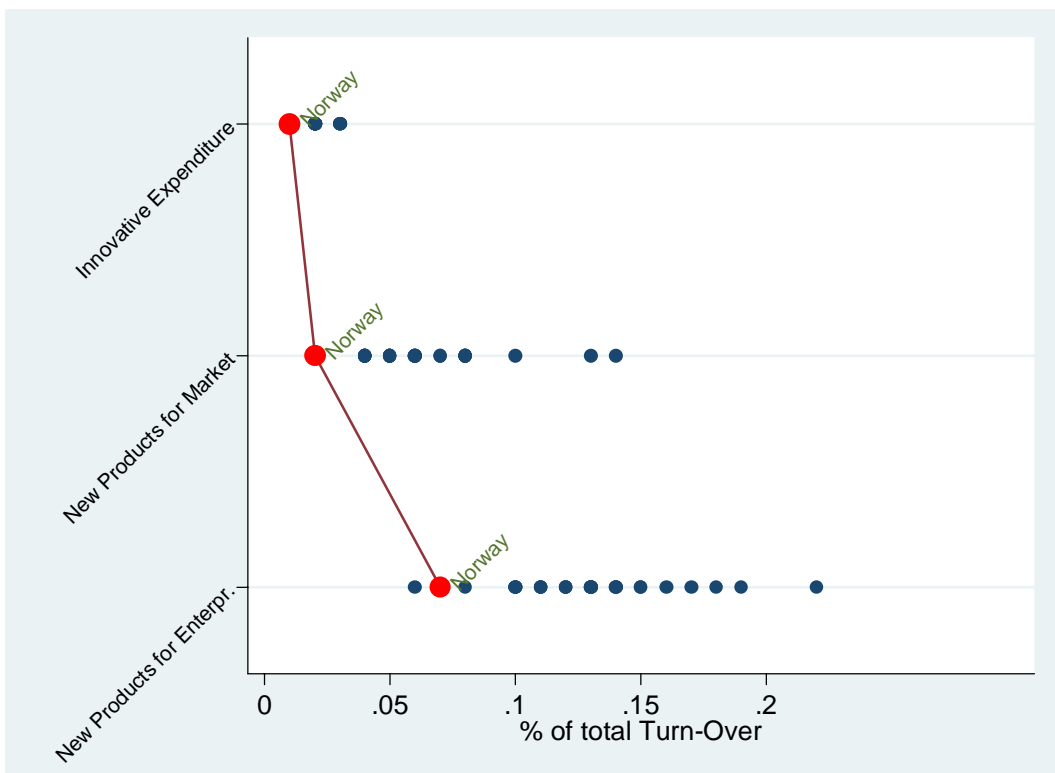
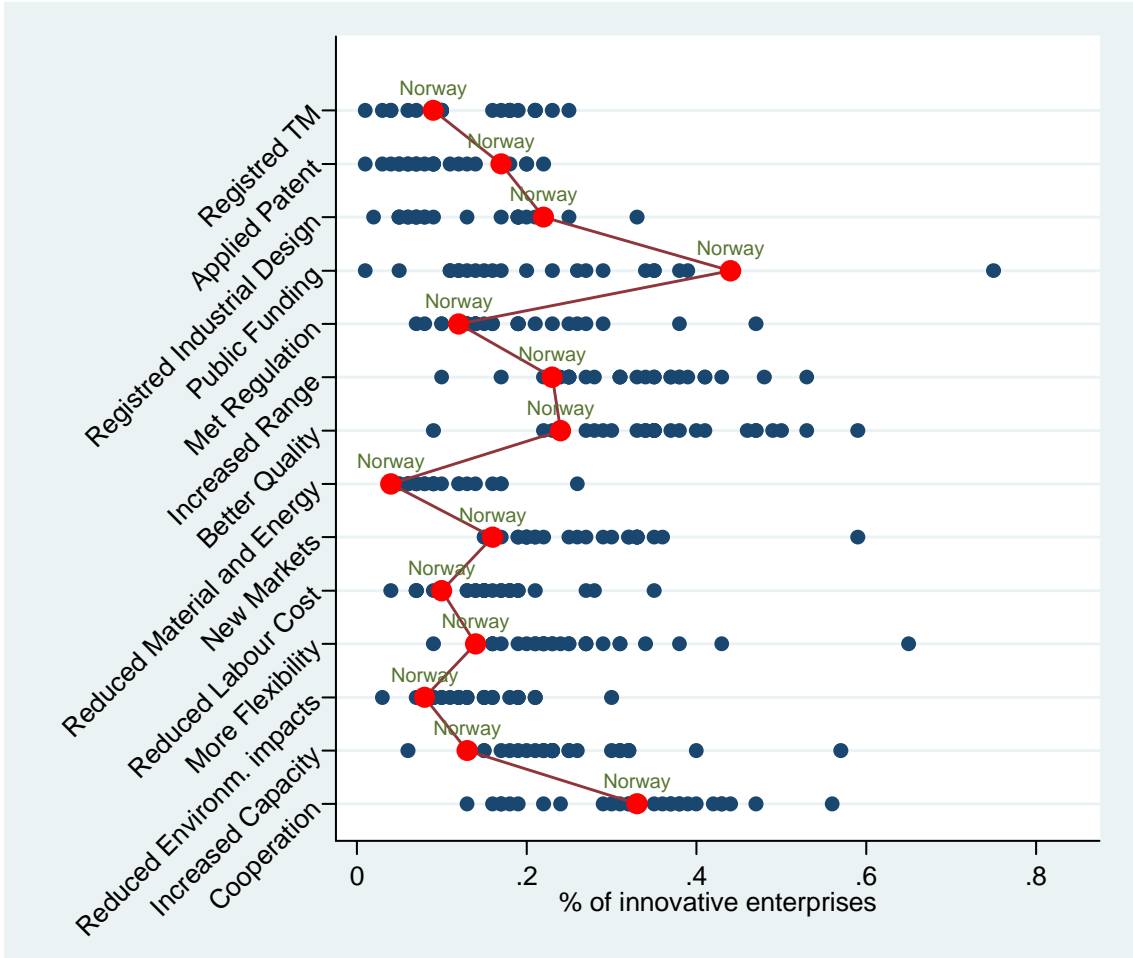


Figure 21.3



## **POLAND (PL)**

### ***Overall Performance***

Only one fourth ( 25 % ) of all enterprises have engaged in innovative activities in the course of 2002-2004 in Poland. The number is even lower (21 % ) for organizational innovations. Still, the country shows a promising innovation performance given the relatively high rates on innovation expenditure ( 2 % ), share of new products in the total turnover ( 13 % ) and share of products new to the market ( 8 % ).

In the years 2002-2004, 44 % of the enterprises with innovation activity participated in innovation cooperation with other institutions.

The major weaknesses of the country are on intellectual property rights and share of enterprises that received public funding. Only 5 % of all innovative enterprises have applied for a patent and 12 % of them have received public funds for innovation.

“Improved quality of goods and services” (35 %), “increased range of goods and services” ( 33 % ), “entering new markets or increasing market share” ( 27 % ) have been the most frequently quoted effects of innovation according to innovative firms. Unfortunately, the data on the effects of organizational innovation have a very poor quality; hence, it is not possible to end up with sensible analysis on this field.

### ***Analysis by sector and size***

The gap between the innovation performance of large and small enterprises is huge in Poland. Only 18 % of small enterprises have engaged in innovative activities while this ratio goes up to 39 % for medium-sized and 64 % for the large enterprises. The same gap is visible also in terms of the contribution of newly introduced products to the total turnover. 4 % of the total turnover of small enterprises in 2004 accounted for goods and services introduced in the period 2002-2004. In large enterprises this proportion amounts to 20 %, for the medium size enterprises it was 10 %. While small enterprises reserve hardly any resources for innovation, for larger enterprises this proportion reaches 2 % of the total turnover.

The manufacturing sector has a slightly better record than the services sector, with a record of 26 % versus 22 %. The best performing branch of economic activity has been financial intermediaries (43 %), while the back laggard is the transport sector (16 % ).



Figure 22.1

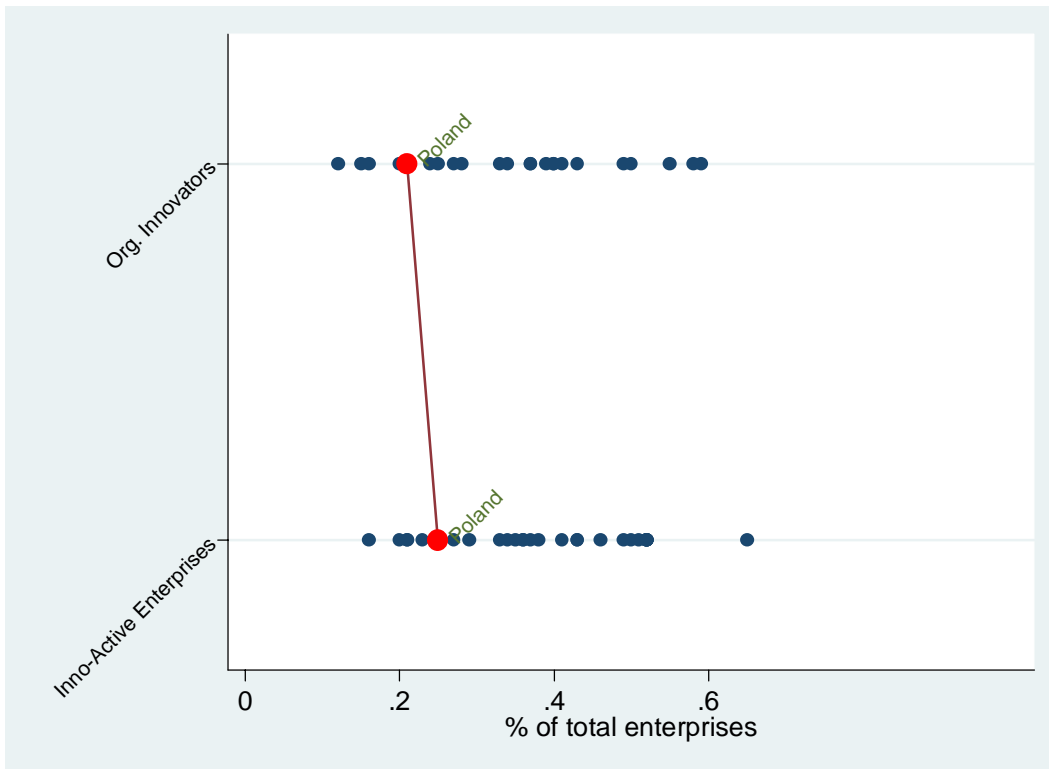


Figure 22.2

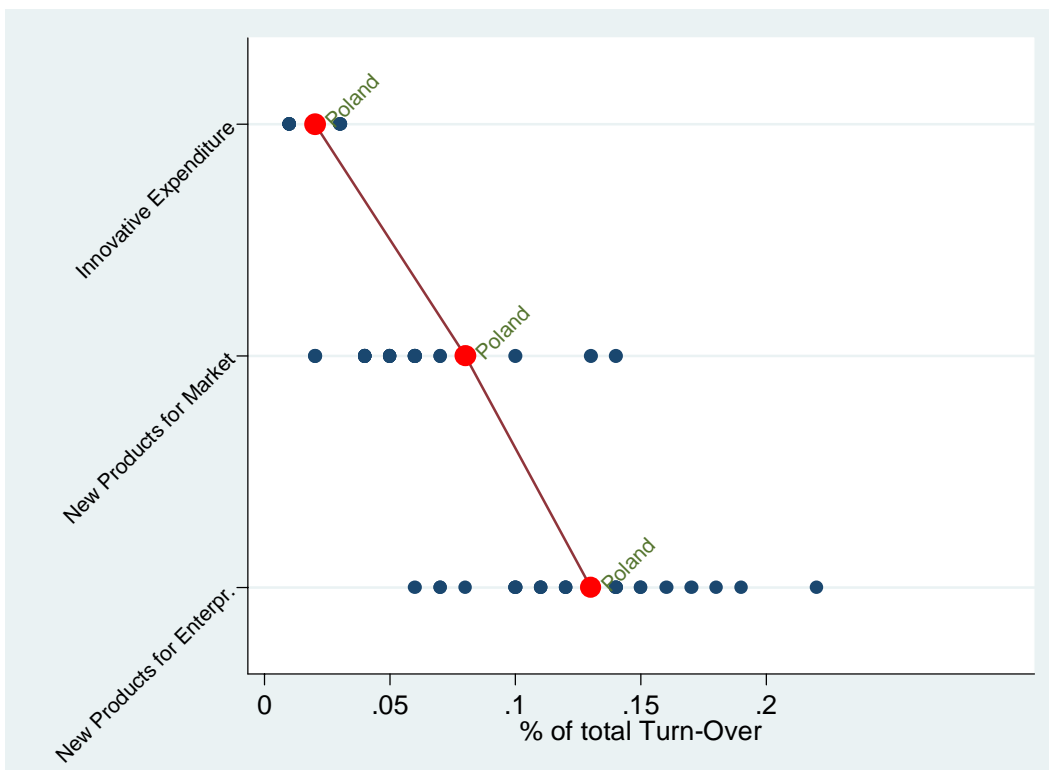
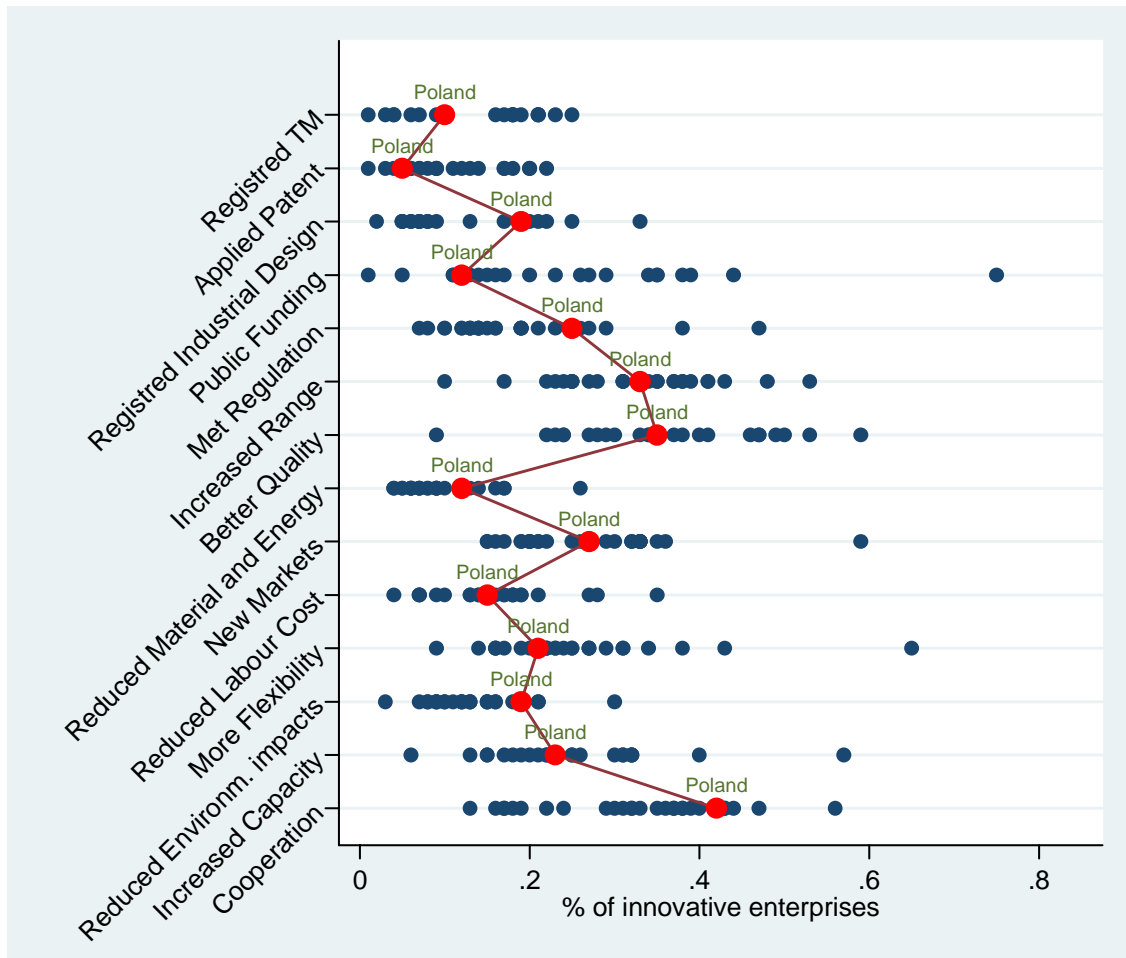


Figure 22.3



## **PORTUGAL (PT)**

### ***Overall Performance***

41 % of Portuguese enterprises were “innovation active” in the years 2002-2004. The same proportion holds for those that have undertaken organizational innovation. The contributions of the newly invented products have been 10 % for the products new to the firm and 4 % for the products new to the market.

The innovative performance of the country is weakened by the scarcity of resources kept for innovation, only 1 % total turnover. Similarly, the Portuguese firms are not receiving so high public funds ( 11 % ) or carrying on cooperative agreements (19 %). Concerning intellectual property rights, only 7 % of all innovative enterprises have applied for a patent and 19 % have registered a trademark for the given time horizon.

In terms of the highly important effects of innovation, the country has quite surprising results when compared to the rest of the countries participating in the survey. The most frequently quoted effect of innovations has been “reduced material and energy per unit output” (26 %) followed by “reduced labor costs per unit output” (18 %). “Increased capacity of production” (6 %), “improved quality in goods and services” , “improved flexibility of production or service production” (9 % each) have been rather infrequently mentioned effects, unlike the other countries.

### ***Analysis by sector and size***

In Portugal as well there is a positive relationship between the size of an enterprise and its propensity to innovate: 72 % of the large enterprises and 60 % of the medium-sized enterprises had innovation activities, whereas of the small enterprises only 36 % were innovation active.

Enterprises in the services sector are doing better in terms of innovative-activeness than manufacturing firms ( 44 % versus 39 % ). The best performing branches of economic activity are computer related business ( 75 % ), followed by financial intermediaries (54%) and transport (45%).

Figure 23.1

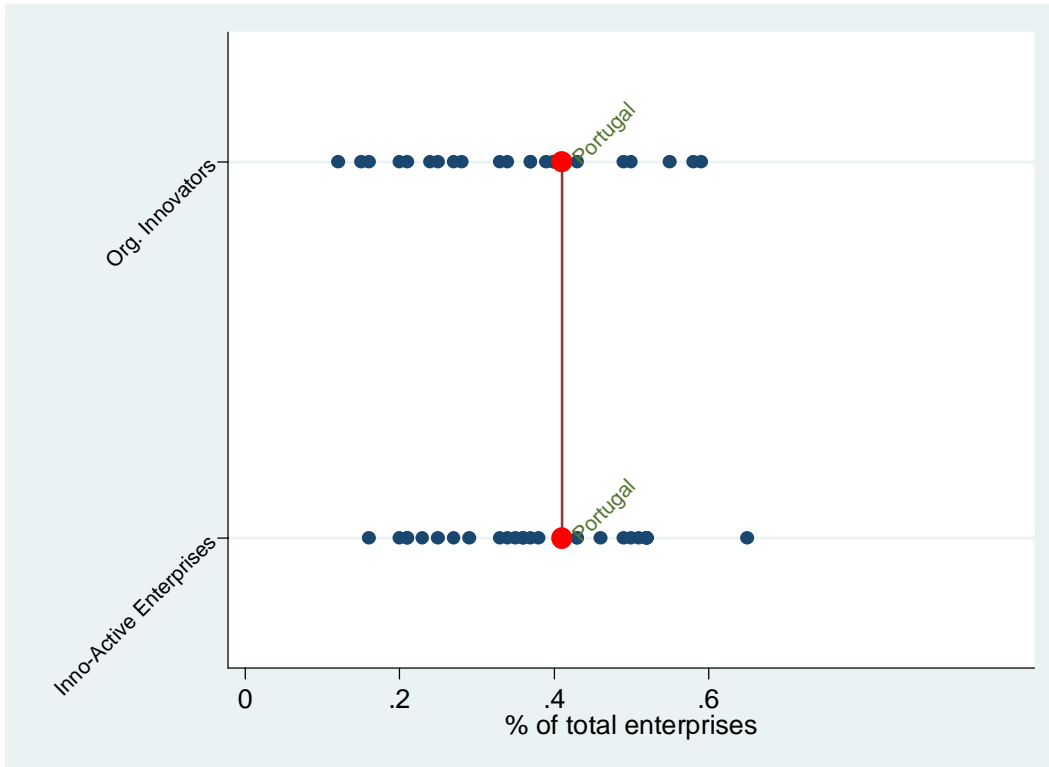


Figure 23.2

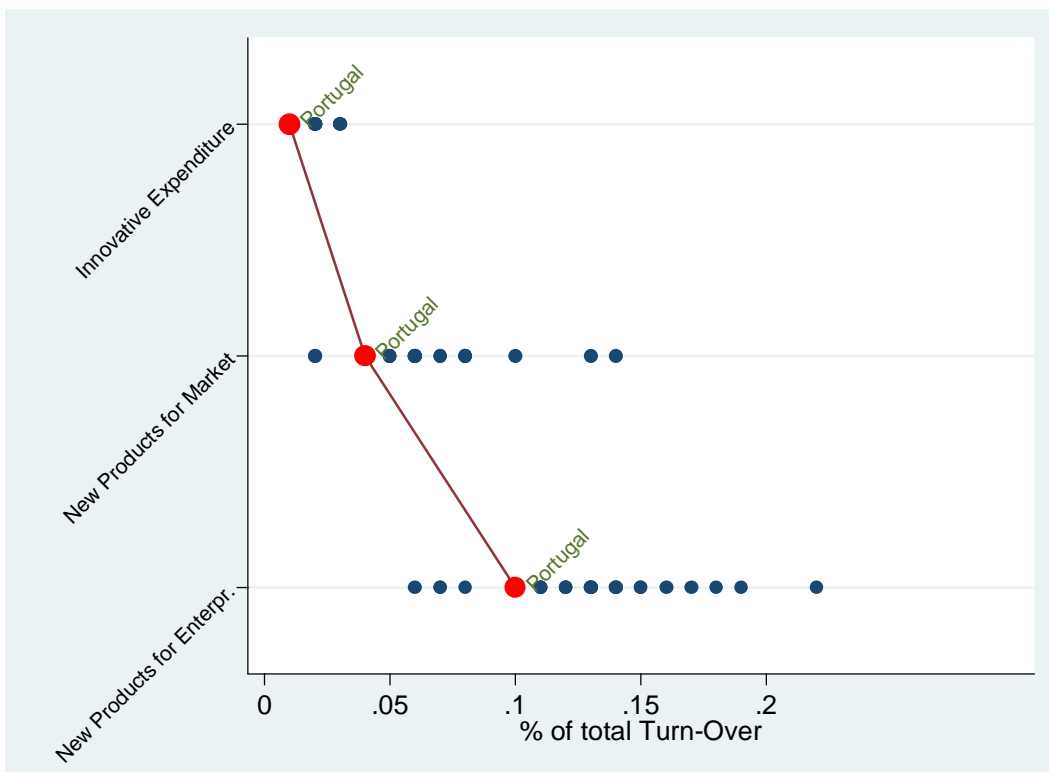
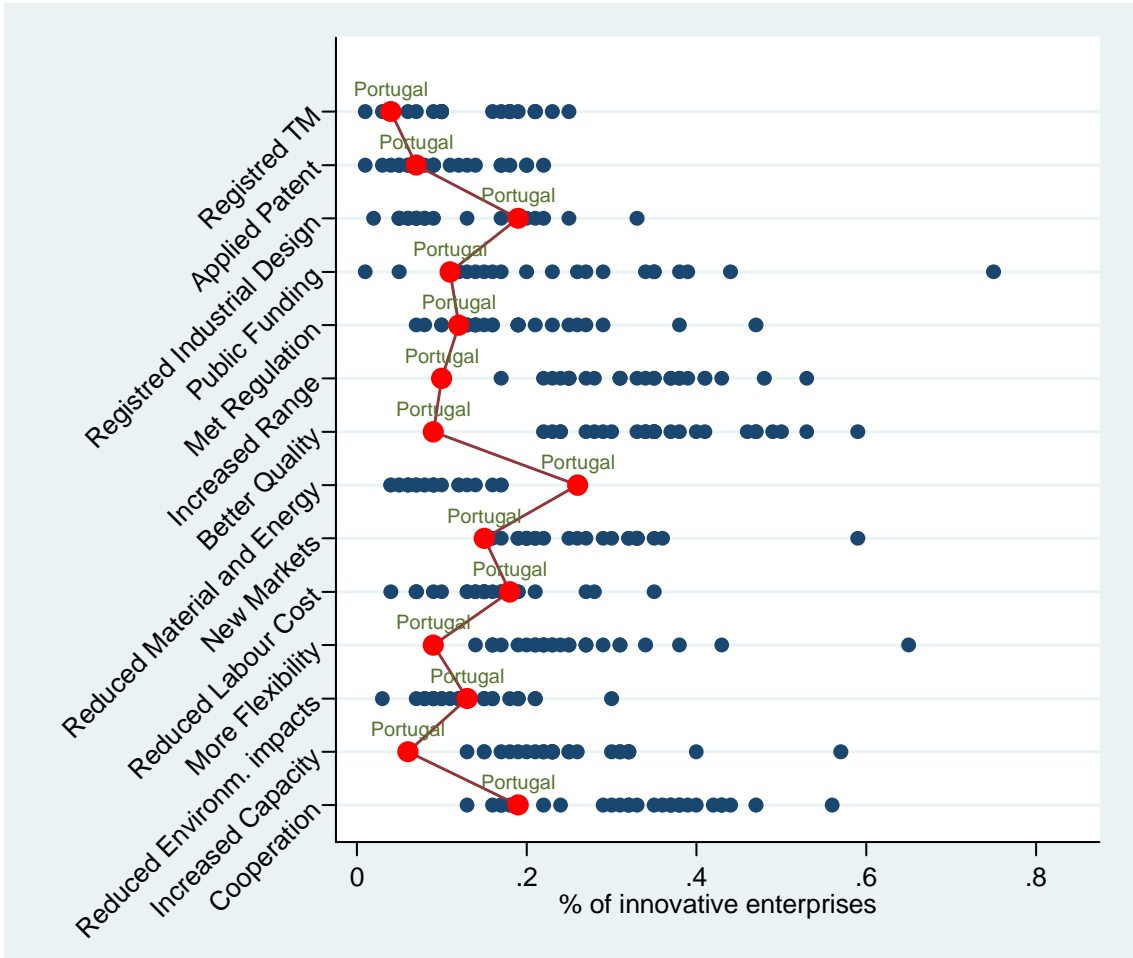


Figure 23.3



## Romania (ROM)

### ***Overall Performance***

In Romania just 20 % of total enterprises have been engaged in innovation activities and 16% of total enterprises introduced organizational innovation in the years 2002-2004. The enterprises recorded to spend 1.5 % of total turnover on innovation. The products new to firms make up 17 % of the total turnover; this number decreases to 7 % for the products new to the market. The share of the innovative enterprises that report cooperation with other enterprises and/or institutes throughout the course of innovation activities is 17% and the number of innovative firms declaring to have received any public funding is restricted to the 11% of the total.

For the 32 % of the innovative enterprises the innovations led to an “increased capacity of innovation or service production” and 29% of all innovative enterprises reported an “improved flexibility of production or service provision”. The rate of innovators that claimed to have “improved quality of their goods and services” is 37% and that quoted to have “entered in a new market or increased the market share” is 29%. The 18% of the innovative enterprises claimed to have “reduced the environmental impact” as result of innovation and 15% of the innovators claimed to have “reduced the labor cost per output unit”.

The share of enterprises applying for patent and intellectual property rights is restricted to the 7% of the total of innovative firms as well as the share of enterprises that registered trademarks.

### ***Analysis by sector and size***

The firm size has been recorded to have an effect on innovation activity in Romania: large firms do innovate more ( 42 % of total ) than medium-sized ( 24 % ) and the small ( 16 % ) enterprises. This trend is confirmed, but smoothed, for the percentage of enterprises that introduced organizational innovation: 28 % for large firms, 17 % for medium sized enterprises and 15 % for small firms. The effect still holds for innovation cooperation, with rates 28 % for large enterprises and around 16 % percent for small and medium enterprises.

In Romania, the proportion of enterprises with innovation activities is higher in the manufacturing sector ( 22 % ) than in the service sector ( 16 % ). The best performing branch of economic activity in terms of innovation intensity is the R & D (NACE73) with a record of 65%, followed by computer related business (NACE72 ) with 35%. The sector recording the lowest share of innovative enterprises is wholesale trade with a track of 14%.

Figure 24.1

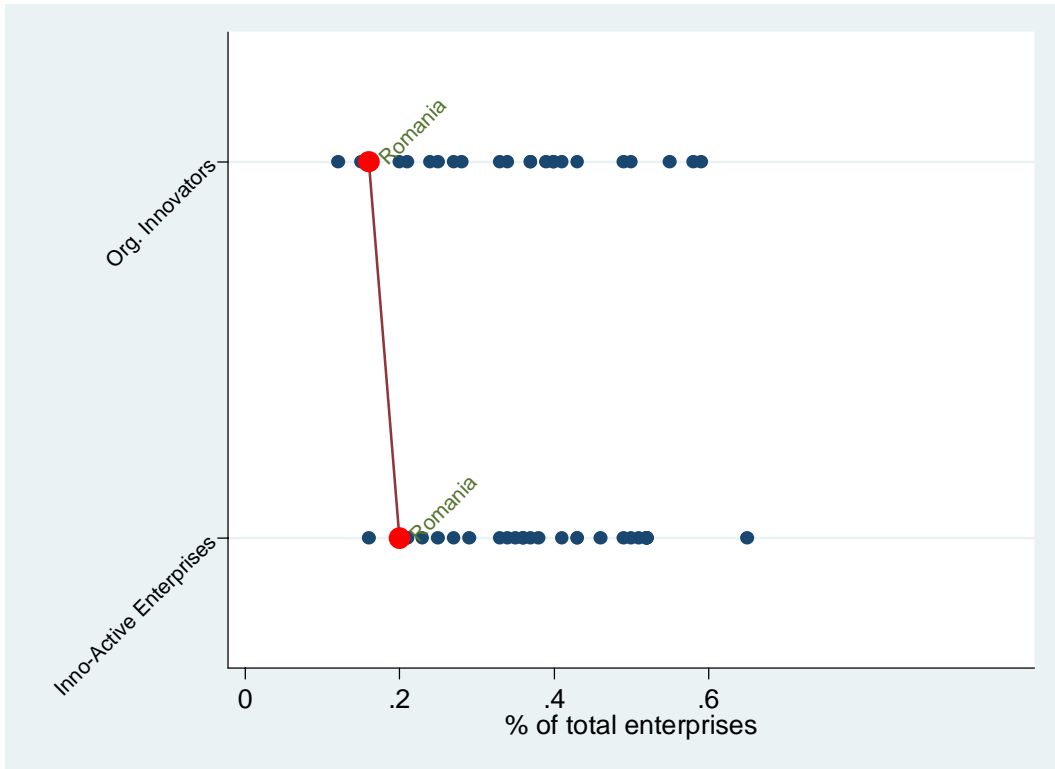


Figure 24.2

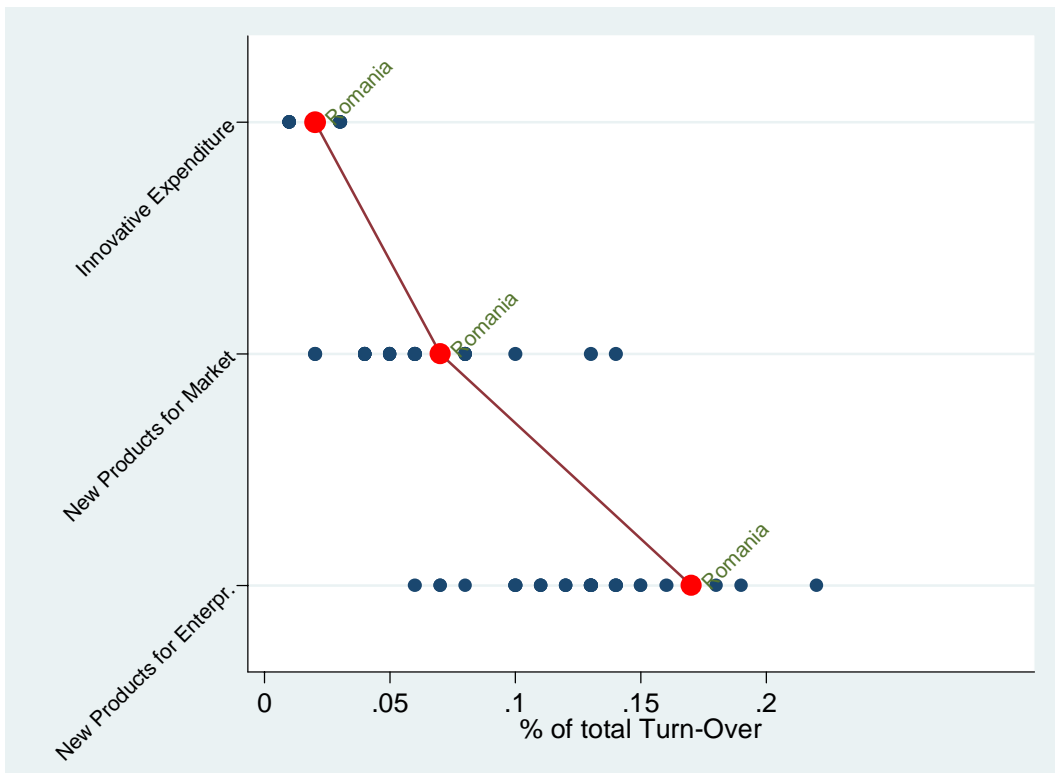
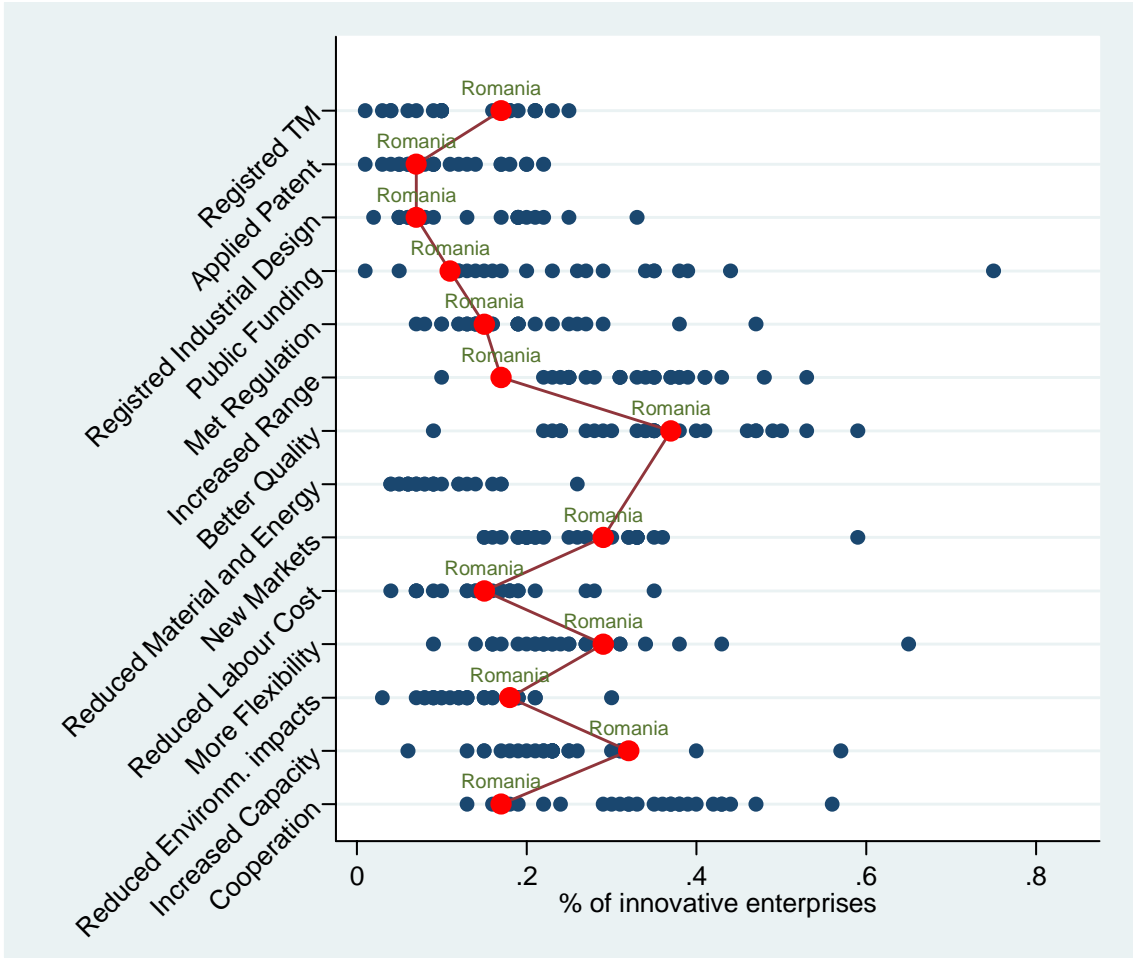


Figure 24.3





## **Slovakia (SVK)**

### ***Overall Performance***

In Slovakia, 23 % of total enterprises have been involved in innovation activities and 15% have introduced organizational activities. The enterprises recorded to spend almost the 2 % of total turnover on innovation. The products new to firms make up 19 % of the total turnover, and this percentage decrease to 13% for the products new to the market. The share of the enterprises that receive any public funding is contained just in the 12% of the total. The 38% of the innovative enterprises reported to have cooperated with other enterprises and/or institutes throughout the course of innovation activities.

More than one third (34%) of the innovative enterprises reported an “increased range of goods and services” as well as “improved quality in goods and services”. On other hand, 25 % of the innovation enterprises stated to have “entered new markets and/or increased market share” as result of innovation. Similarly, 27 % of the innovators claimed to have “improved flexibility of production or service provision” and 25 % of the innovative enterprises “increased capacity of production or service provision”. The reduction of the environmental impact as result of innovation is quoted by 16 % of the innovators and just 7 % recorded to have “reduced the cost of the labor per unit of output”.

The share of enterprises applying for patent and intellectual property rights is only 4% of the total of innovative firms, and the share of enterprises that registered trademarks are solely 7%.

### ***Analysis by sector and size***

The firm size has the expected effect on innovation activity in Slovakia: large firms do innovate more ( 58 % of total ) than medium-sized ( 34 % ) and the small ( 16 % ) enterprises. This effect is reflected also in the innovation expenditures with large firms ( 2% ) spending twice than medium sized ( 1% ) and small firms ( 0.7% ). The dependency holds for innovation cooperation, with rates of 57 % for large enterprises, 37% for medium firms and 31% for small sized enterprises. The size effect is dramatically strong for the share of enterprises that applied for patents: while the percentage of large firms is around 10%, the share of medium and small size enterprises applying for a patent has only reached 2%.

In Slovakia, the proportion of enterprises with innovation activities is higher in the manufacturing sector ( 27 % ) than in the service sector ( 17 % ). The best performing sector in terms of innovation intensity is R & D (NACE73) with a record of 72%, followed by the computer related business sector (NACE72) with 55% and the financial intermediaries sector (NACE J) with 44%. The sector recording the smallest share of innovative enterprises is the trade sector with a track of 10%.

Figure 25.1

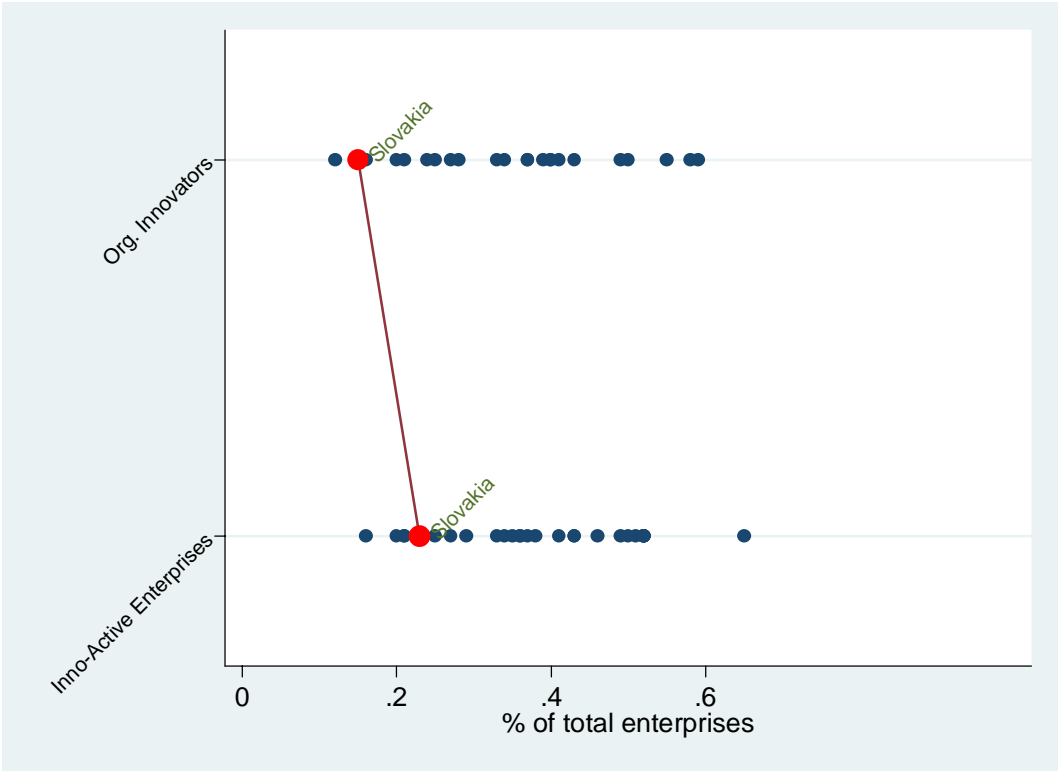


Figure 25.2

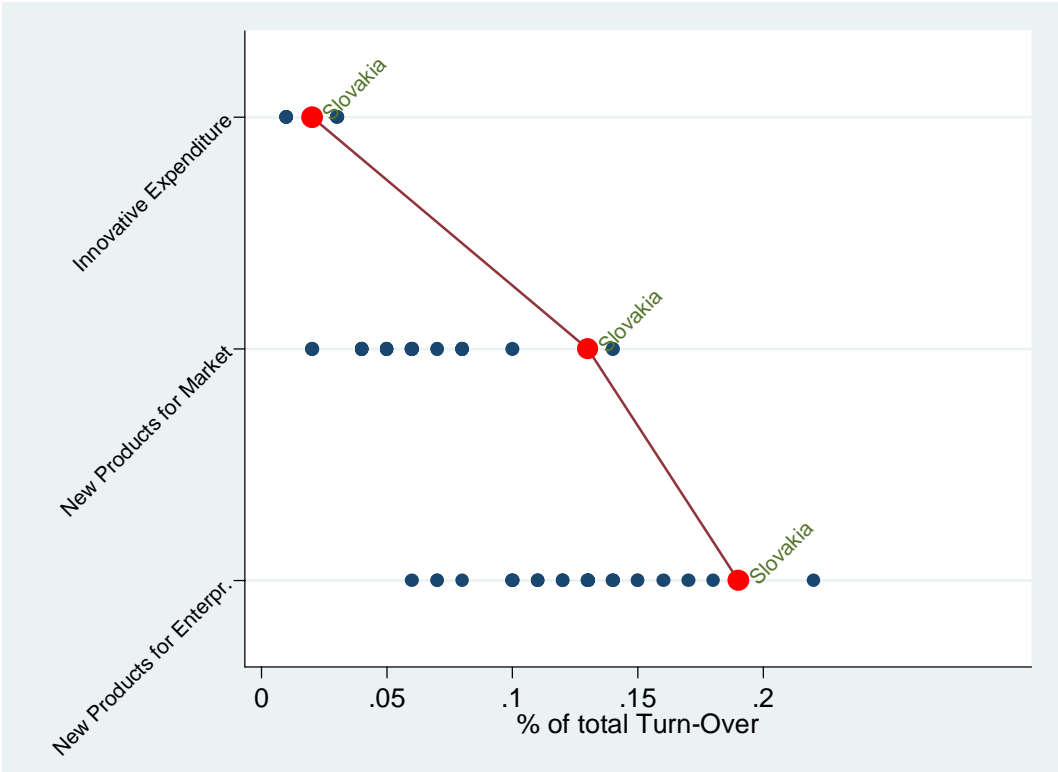
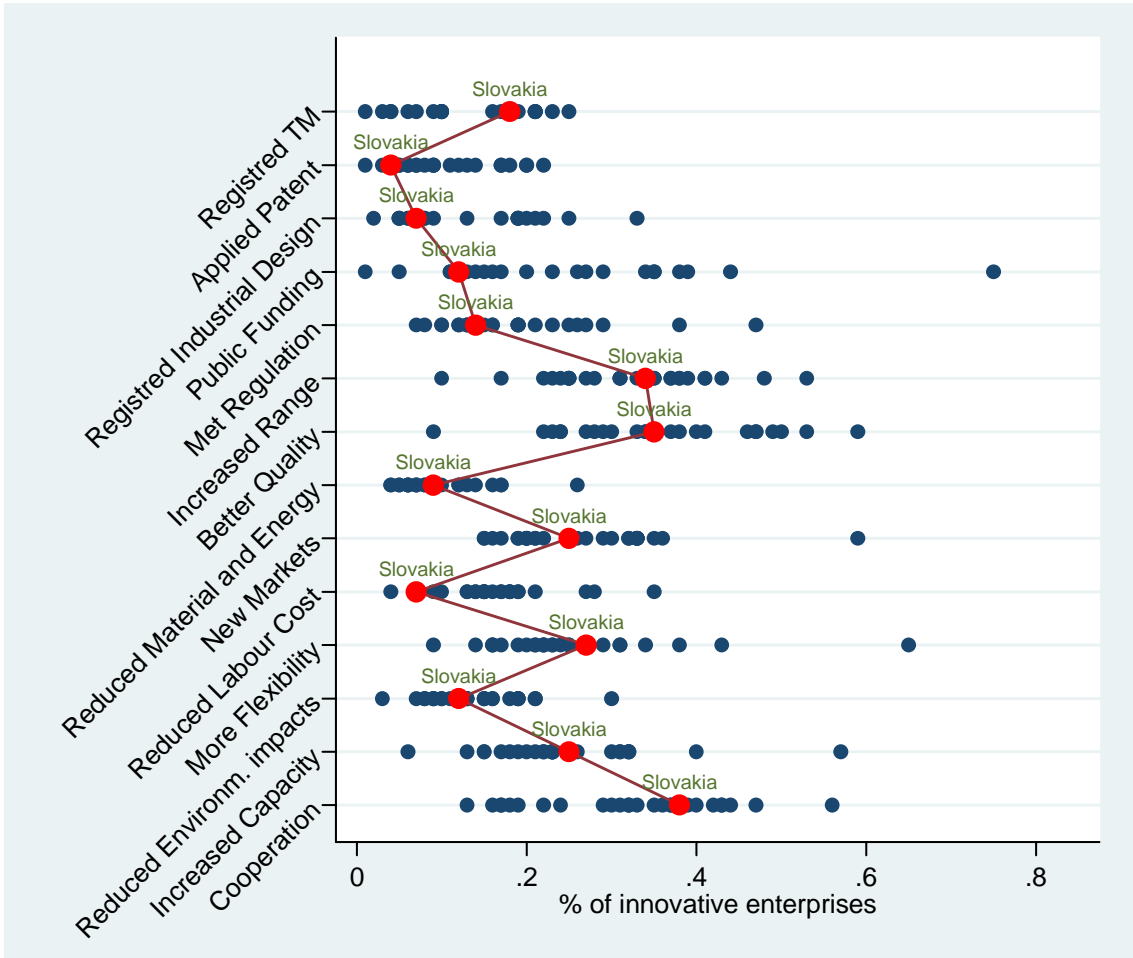


Figure 25.3



## **Slovenia (SVN)**

### ***Overall Performance***

The 27 % of Slovenian enterprises have engaged in innovation activities during the period 2002-2004. In particular the products new to firms make up 14 % of the total turnover, this number decreases to 7 % for the products new to the market. The share of innovative enterprises engaged in any kind of cooperation activities is remarkable with the 47% of the total.

Exactly half of the enterprises reported an “improved quality in good and services” effect as result of innovation. Similarly, almost one third (32%) of the innovative firms “entered in a new market or increased their market share”. A comparable proportion is recorded for the enterprises that “increased the range of good and services” (38%). For the 31 % of innovative enterprises the innovations led to an “increased capacity of innovation or service production” and the same percentage is reported by firms regarding “improved flexibility of production or service provision”. Almost the 28% of the innovative enterprises reported to have “reduced labor cost per unit of output” as result of innovation. The 19% of the innovative enterprises claimed also to have reduced the environmental impact and 17% of the innovators reduced materials and energy per unit of output.

Unfortunately, the indicators on intellectual property rights and registered trademarks are not available for Slovenia.

### ***Analysis by sector and size***

The firm size has a strong effect on innovation activity in Slovenia: large firms do innovate more ( 70 % ) than medium-sized ( 41 % ) and the small ( 19 % ) enterprises. This trend is confirmed for enterprises that introduced new products to the market: large firms (20%) and medium sized enterprises (12%) recorded results much higher than small firms (4%). This effect holds also for innovation cooperation, with rates of 66 % for large enterprises, around 52% for medium sized firms and 38% for small firms. The size effect is then smoothed for the share of enterprises that increased the capacity of production and service provision: 35% for large enterprises and around 31 for small and medium sized firms.

In Slovenia, the proportion of enterprises with innovation activities is higher in the manufacturing sector ( 35 % ) than in the service sector ( 16 % ). The best performing sector in terms of innovation intensity is R & D (NACE73) with a record of 57%. The sector recording the smallest share of innovative enterprises is the trade sector (10%).

Figure 26.1

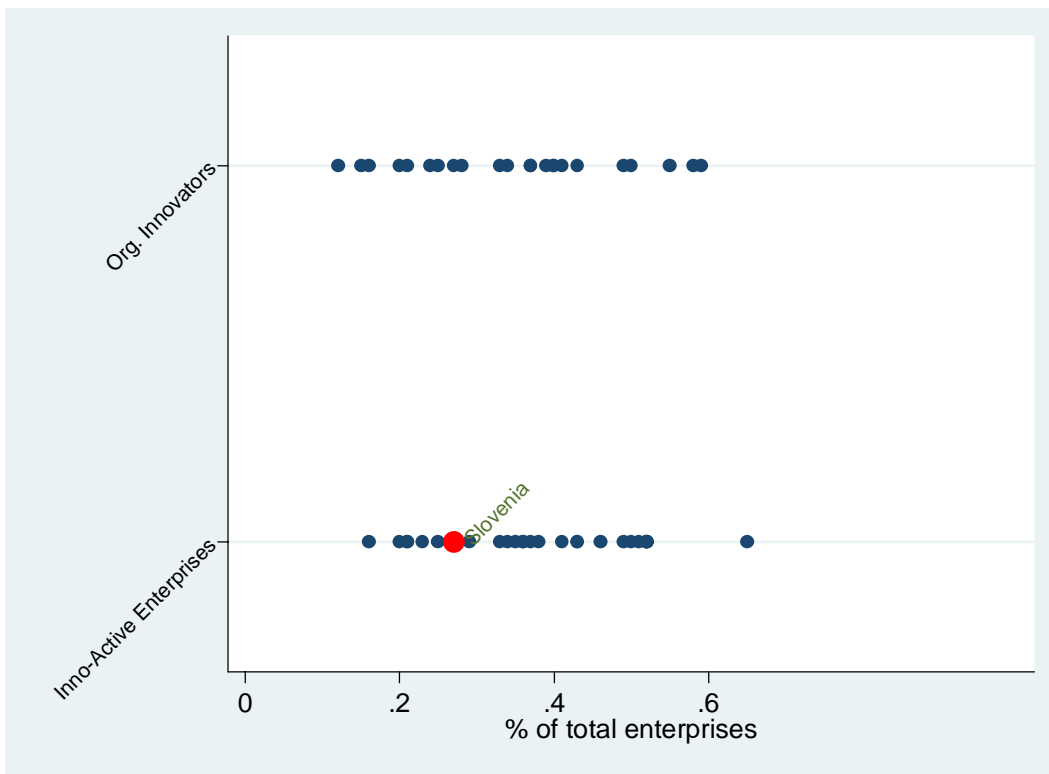


Figure 26.2

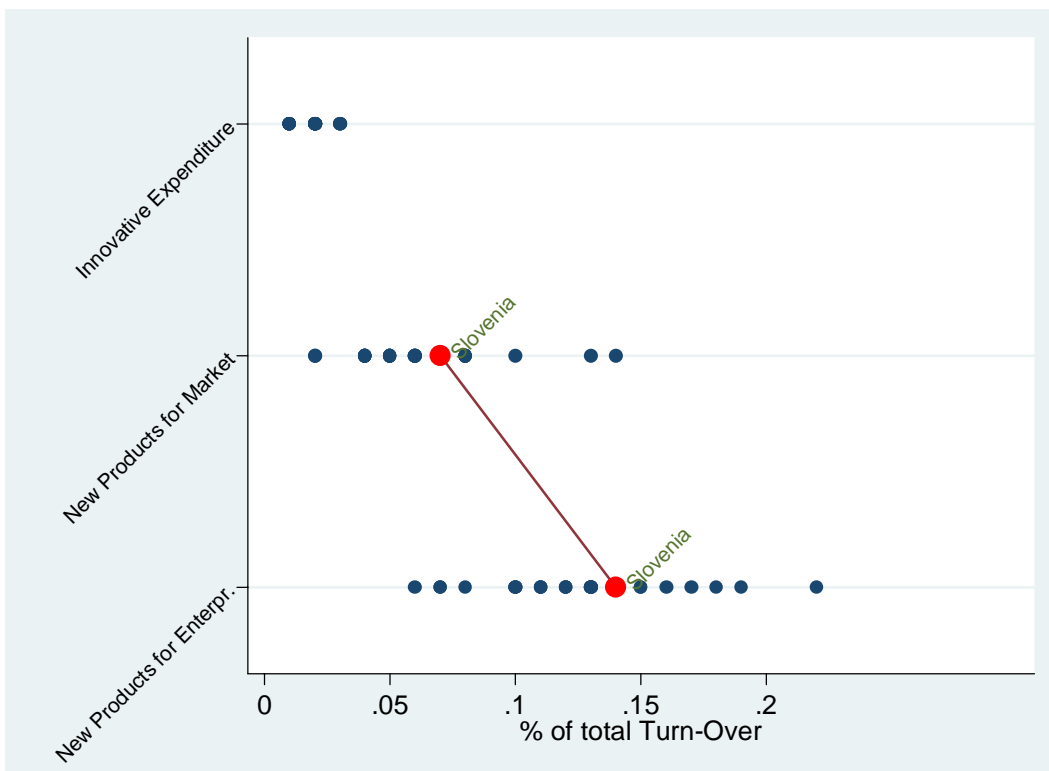
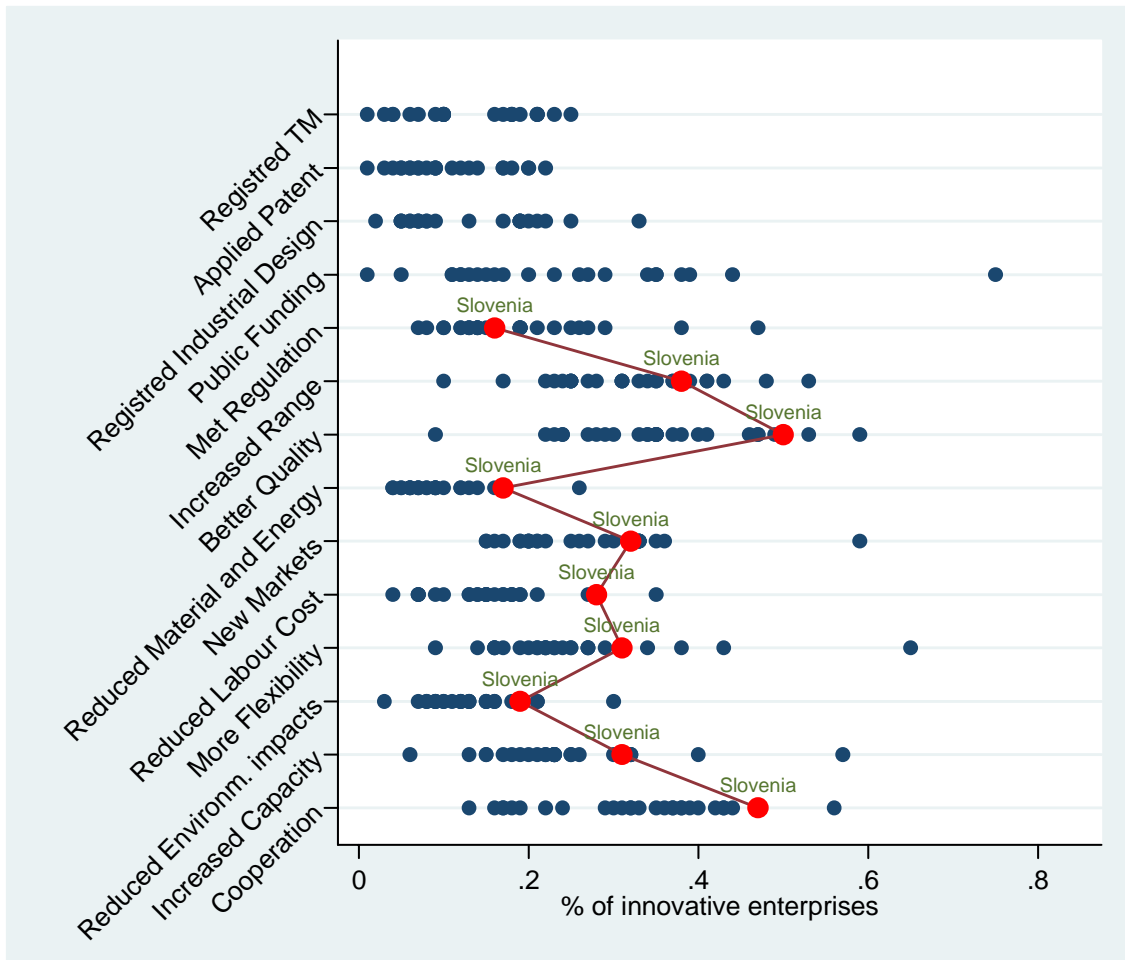


Figure 26.3



## **Sweden (SWE)**

### ***Overall Performance***

According to main results of the Community Innovation Survey, in Sweden 50% of the enterprises were involved in innovative activities in the years 2002-2004. The enterprises recorded to spend more than 3 % of their total turnover on innovation which constitutes an impressive performance. The products new to firms make up 13 % of the total turnover, this percentage decreases to 8% for the products new to the market. The 43% of the innovative enterprises reported to have cooperated with other enterprises and/or institutes throughout the course of innovation activities.

Almost one third (31%) of the Swedish innovative enterprises reported that the “increased range of good and services” constituted an effect of “high degree” of the innovations introduced in the years 2002-2004. For 29% of the innovators, the innovations led to “improved quality of good and services “. Only 7% of the innovative enterprises considered “reduced the cost of the labor per unit of output” as an effect of “high degree”.

Unfortunately, the indicators on intellectual property rights and registered trademarks are not available for Sweden.

### ***Analysis by sector and size***

The firm size has a strong effect on the Swedish innovation activity: large firms do innovate more ( 78 % of total ) than medium-sized ( 67 % ) and the small ( 45 % ) enterprises. This effect is reflected also in the innovation expenditures where large firms (4%) spend twice than medium sized and small firms (2%). The firm size effect still holds for innovation cooperation, with rates 69 % for large enterprises, 50% for medium firms and 38% for small sized enterprises, but it is definitely smoothed for the remaining indicators where only minor differences are recorded.

In Sweden, the proportion of enterprises with innovation activities is higher in the manufacturing sector ( 55 % ) than in the service sector ( 46 % ). The best performing sector in terms of innovation intensity is the financial intermediaries (NACE J) with a record of 67% followed by computer related business (NACE72) with 64 %. The sector recording the lowest proportion of innovative enterprises is the transport sector with a track of 23%.

Figure 27.1

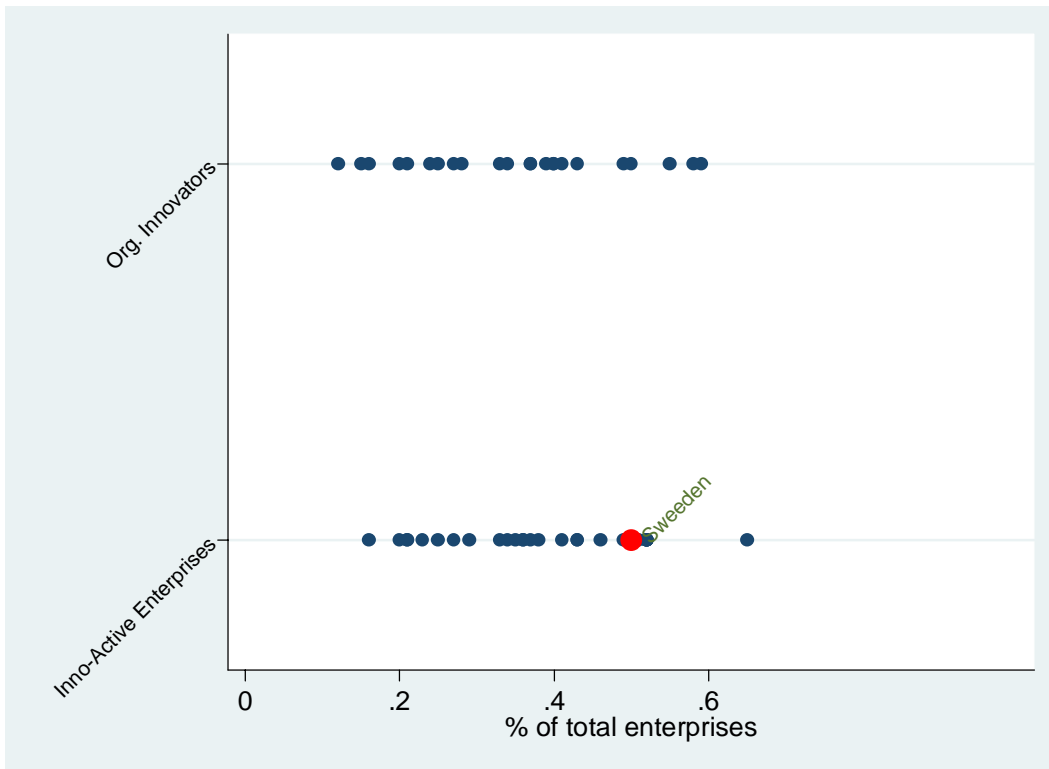


Figure 27.2

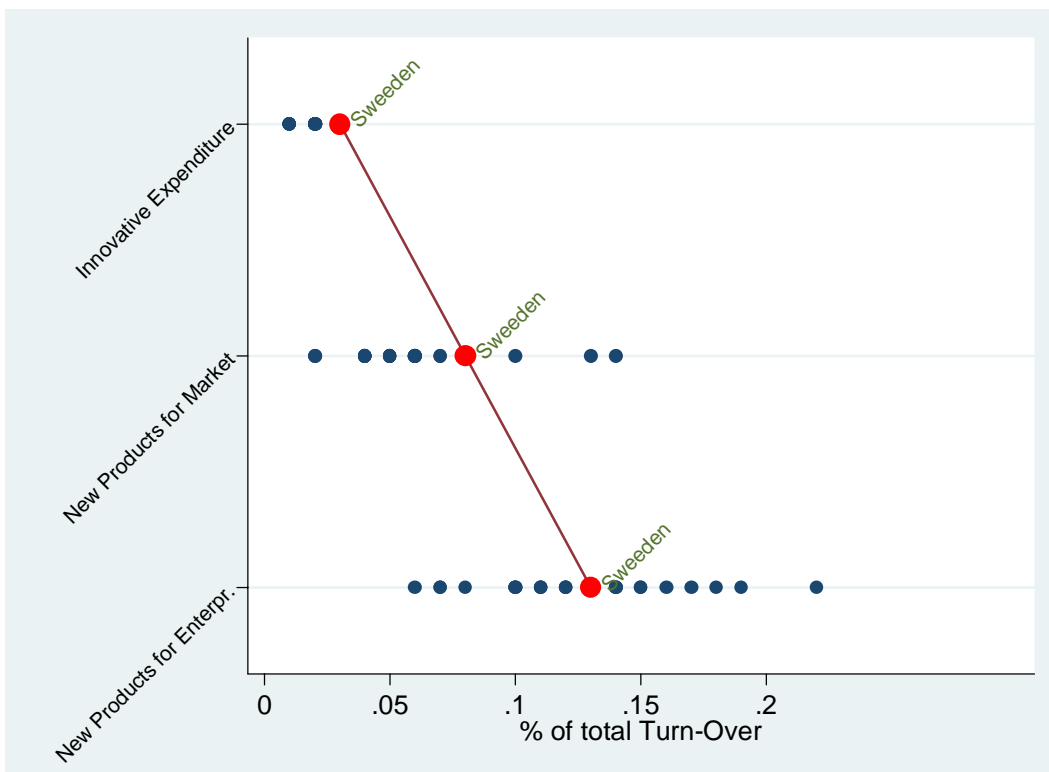
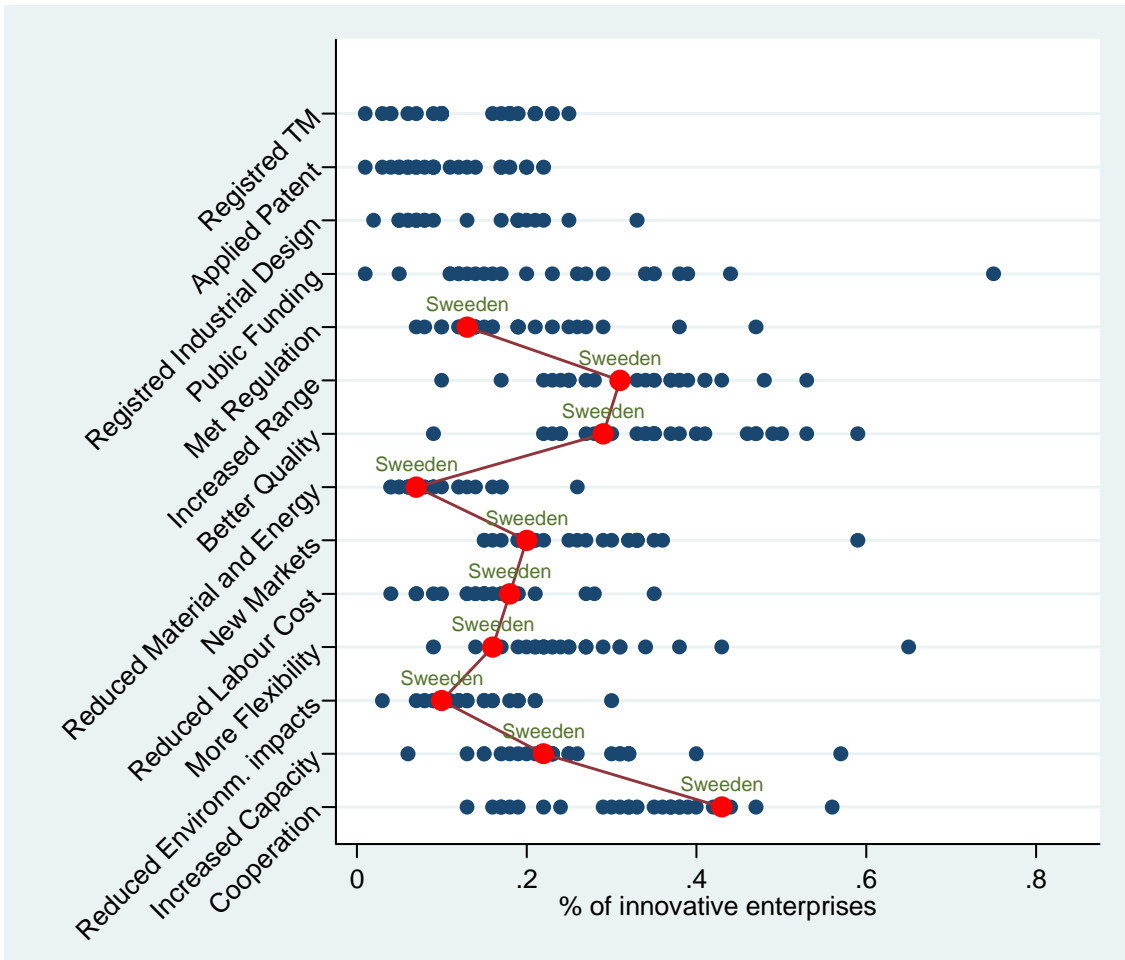




Figure 27.3



## **United Kingdom (UK)**

### ***Overall Performance***

In the United Kingdom, 43 % of total enterprises have been involved in innovation activities. The products new to firms make up 14 % of the total turnover, this number decreases to 6 % for the products new to the market. Almost 31% of the innovative enterprises reported to have cooperated with other enterprises and/or institutes throughout the course of innovation activities.

Concerning frequently referred highly important effects of innovation, 41 % of the innovators claimed to have “improved quality of their goods and services” and 36% of the innovative enterprises quoted to be “entered in a new market” as well as to have “increased the range of good and services”. On the other hand, only 16% of the innovative enterprises claimed to have “reduced the environmental impact” as result of innovation.

Unfortunately, the indicators on intellectual property rights and registered trademarks, as well as innovation expenditures and public subsidies for innovation are not available for the United Kingdom.

### ***Analysis by sector and size***

The firm size has the expected effect on innovation activity in United Kingdom as well, even if this effect is less strong than in other countries: large firms do innovate more ( 63 % of total ) than medium-sized ( 53 % ) and the small ( 40 % ) enterprises. The dependency holds for innovation cooperation, with rates of 43 % for large and around the 30 % for small and medium enterprises. However, the percentage of new products to the market is higher for small (7%) and large (8%) firms than for the medium sized (3%) enterprises. This trend is then confirmed for the share of enterprises that increased the range of goods and services: 34% for large enterprises and around 37 for small and medium sized firms.

In the United Kingdom, the proportion of enterprises with innovation activities is only slightly higher in the manufacturing sector (43 %) than in the service sector (42 %). The best performing sector in terms of innovation intensity is the computer related business (NACE72) with a record of 72%. The sector recording the smallest share of innovative enterprises is transport with a track of 28%.

Figure 28.1

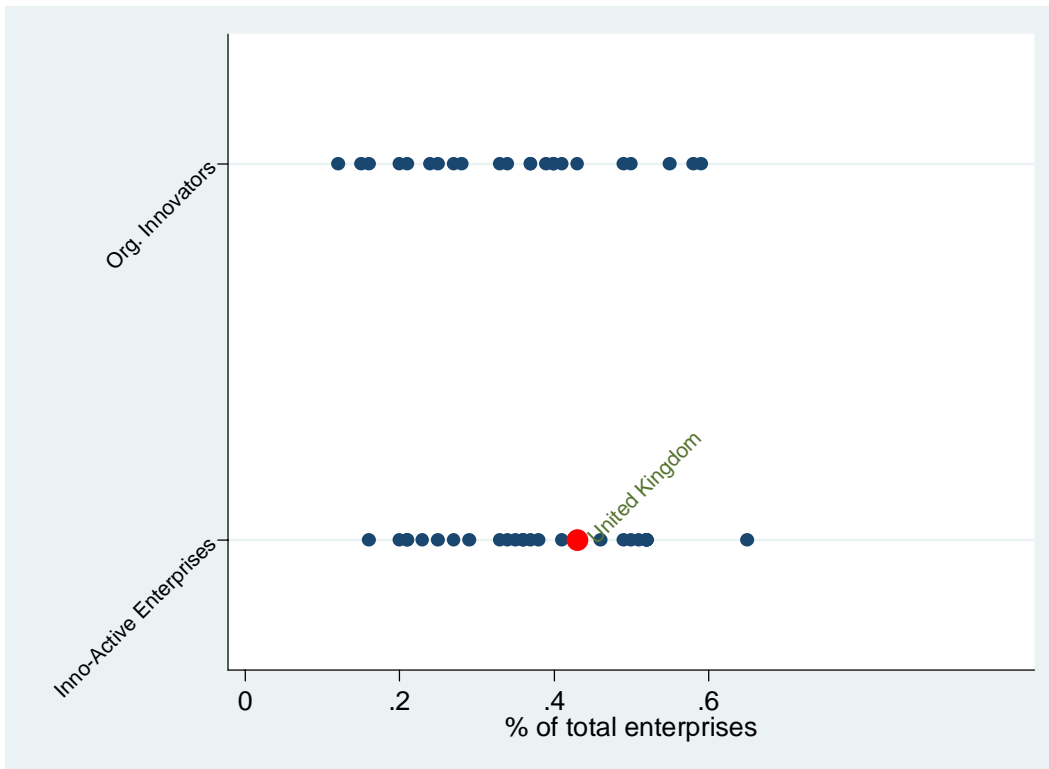


Figure 28.2

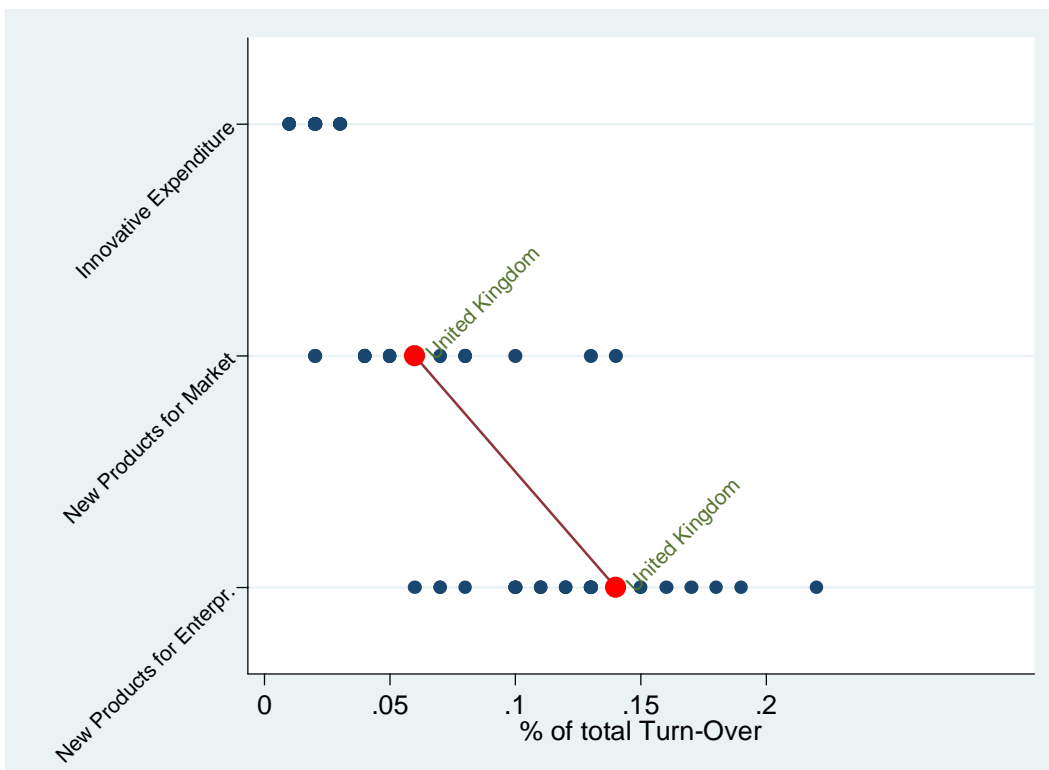
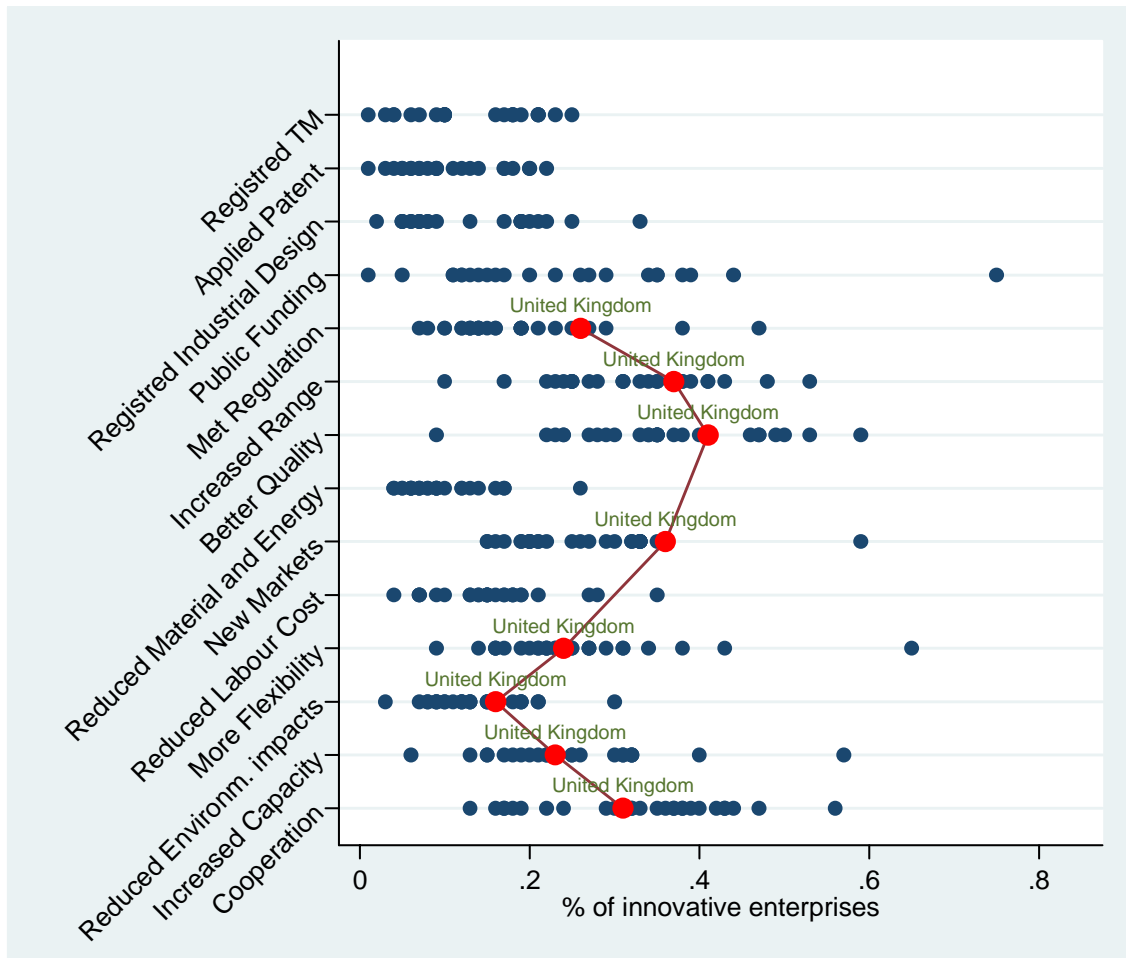


Figure 28.3



European Commission

**EUR 22799 EN – Joint Research Centre**

Title: Fourth European Community Innovation Survey: Strengths and Weaknesses of European Countries

Author(s): Funda Celikel-Esser, Stefano Tarantola and Massimiliano Mascherini

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**Abstract**

This report provides detailed profiles for the EU and some EFTA countries as regards to innovation. The data for analysis are obtained from the recent European Community Innovation Survey, whose results have been released in December 2006. This has been the fourth Community Innovation Survey ( CIS hereby on ) so far, one of the two main instruments together with the European Innovation Scoreboard (EIS) to gather data on innovation indicators and assess national innovation performance. The CIS is designed to obtain information on innovation activities within enterprises, as well as various aspects of the process such as the effects of innovation, sources of information used, costs etc. The CIS-4 survey has been realized in around 30 European countries plus some non-European countries. The structure of the report is as follows: depending on the data availability, for each country a three step analysis is provided: the first part summarizes the general profile of the country on innovation, then the second part focuses on the economic sectors and firm sizes within each country, finally a graphical representation of the general profile of the country is given.

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